

Request for Proposal

City of Fort Lauderdale

City of Fort Lauderdale P25 Radio Communication System Refresh-Replacement – Rebid – RFP # 549

RFP # 549

December 18, 2025

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Use or disclosure of this proposal is subject to the restrictions on the cover page.
Motorola Solutions

December 18, 2025
City of Fort Lauderdale
Procurement Services Division
100 N. Andrews Avenue, Suite 619
Fort Lauderdale, FL 33301
Attn: Laurie Platkin, Senior Procurement Specialist

Subject: RFP No. 549 - P25 Radio Communications System Refresh – Replacement - Rebid

Dear Ms. Platkin:

Motorola Solutions, Inc. (Motorola) is pleased to present the City of Fort Lauderdale with the following proposal to support your RFP No. 549 for a P25 Radio Communications System Refresh - Replacement - Rebid. We thank you for the opportunity to continue working with the City on its communication needs and are confident that the fully integrated P25 solution will meet the high standards and expressed needs of the City today and into the future. We understand the City's needs as outlined in the RFP are vital to protecting the personnel and communities in which they serve. The proposed P25 Radio System Project is critical to the security and operation of Fort Lauderdale's Public Safety Communication System and the implementation of Motorola's proposal will exceed the requirements of the Request for Proposal. Motorola will use the latest technology to significantly improve the response and coverage of the system to provide increased coverage, redundancy, reliability, and functionality. Key components of our proposal include:

- Four-site RF design providing enhanced coverage to meet and exceed each aspect of the RFP's coverage requirements
- A core and DSR core to provide Fort Lauderdale with the security and resilience your First Responders need
- Long-term maintenance and lifecycle services to ensure your P25 is protected and maintained into the future

This proposal is subject to Motorola's RFP responses, and it will be subject to the terms and conditions of the attached Master Customer Agreement (MCA) including its addenda and Exhibits, or alternatively, a negotiated version thereof. This proposal shall remain valid for a period of 180 days from the date of this proposal. Motorola would be proud to continue the relationship and strengthen the partnership we have with the City through the implementation of the proposed Radio System upgrade. Alternatively, Motorola would be pleased to address any concerns you may have regarding this proposal. Any questions the City of Fort Lauderdale may have may be directed to Jason Weihrich, Executive Account Manager, at (561) 339-5733 or jason.weihrich@motorolasolutions.com. Our goal is to provide the City of Fort Lauderdale and its Public Safety team with the best products and services available in the communications industry. We thank you for the opportunity to present our proposed solution, and we hope to strengthen our relationship by implementing this project.

Sincerely,

Motorola Solutions, Inc.

Danny Sanchez

MSSSI Territory Vice President, Florida

North America Government Markets

Executive Summary



City of Fort Lauderdale, Florida

P25 700/800 MHz Digital Simulcast Trunked Radio Network

December 18, 2025

MOTOROLA SOLUTIONS



Fort Lauderdale, the largest city in Broward County and a key regional center of South Florida, has seen considerable population growth in the last 10 years, bringing both opportunities and challenges. The City's leadership is strongly committed to modernizing infrastructure to serve residents and visitors effectively. Recognizing the critical role of public safety communications, Fort Lauderdale seeks to implement a new P25 700/800 MHz Digital Simulcast Trunked network. This vital project involves moving from a hosted primary core to a City dedicated core, expanding the system from three to four sites, and increasing the number of consoles and subscribers. This significant investment in Fort Lauderdale's future will enhance system capacity and improve local system management.

Motorola Solutions is prepared to help Fort Lauderdale meet its goals for the new system. The key elements of our proposal include:

- A City-owned ASTRO 25 Zone Core
- A City-owned ASTRO 25 Backup Zone Core, otherwise described by Motorola Solutions as a Dynamic System Resilience (DSR) Core
- A pair of geographically-redundant Prime Sites to serve the 10-channel simulcast cell
- Four (4) RF Sub-sites, equipped with ten (10) radio channels each
- Two (2) Dispatch Sites, equipped with eight (8) and six (6) operator positions respectively
- A backup control station for each dispatch console (14 in total)
- Critical Connect for interoperability with other partner agencies and broadband gateway functionality
- Traditional ISSI capability
- WAVE PTT broadband device integration
- ASTRO Connectivity Services for cloud-delivered functionality
- Motorola Solutions' Video Site Security
- Logging Recorder - Eventide
- Ring configuration and hot standby protected microwave with MPLS - Nokia
- 20 Year Maintenance and Upgrade Plan
- A dedicated Project Manager and Post Sale Engineer
- Five Motorola Digital Vehicular Repeater Systems (DVRS)
- Optional Cybersecurity (ActiveEye – Managed Detection and Response)
- Optional Subscriber Fleet Upgrade

The Motorola Solutions difference: our commitment to Fort Lauderdale

Motorola Solutions is dedicated to being a long-term partner for Fort Lauderdale, offering unparalleled experience, cutting-edge technology, and a commitment to seamless integration and ongoing support.

Understanding your vision

We understand Fort Lauderdale's key objectives: increased capacity, enhanced coverage, and greater control through a City-hosted core. We are the ideal partner to help you meet these objectives, offering a deep understanding of your existing system and a streamlined cutover plan to minimize end user disruption. Our solution includes an expedited 18-month deployment schedule demonstrating our commitment to achieving your goals swiftly.

Experience you can trust

As a global leader in Land Mobile Radio (LMR) for over 95 years, Motorola Solutions brings unmatched expertise and relevant experience, particularly within Fort Lauderdale and Broward County. We have a strong track record of successful P25 projects of similar scope across Florida and have been an longtime LMR partner to Fort Lauderdale. The City can be assured of a deeply experienced team that will deliver on project goals and provide long-term support. You can expect reliable, mission-critical solutions with minimal disruptions, delivered by experienced local resources familiar with Fort Lauderdale's system and processes.

Technological excellence & flexibility

Building on our knowledge of mission-critical communications and our enduring partnership with Fort Lauderdale, our proposed solution offers industry-leading quality and durability. Our products are rigorously tested to perform in the most demanding operational environments, and they are designed to ensure long-term system performance and seamless integration of emerging technologies. Our technology roadmap allows Fort Lauderdale to choose the upgrade path that best suits the City, as we partner with you to ensure a solution that continues to meet your needs into the future.

Unmatched hardening and redundancy

Motorola Solutions' proposed system prioritizes reliability through the elimination of single points of failure, which we achieve with redundant cores, Virtual Prime Sites, and ring-protected hot standby Microwave and Multiprotocol Label Switching (MPLS) designs. Our design experience and our robust cybersecurity measures, including Managed Detection and Response (MDR) and Endpoint Detection and Response (EDR), will provide Fort Lauderdale with enhanced reliability, availability, and continuity of service. Downtime and service interruptions are significantly reduced, and users benefit from seamless transitions during failovers.

Superior radio coverage and interoperability

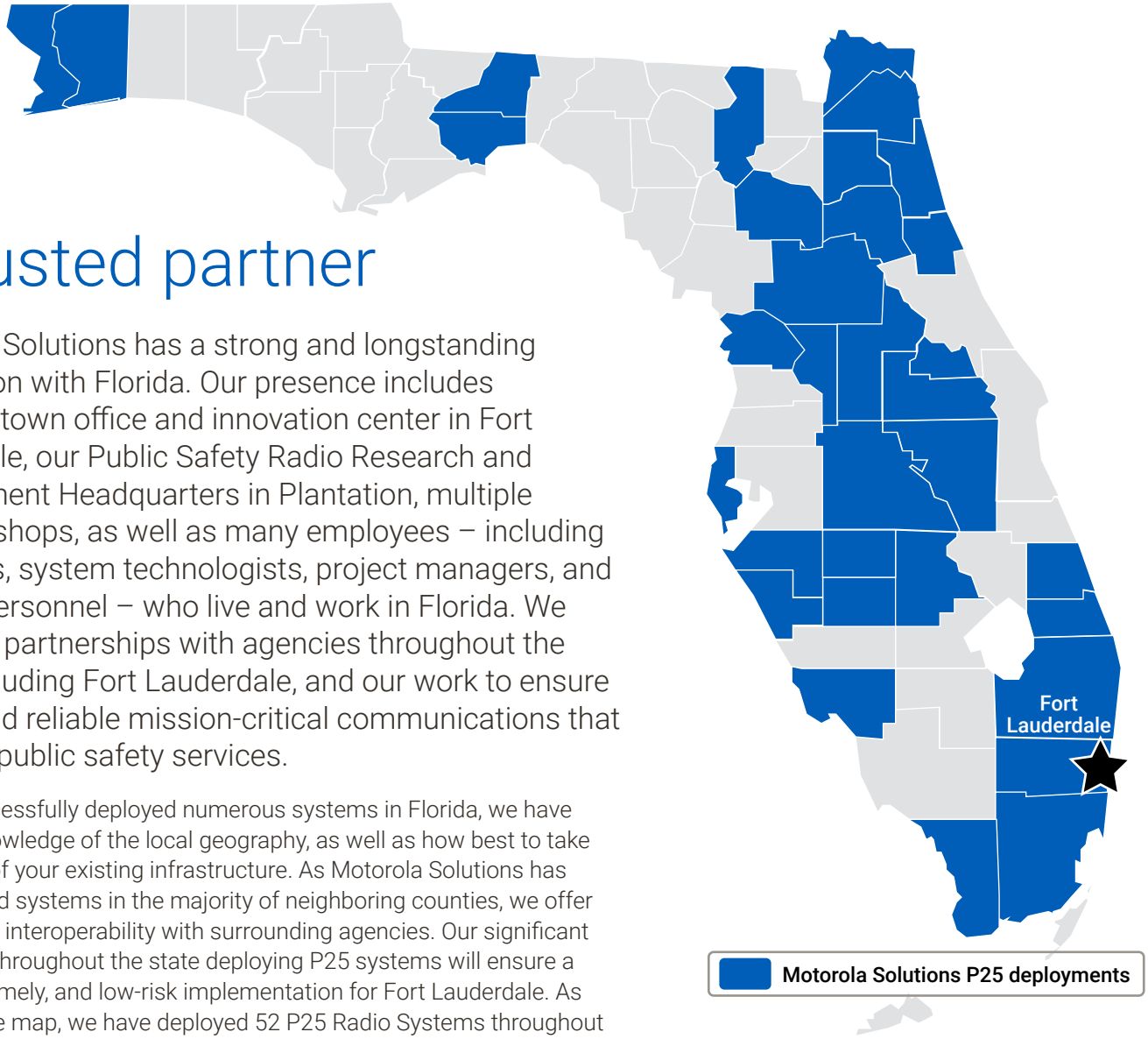
With our system design, Fort Lauderdale's first responders will benefit from enhanced coverage that surpasses RFP requirements. The solution includes ISSI connections to Broward County, SLERS, and the Motorola Solutions Hosted Master Core, as well as Critical Connect, which provides cloud-based interoperability across networks, agencies, and applications. The City can also leverage existing investments in Motorola Solutions Radios and SmartConnect to continue seamlessly integrating LMR/LTE connections.



A trusted partner

Motorola Solutions has a strong and longstanding connection with Florida. Our presence includes our downtown office and innovation center in Fort Lauderdale, our Public Safety Radio Research and Development Headquarters in Plantation, multiple services shops, as well as many employees – including engineers, system technologists, project managers, and service personnel – who live and work in Florida. We value our partnerships with agencies throughout the state, including Fort Lauderdale, and our work to ensure robust and reliable mission-critical communications that enhance public safety services.

Having successfully deployed numerous systems in Florida, we have intimate knowledge of the local geography, as well as how best to take advantage of your existing infrastructure. As Motorola Solutions has implemented systems in the majority of neighboring counties, we offer unparalleled interoperability with surrounding agencies. Our significant experience throughout the state deploying P25 systems will ensure a seamless, timely, and low-risk implementation for Fort Lauderdale. As shown in the map, we have deployed 52 P25 Radio Systems throughout the State of Florida.



The City of Fort Lauderdale has made key investments in Motorola Public Safety Communications technology, including all of the subscribers currently deployed on the system. Our familiarity with your network and our capacity to leverage existing technology in both the City and the region will provide substantial advantages to Fort Lauderdale, including:

- An easy cutover to the new system, minimizing disruptions to operations.
- A local support team familiar with the system and a reliable support plan.
- Ability to do a phased migration approach reusing existing site equipment if needed.
- Seamless interoperability with surrounding Motorola systems.
- Capacity to leverage existing investments in Motorola radios.
- Fort Lauderdale will receive a Dedicated Project Manager and Post Sale Engineer.
- An integrated CAD client that gives frontline responders a clear, consolidated view of assignments, unit status updates, with map views and multimedia – right on their Motorola radio.

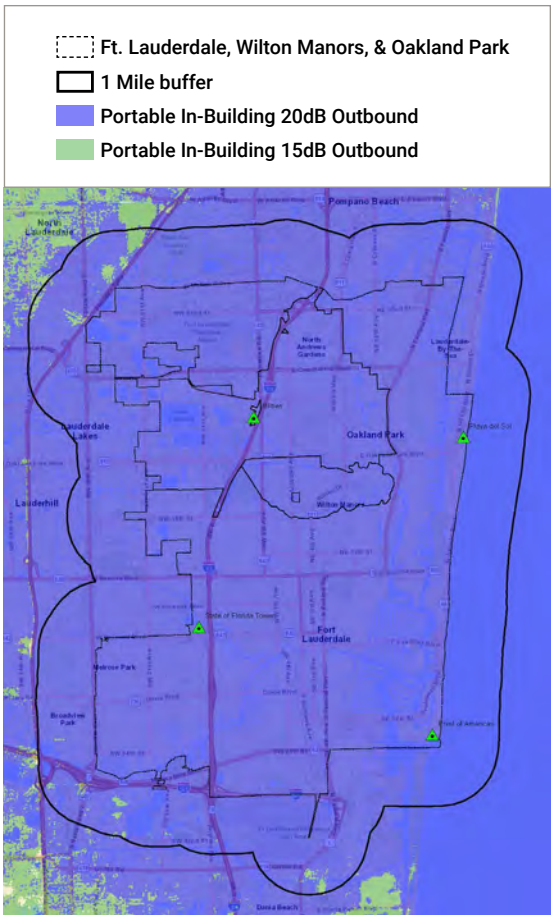
Enhanced radio coverage throughout the City

System coverage

Motorola Solutions guarantees that this solution will meet and exceed your stated coverage needs. Using our state-of-the-art coverage prediction tool, Hydra, we model and predict system coverage based on data from thousands of previous system designs and implementations.

Cirrus Central Management

CirrusCentral Management is a modern, cloud-based system management suite built for Motorola Solutions P25 radio systems. It can give you insights into your system's performance with detailed statistics and trends to help identify potential issues before they become a problem. The easy-to-use, intuitive interface helps streamline remediation of alarms and events. And you can access your radio system securely from any device, anywhere, over LTE, when it is difficult to access the network operations center.



ASTRO next generation D-series

The Motorola Solutions DBR Series Base Station ("D-Series") is one of our newest offerings for mission-critical public safety communications, designed to provide high reliability, extended coverage, and advanced digital capabilities. Benefits of the D-Series include:

Reduced downtime and outages

The D-Series Multicarrier Radio Site has a fault-tolerant design with extensive redundancy to improve resilience and reduce downtime. The combination of redundant hardware and software, resource pools, and dynamic resource allocation can minimize or eliminate the impact due to equipment failure.

Smaller footprint and lower site-related costs

The high channel capacity of the Multicarrier Site can reduce the space required in your facilities, saving site development costs. Each chassis can support up to 12 carriers of mixed 700/800 MHz frequency bands. This can reduce the footprint needed for site equipment as well as reduce the requirements for other site systems such as power, cooling, and more.

Simplified deployment and operation

If your site is in a frequency-congested area, the Multicarrier Site gives you access to almost 3 times the frequency choices due to its tighter spacing capabilities, compared to traditional site equipment. With whole-site software updates, the Multicarrier Site can make it easier to keep your equipment updated and secure.

Next generation AXS dispatch console

The AXS dispatch console offers a next generation dispatch experience, enabling integration across mission-critical technologies so emergency teams can seamlessly communicate and stay connected. A direct network connection to your Motorola Solutions ASTRO network makes the AXS dispatch console more reliable and provides for multiple forms of redundancy. It also enables critical capabilities that help dispatch personnel work effectively in moments when every second counts, including:

Priority - Dispatchers can have elevated priority on the radio system. This means the capacity to deliver critical messages in emergency situations without having to wait.

Capacity - Multi-channel patches only consume 1 channel, which protects your critical capacity and prevents busy signals so users can communicate.

Emergency Alerts - Dispatchers are guaranteed to receive emergency alarms, making sure that if a user triggers an emergency you will never miss it.

Fallback capabilities - If necessary to evacuate your dispatch center, dispatchers can relocate and continue your dispatching operations like you never left.

Aliases - First responder names appear on the console so dispatchers know immediately which first responder is calling for help or hitting their emergency button.

The AXS Dispatch console features:

- Customizable user interface
- Area-based dynamic talkgroups
- Stream simultaneous audio sessions
- Affiliation monitoring
- Remote talkgroup select



CAM #26-0710
Exhibit 4A
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Enhanced interoperability

Motorola Solutions' design ensures maximum interoperability with neighboring agencies. Our Critical Connect solution eliminates barriers and unifies communications through cloud-based interoperability. This real-time exchange of voice, video, messaging, and location data leads to more detailed intelligence and more informed mutual aid response regardless of device or network. Connections can grow in terms of capacity, unique connections, features, and future services, allowing the solution to evolve over time. Critical Connect and our ISSI connectivity will allow connections with Broward County, SLERS, Motorola Solutions Hosted Master Core, and additional connections as needed to achieve the interoperability Fort Lauderdale first responders need on a day-to-day basis.

Motorola Solutions' revolutionary network connectivity enhancement allows users to seamlessly roam from LMR coverage to broadband LTE. SmartConnect offers connectivity to a user's home LMR system from anywhere there is LTE Broadband or WiFi connectivity. We have included SmartConnect activation at our cores allowing the 700+ subscribers that have SmartConnect subscriptions to continue using this feature.



Project Management, Implementation, and On-going Support

Recognizing the critical nature of the Fort Lauderdale System Upgrade, Motorola Solutions is committed to providing unparalleled support. For the entire 18-month implementation period, as outlined in the preliminary schedule, the City of Fort Lauderdale project will benefit from a dedicated, full-time Project Manager and engineer. These exclusive resources are allocated to ensure you receive the necessary service and support throughout this vital implementation phase.

Our approach to deliver on an on-time, on-budget, successful deployment includes:

Expert Project Management

Motorola Solutions has decades of experience deploying systems similar to the one designed for Fort Lauderdale. We understand the planning and the strategic steps necessary to ensure a smooth deployment, and our dedicated PM and engineer will work with your team to ensure that the cutover to the new system is carried out with minimal disruption to the City's day-to-day operations.

Smooth Implementation: On-schedule, Minimal Disruption, No Surprises

Motorola Solutions' local team of project implementation experts will ensure a timely and efficient deployment, allowing for a rapid transition to the new system. Our experience deploying and servicing the current Fort Lauderdale system will ensure that users have access to all system deliverables as quickly as possible.

Installation Planning

Motorola Solutions has a dedicated, 40,000 square foot staging center for all large-scale systems. Integrating the system components and performing functional testing prior to shipment from CCSi reduces cycle time from the Detailed Design Review to system operation. Once the system has been assembled, optimized, and integrated, it will be tested according to agreed Factory Acceptance Test procedures.



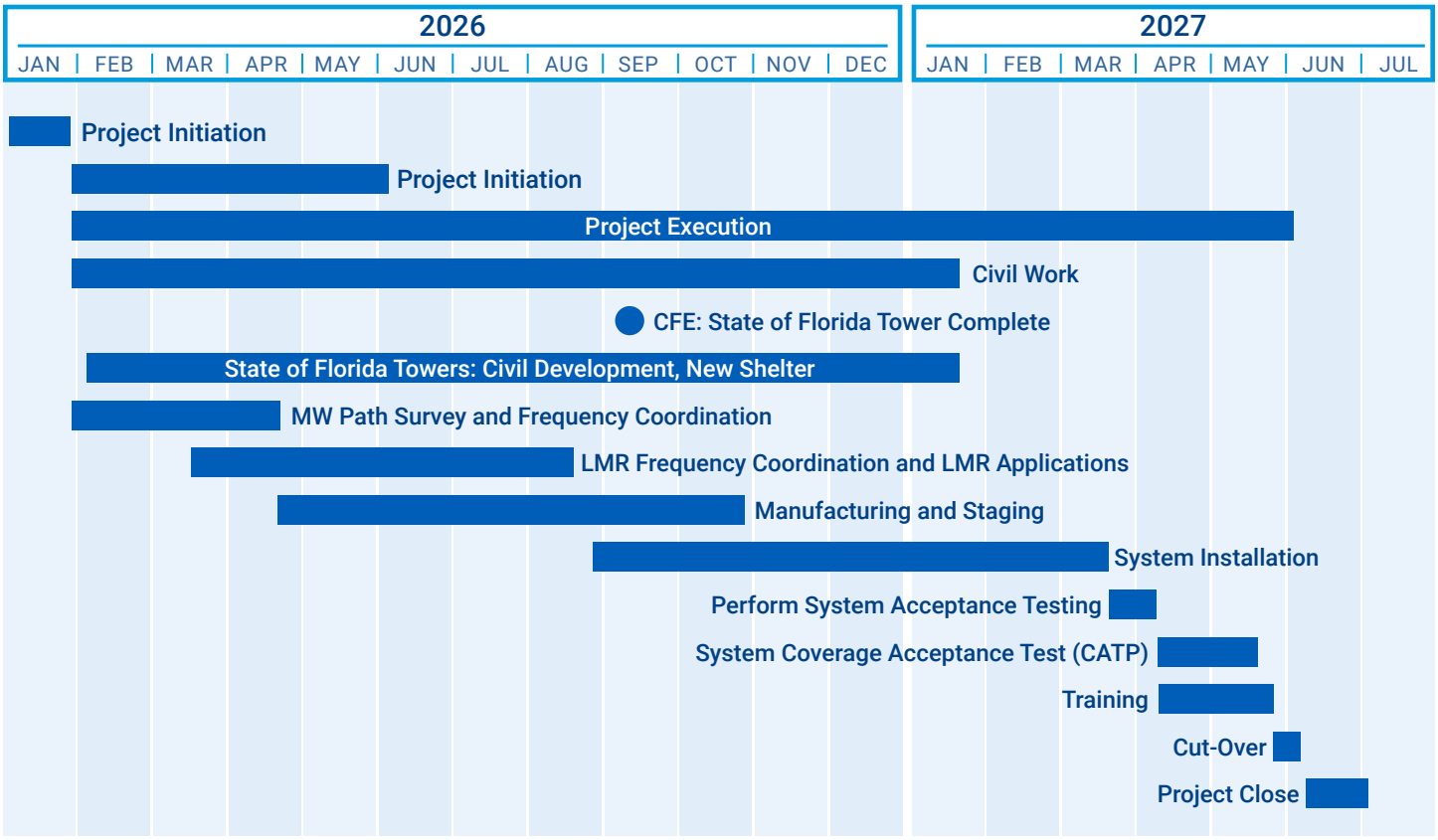
Phased Transition: Final Testing, Cutover, and Transition

Motorola Solutions proposes a comprehensive three-phased implementation plan for the City of Fort Lauderdale's transition from their existing hosted radio system to a new ASTRO 25 digital system, leveraging extensive experience in similar migrations. We will exceed the RFP deployment timeline with an 18-month schedule.

This plan prioritizes a smooth, uninterrupted transition with minimal user impact, beginning with an extensive **Pre-Cutover Preparation** phase that includes parallel infrastructure installation, system configuration (licensing, dispatch consoles, interoperability), and thorough optimization and testing to ensure the new system is fully functional.

The **Cutover Execution** phase will involve a carefully sequenced migration of channels and user talkgroups, enabling agencies to operate effectively on either system during the transition, with new dispatch consoles operating in parallel before the legacy system is decommissioned.

Finally, the **Post-Cutover** phase focuses on removing legacy components with no disruption to the new system, followed by a 30-day burn-in period to validate system performance under maximum load conditions, with clearly defined critical and minor failure parameters and a structured re-start procedure for critical failures, ensuring the City's complete satisfaction before final system acceptance.



Local support from radio experts who know your system

Fort Lauderdale's system success is of paramount importance to Motorola Solutions. We will apply our experience from partnering with Fort Lauderdale as your current radio provider and draw from a full team of Florida-based engineers, field service technicians, system technologists, subject matter experts, and qualified subcontractor personnel. Their expertise will ensure both smooth installation and ongoing operational support, and their proximity to Fort Lauderdale enables us to be on site quickly in event an incident occurs. We deeply value our collaboration with Fort Lauderdale, and look forward to continuing this strong partnership.

Maintenance and Support

Our Service agreements support the long term reliability, performance, and interoperability of Fort Lauderdale's System. On-going maintenance and support will commence upon expiration of the initial five-year comprehensive warranty period and will continue in conjunction with the remainder of the first five-year term renewable with the remaining three five-year terms. This proposal includes 20 years of System Upgrade Agreement (SUA) and maintenance support.

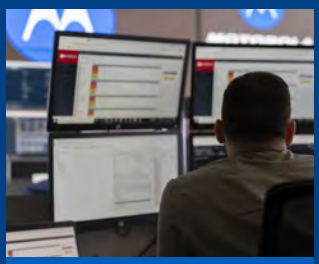
The Motorola Emergency Response Team (MERT)

MERT is a specialized unit within Motorola Solutions that delivers vital communication support to first responders and public safety agencies during emergencies and disasters. MERT's core mission is to guarantee uninterrupted communication for these agencies, enabling them to remain connected and respond effectively during critical situations.

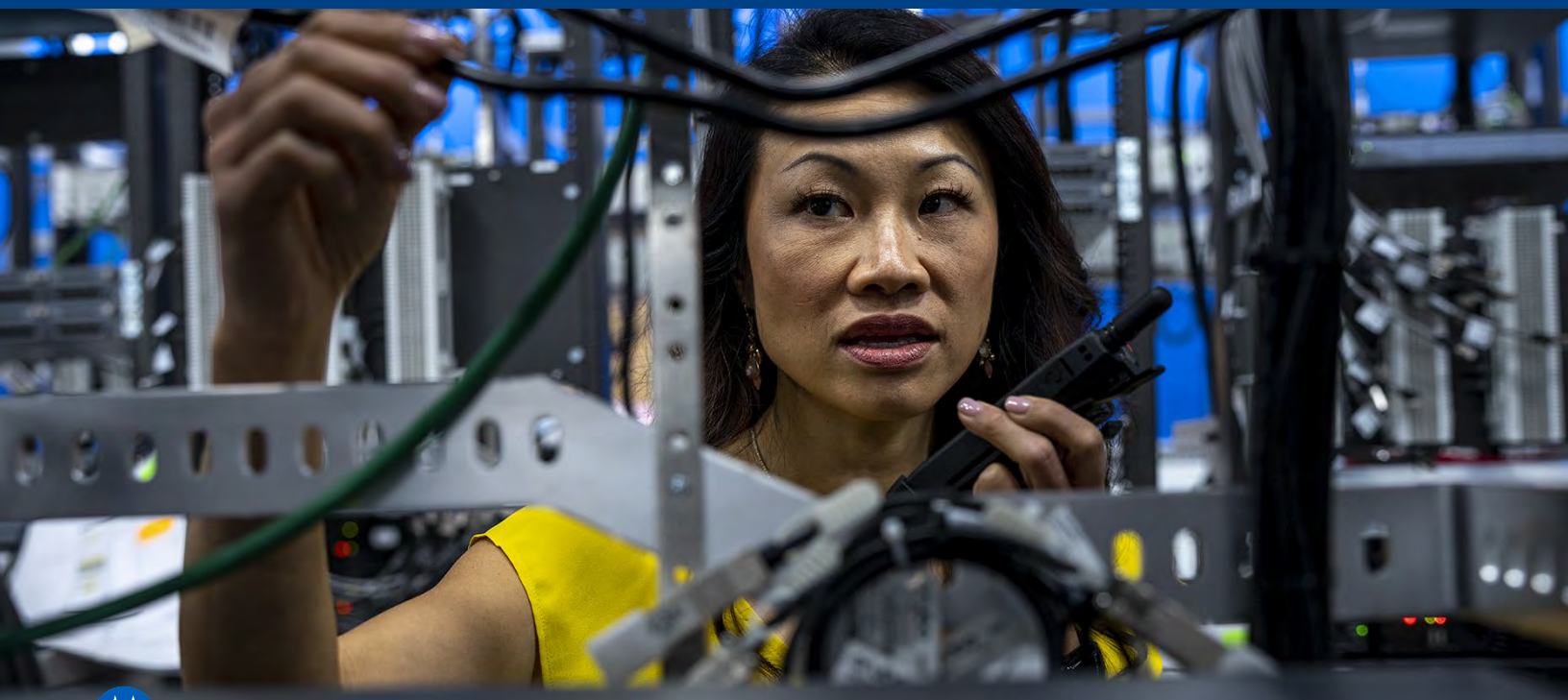
As a Motorola Solutions customer, you benefit from these nationwide resources in the event of a major emergency or natural disaster. The MERT team proactively and reactively monitors global news for potential disasters, ready to establish a temporary operational site within days. Upon declaration of an event, the MERT team will set up a dedicated 24/7 private phone line to provide support during those critical moments.

Additional services offered by Motorola Solutions during unforeseen emergencies include:

- Mission-critical devices and accessories (ordered under public safety emergency responses)
- Secure deployable radio sites
- Device rental program
- Rapidly restoring communication between a community and its first responders



Motorola Solutions' support and resources are available to ensure Fort Lauderdale is able to efficiently prepare for and quickly recover from a disaster



Reliability, Redundancy & Warranty

Motorola Solutions provides continual upgrades, redundancy in all aspects of our design, and long-term support options for Fort Lauderdale's consideration.

Reliability

Close to zero percent grade of service exceeding the RFP requirements ensures that mission-critical transmissions will not be dropped or delayed. Industry's most hardened infrastructure and radio equipment ensures it operates whenever you need it.

Redundancy

Redundancy is incorporated into our Fort Lauderdale design with multiple components and reduction of fail over points. Our redundant virtual prime sites and redundant cores enhance failure scenario methodology.

Warranty

Motorola Solutions' excellent warranty services provide five years of FNE and five years of subscriber support. In addition, we continue to provide our services into post-warranty for a total of 20 years of support.

Motorola Solutions thanks Fort Lauderdale for this opportunity

Motorola Solutions is excited about this P25 ASTRO system opportunity, and we would be honored to continue our partnership with Fort Lauderdale. With 95+ years of experience providing mission-critical radio solutions and applications worldwide, Motorola Solutions is committed to meeting and surpassing all of the requirements laid out in this RFP and we think you will find our response is predicated on making that happen... **on time – exceeding your expectations.**



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To learn more, visit: www.motorolasolutions.com

MOTOROLA SOLUTIONS

Motorola Solutions, Inc. 500 West Monroe Street, Chicago, IL 60661 U.S.A. motorolasolutions.com

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Section 1. SECTION I – INTRODUCTION AND INFORMATION

1.1 Purpose

The City of Fort Lauderdale, Florida (City) is seeking qualified, experienced and licensed firm(s), hereinafter referred to as Contractor, Proposer, Vendor, to provide the City with a new P25 700/800 MHz Digital Simulcast Trunked radio network capable of meeting current and future communication needs, reliably and functionally for the City, in accordance with the terms, conditions, and specifications contained in this Request for Proposals (RFP).

Comply

This proposal has been prepared in accordance with our understanding of your requirements, and based on the information provided and good systems design techniques. However, the actual results in your particular operations (including, among other aspects, coverage, personnel requirements, and costs) may vary from those indicated in the proposal due to factors outside the scope of this proposal. This can include, but is not limited to, variations in sites, equipment, volume, environment, personnel and other factors outside of Motorola Solutions' control. Any and all references to the term 'turnkey' shall mean the project contemplated herein will materially conform to the specifications more fully described in Motorola Solutions' response to this RFP.

1.2 Point of Contact

For information concerning procedures for responding to this solicitation, contact Procurement Specialist Laurie Platkin at (954) 828-538 or email at lplatkin@fortlauderdale.gov. Such contact shall be for clarification purposes only.

Understood

For information concerning technical specifications, please utilize the question / answer feature provided by the City's on-line strategic sourcing platform. Questions of a material nature must be received prior to the cut-off date specified in the RFP Schedule. Material changes, if any, to the scope of services or bidding procedures will only be transmitted by written addendum. Contractors please note: Proposals shall be submitted as stated in PART IV – Submittal Requirements. No part of your proposal can be submitted via FAX. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a proposal will be considered evidence that the Contractor has familiarized themselves with the nature and extent of the work, and the equipment, materials, and labor required. The entire proposal must be submitted in accordance with all specifications contained in this solicitation. The questions and answers submitted in the shall become part of any contract that is created from this RFP.

Comply

1.3 Pre-proposal Conference and Site Visit

There will be a pre-proposal conference and/or site visit scheduled for this Request for Proposal. It is strongly suggested that all Contractors attend the pre-proposal conference and/or site visit.

Understood.



While attendance is not mandatory, tours at other times might not be available. It is the sole responsibility of the Contractor to become familiar with the scope of the City's requirements and systems prior to submitting a proposal. No variation in price or conditions shall be permitted based upon a claim of ignorance. It is strongly suggested that all Contractors attend the pre-proposal meeting and/or site visit.

Understood.

It will be the sole responsibility of the Contractor to attend the pre-proposal/site visit to inspect the City's location(s) facilities systems prior to submitting a proposal. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a proposal will be considered evidence that the Proposer has familiarized themselves with the nature and extent of the work, equipment, materials, and labor required.

Understood.

If a person decides to appeal any decision made by the board, agency, or commission with respect to any matter considered at such meeting or hearing, he or she will need a record of the proceedings, and that, for such purpose, he or she may need to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which the appeal is to be based.

Understood.

1.4 **CITY'S** ON-LINE STRATEGIC SOURCING PLATFORM

The City of Fort Lauderdale uses the City's on-line strategic sourcing platform to administer the competitive solicitation process, including but not limited to soliciting proposals, issuing addenda, posting results and issuing notification of an intended decision. There is no charge to register and download the RFP from the City's on-line strategic sourcing platform. Proposers are strongly encouraged to read the supplier tutorials available in the City's on-line strategic sourcing platform well in advance of their intention of submitting a proposal to ensure familiarity with the use of the City's on-line strategic sourcing platform. The City shall not be responsible for a Proposers inability to submit a Proposal by the end date and time for any reason, including issues arising from the use of the City's on-line strategic sourcing platform.

Understood

It is the sole responsibility of the Proposer to ensure that their proposal is submitted electronically through the City's on-line strategic sourcing platform no later than the time and date specified in this solicitation.

Understood

PAPER PROPOSAL SUBMITTALS WILL NOT BE ACCEPTED. PROPOSALS MUST BE SUBMITTED ELECTRONICALLY VIA the City's on-line strategic sourcing platform.

Comply

1.5 Electronic Bid Openings/Proposal Closings

Please be advised that effective immediately, and until further notice, all Invitation to Bids, Request for Proposals, Request for Qualifications, and other solicitations led by the City of Fort Lauderdale will be opened electronically via the City's on-line strategic sourcing platform at the date and time indicated on the solicitation. All openings will be held on the City's on-line strategic sourcing platform.

Understood

Anyone requesting assistance or having further inquiry in this matter must contact the Procurement Specialist indicated on the solicitation, via the Question-and-Answer forum on the City's on-line strategic sourcing platform before the Last Day for Questions indicated in the Solicitation.

Comply



Section 2. SECTION II - SPECIAL TERMS AND CONDITIONS

2.1 General Conditions

RFP General Conditions (Form G-107, Rev. 02/22) are included and made a part of this RFP.

Understood

2.2 Addenda, Changes, and Interpretations

It is the sole responsibility of each firm to notify the Buyer utilizing the question / answer feature provided by the City's on-line strategic sourcing platform and request modification or clarification of any ambiguity, conflict, discrepancy, omission, or other error discovered in this competitive solicitation. Requests for clarification, modification, interpretation, or changes must be received prior to the Question and Answer (Q & A) Deadline. Requests received after this date may not be addressed. Questions and requests for information that would not materially affect the scope of services to be performed, or the solicitation process will be answered within the question / answer feature provided by the City's on-line strategic sourcing platform and shall be for clarification purposes only. Material changes, if any, to the scope of services or the solicitation process will only be transmitted by official written addendum issued by the City and uploaded to the City's on-line strategic sourcing platform as a separate addendum to the RFP. Under no circumstances shall an oral explanation given by any City official, officer, staff, or agent be binding upon the City and should be disregarded. All addenda are a part of the competitive solicitation documents, and each firm will be bound by such addenda. It is the responsibility of each to read and comprehend all addenda issued.

Comply

2.3 Changes and Alterations

Proposer may change or withdraw a Proposal at any time prior to Proposal submission deadline; however, no oral modifications will be allowed. Modifications shall not be allowed following the Proposal deadline.

Understood

2.4 Proposer's Costs

The City shall not be liable for any costs incurred by Proposers in responding to this RFP.

Understood

2.5 Pricing/Delivery

All pricing should be identified on the Cost Proposal page provided in this RFP. No additional costs may be accepted, other than the costs stated on the Cost Proposal page. Failure to use the City's Cost Proposal page and provide costs as requested in this RFP may deem your proposal non-responsive.

Understood

Contractor shall quote a firm, fixed price for all services stated in the RFP. All costs including travel shall be included in your proposal. The City shall not accept any additional costs including any travel associated with coming to the City of Fort Lauderdale.

Understood

All pricing must include delivery and installation and be quoted FOB: Destination.

Comply. See **Attachment 62 – 3.45.6.2 Per-Site Granular Detail.**

2.6 Price Validity

Prices provided in this Request for Proposals (RFP) shall be valid for at least One Hundred and Twenty (120) days from time of RFP opening unless otherwise extended and agreed upon by the City and Bidder/Proposer. The City shall award contract within this time period or shall request to the recommended awarded vendor an extension to hold pricing, until products/services have been awarded.

Comply

2.7 Invoices/Payment

The following payment schedule shall apply:

• 10% at Contract execution.

• 10% at delivery of inventory by the City or their designee of radio equipment and accessories to the City's designated location(s).

• 10% at successful completion of radio acceptance testing.

• 10% upon issuance of the portable radio equipment including completion of applicable training.

• 10% upon installation of the mobile radio and control station equipment including completion of applicable training.

• 45% upon Final Acceptance

• 5% upon receipt of Documentation.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Comply with Clarification

Motorola requests a modified payment schedule as stated below or a mutually negotiated version thereof. Additionally, we have provided an outline of the payment schedule for outyears of services in Attachment 62 – 3.45.6.2 Per-Site Granular Detail.

Except for a payment that is due on the Effective Date, Customer will make payments to Motorola within forty-five (45) days after the date of each invoice. Customer will make payments when due in the form of a check, cashier's check, or wire transfer drawn on a U.S. financial institution. If Customer has purchased additional Professional or Subscription services, payment will be in accordance with the applicable addenda. Payment for the System purchase will be in accordance with the following milestones.

System Purchase (excluding Subscribers & Accessories, if applicable)

1. 10% of the Contract Price due upon contract execution;

2. 10% of the Contract Price due upon Contract Design Review Completion and Acceptance;

3. 30% of the Contract Price due upon delivery of and inventory of equipment components to Ft. Lauderdale designated location(s). (Inventory to be completed in a reasonable timeframe)

4. 20% of the Contract Price due upon infrastructure installation completion;

5. 10% of the Contract Price due upon System Coverage Acceptance Test (CATP) completion;

6. 10% of the Contract Price due upon satisfactory completion of all training;

7. 10% of the Contract Price due upon Final Acceptance.

If Subscribers & Accessories are purchased, 100% of the Subscriber & Accessories Contract Price will be invoiced upon shipment (as shipped).

Motorola shall make partial shipments of equipment and will request payment upon shipment of such equipment. In addition, Motorola shall invoice for installations completed on a site-by-site basis or when professional services are completed, when applicable. The value of the equipment shipped/services performed will be determined by the value shipped/services performed as a percentage of the total milestone value. Unless otherwise specified, contract discounts are based upon all items proposed and overall system package. For invoicing purposes only, discounts will be applied proportionately to the FNE and Subscriber equipment values to total contract price. Overdue invoices will bear simple interest at the maximum allowable rate by state law.

For Lifecycle Support Plan and Subscription Based Services:

Motorola will invoice Customer annually in advance of each year of the plan.

Payment terms will be considered Net 45 days after the date of satisfactory delivery at the place of acceptance and receipt of correct invoice at the office specified, whichever occurs last, in accordance with the Florida Local Government Prompt Payment Act. Proposer may offer cash discounts for prompt payment, but they will not be considered in determination of award.

Comply

2.8 Related Expenses/Travel Expenses

All costs including travel are to be included in your bid. The City will not accept any additional costs.

Understood

2.9 Payment Method

Payment Method – N/A

Comply.

2.10 Mistakes

The proposer shall examine this RFP carefully. The submission of a Proposal shall be prima facie evidence that the consultant has full knowledge of the scope, nature, and quality of the work to be performed; the detailed requirements of the specifications; and the conditions under which the work is to be performed. Ignorance of the requirements will not relieve the consultant from liability and obligations under the Contract.

Understood

2.11 Acceptance of Proposals / Minor Irregularities

2.11.1 The City reserves the right to accept or reject any or all proposals, part of proposals, and to waive minor irregularities or variances to specifications contained in proposals which do not make the proposal conditional in nature and minor irregularities in the solicitation process. A minor irregularity shall be a variation from the solicitation that does not affect the price of the contract or does not give a respondent an advantage or benefit not enjoyed by other respondents, does not adversely impact the interests of other firms, or does not affect the fundamental fairness of the solicitation process. The City also reserves the right to reissue a Request for Proposal.

Comply

2.11.2 The City reserves the right to disqualify Proposer during any phase of the competitive solicitation process and terminate for cause any resulting contract upon evidence of collusion with intent to defraud or other illegal practices on the part of the Proposer.

Comply

2.12 Modification of Services

2.12.1 While this contract is for services provided to the department referenced in this RFP, the City may require similar work for other City departments. Successful Proposer agrees to take on such work unless such work would not be considered reasonable or become an undue burden to the Successful Proposer.

Understood

2.12.2 The City reserves the right to delete any portion of the work at any time without cause, and if such right is exercised by the City, the total fee shall be reduced in the same ratio as the estimated cost of the work deleted bears to the estimated cost of the work originally planned. If work has already been accomplished and approved by the City on any portion of a contract resulting from this RFP, the Successful Proposer shall be paid for the work completed on the basis of the estimated percentage of completion of such portion to the total project cost.

Comply

2.12.3 The City may require additional items or services of a similar nature, but not specifically listed in the contract. The Successful Proposer agrees to provide such items or services and shall provide the City prices on such additional items or services. If the price(s) offered are not acceptable to the City, and the situation cannot be resolved to the satisfaction of the City, the City reserves the right to procure those items or services from other vendors, or to cancel the contract upon giving the Successful Proposer thirty (30) days' written notice.

Understood

2.12.4 If the Successful Proposer and the City agree on modifications or revisions to the task elements, after the City has approved work to begin on a particular task or project, and a budget has been established for that task or project, the Successful Proposer will submit a revised budget to the City for approval prior to proceeding with the work.

Comply

2.13 Non-Exclusive Contract

Proposer agrees and understands that the contract shall not be construed as an exclusive arrangement and further agrees that the City may, at any time, secure similar or identical services from another vendor at the City's sole option.

Comply

2.14 Sample Contract Agreement

A sample of the formal agreement template, which may be required to be executed by the awarded vendor can be found at our website: https://www.fortlauderdale.gov/home/showdocument?id=1212

Understood. Motorola included additional, negotiable terms and conditions in Exhibit A – Sample Contract Agreement.

2.15 Responsiveness

In order to be considered responsive to the solicitation, the firm's proposal shall fully conform in all material respects to the solicitation and all its requirements, including all form and substance.

Understood

Motorola complies subject to the list of clarifications in its response and the Sample Contract included with its response.

2.16 Responsibility

In order to be considered as a responsible firm, firm shall be fully capable to meet all of the requirements of the solicitation and subsequent contract, must possess the full capability, including financial and technical, to perform as contractually required, and must be able to fully document the ability to provide good faith performance.

Comply

2.17 Minimum Qualifications

Proposers shall be in the business of Project 25 (P25) radio communications and telecommunications equipment and must possess sufficient financial support, equipment, and organization to ensure that it can satisfactorily perform the services if awarded a Contract. Proposers must demonstrate that they, or the key staff assigned to the project, have successfully provided services with similar magnitude to those specified in the scope of services to at least one entity similar in size and complexity to the City of Fort Lauderdale or can demonstrate they have the experience with large scale private sector clients and the managerial and financial ability to successfully perform the work.

Comply

Proposers shall satisfy each of the following requirements cited below. Failure to do so may result in the proposal being deemed non-responsive.

Comply

2.17.1 Proposer or principals shall have relevant experience in radio communications and telecommunications equipment. Project manager assigned to the work must have experience in successful implementation of a P25 700/800 MHz Digital Simulcast Trunked radio network and have served as project manager on similar projects.

Comply

2.17.2 Before awarding a contract, the City reserves the right to require that a Proposer submit such evidence of qualifications as the City may deem necessary. Further, the City may consider any evidence of the financial, technical, and other qualifications and abilities of a firm or principals, including previous experiences of same with the City and performance evaluation for services, in making the award in the best interest of the City.

Comply

2.17.3 Firm or principals shall have no record of judgments, pending lawsuits against the City or criminal activities involving moral turpitude and not have any conflicts of interest that have not been waived by the City Commission.

Comply

2.17.4 Neither firm nor any principal, officer, or stockholder shall be in arrears or in default of any debt or contract involving the City, (as a party to a contract, or otherwise); nor have failed to perform faithfully on any previous contract with the City.

Comply

2.18 Lobbying Activities

ALL CONTRACTORS PLEASE NOTE: Any contractor submitting a response to this solicitation must comply, if applicable, with City of Fort Lauderdale Ordinance No. C-11-42 & Resolution No. 07-101, Lobbying Activities. Copies of Ordinance No. C-11-42 and Resolution No. 07-101 may be obtained from the City Clerk’s Office on the 4th Floor of One East Broward Boulevard, Suite 444, Fort Lauderdale, Florida. The ordinance may also be viewed on the City's website at: http://www.fortlauderdale.gov/home/showdocument?id=6036.

Comply

2.19 Local Business Preference – N/A

2.20 Disadvantaged Business Enterprise Preference – N/A

2.21 Protest Procedure

2.21.1 Any Proposer who is not recommended for award of a contract and who alleges a failure by the city to follow the city's procurement ordinance or any applicable law, may follow the protest procedure as found in the city's procurement ordinance within five (5) days after a notice of intent to award is posted on the city's web site at the following link. https://www.fortlauderdale.gov/government/departments-a-h/finance/procurement-services/notices-of-intent-to-award

Understood

2.21.2 The complete protest ordinance may be found on the city's web site at the following link: https://library.municode.com/fl/fort_lauderdale/codes/code_of_ordinances?nodeId=COOR_CH2AD_ARTVFI_DIV2PR_S2-182DIREPRAWINAW

Understood

2.22 Public Entity Crimes

Contractor represents that the execution of this Agreement will not violate the Public Entity Crime Act, Section 287.133, Florida Statutes (2024), as may be amended or revised, which essentially provides that a person or affiliate who is a contractor, consultant, or other provider and who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to City, may not submit a bid on a contract with City for the construction or repair of a public building or public work, may not submit bids on leases of real property to City, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under an Agreement with City, and may not transact any business with City in excess of the threshold amount provided in Section 287.017, Florida Statutes (2024), as may be amended or revised, for category two purchases for a period of 36 months from the date of being placed on the convicted vendor list. Violation of this Section shall result in termination of this Agreement and recovery of all monies paid by City pursuant to this Agreement and may result in debarment from City's competitive procurement activities.

Comply

2.23 Subcontractors

2.23.1 If the Contractor proposes to use subcontractors in the course of providing these services to the City, this information shall be a part of the bid/proposal response. Such information shall be subject to review, acceptance, and approval of the City, prior to any contract award. The City reserves the right to approve or disapprove of any subcontractor candidate in its best interest and to require Contractor to replace subcontractor with one that meets City approval.

Understood

2.23.2 Contractor shall ensure that all of Contractor's subcontractors perform in accordance with the terms and conditions of this Contract. Contractor shall be fully responsible for all of Contractor's subcontractors' performance, and liable for any of Contractor's subcontractors' non-performance and all of Contractor's subcontractors' acts and omissions. Contractor shall defend, at Contractor's expense, counsel being subject to the City's approval or disapproval, and indemnify and hold harmless the City and the City's officers, employees, and agents from and against any claim, lawsuit, third-party action, or judgment, including any award of attorney fees and any award of costs, by or in favor of any Contractor's subcontractors for payment for work performed for the City.

Comply

2.23.3 Contractor shall require all its subcontractors to provide the required insurance coverage as well as any other coverage that the contractor may consider necessary, and any deficiency in the coverage or policy limits of said subcontractors will be the sole responsibility of the contractor.

Comply

2.24 Proposal Security

2.24.1 A proposal security payable to the City of Fort Lauderdale shall be submitted with the proposal response in the amount of five percent (5%) of the total proposed amount. A proposal security can be in the form of a bid/proposal bond or cashier's check. Proposal security will be returned to the unsuccessful contractor as soon as practicable after opening of proposals. Proposal security will be returned to the successful Proposer after acceptance of the Payment and Performance Bond, if required; acceptance of insurance coverage, if required; and full execution of contract documents, if required; or other conditions as stated in Special Conditions or elsewhere in the RFP.

Comply. See Exhibit D – Bid Bond.

2.24.2 The Proposer shall deliver the original, signed and sealed bid/proposal bond within five (5) business days from the solicitation end date, or it will be determined as non-responsive. A bid/proposal security in the form of a cashier's check must be an original document and must be submitted at time of the bid/proposal due date. If choosing the cashier's check method, plan in advance to send via United States Postal Service or air freight carrier to ensure cashier's check arrives on or before bid opening/proposal closing deadline.

Comply

A. Deliver via United States Postal Service or air freight carrier to City of Fort Lauderdale, Procurement Services Division, 101 NE 3rd Avenue, Suite 1650, Fort Lauderdale, FL 33301.

Understood

B. Include company name, solicitation number and title clearly indicated outside of the envelope.

Understood

2.24.3 Failure of the successful Proposer to execute a contract, provide a Performance Bond, and furnish evidence of appropriate insurance coverage, as provided herein, within thirty (30) days after written notice of award has been given, shall be just cause for the annulment of the award and the forfeiture of the proposal security to the City, which forfeiture shall be considered, not as a penalty, but as liquidation of damages sustained.

Understood

2.25 Payment and Performance Bond

2.25.1 The Proposer shall within fifteen (15) working days after notification of award, furnish to the City a Payment Bond in the amount of one hundred percent (100%) of the Contract price would likewise be required. The Payment Bond must be from a surety company authorized to do business in the State of Florida with a rating of A- or better in the most current edition of the A.M. Best Insurance Report. The cost of the Payment Bond shall be the responsibility of the Contractor.

Comply

2.25.2 A Performance Bond in the amount of one hundred percent (100%) of the Contract Price shall be provided by the Contractor in the event a contract is subsequently awarded through either a sole-source or competitive procurement process. The Performance Bond shall be exercised by the Customer for failure of the Contractor to perform according to the terms of the Contract, i.e., an uncured default condition that results in Contract Cancellation. The Performance Bond shall be in place prior to a notice to proceed. The cost of the Performance Bond shall be the responsibility of the Contractor. The Performance Bond must be executed by a surety company or recognized standing to do business in the State of Florida and having a resident agent.

Comply

2.25.3 The Proposer must have a Financial Size Categories (FSC) rating of no less than “A-” by the latest edition of Best’s Key Rating Guide, or acceptance of insurance company that holds a valid Florida Certificate of Authority issued by the State of Florida, Department of Insurance, and are members of the Florida Guarantee Fund. Acknowledgement and agreement is given by both parties that the amount herein set for the Payment and Performance Bond is not intended to be nor shall be deemed to be in the nature of liquidated damages nor is it intended to limit the liability of the Contractor to the City in the event of a material breach of this Agreement by the Contractor.

Comply

2.26 Insurance Requirements

2.26.1 As a condition precedent to the effectiveness of this Agreement, during the term of this Agreement and during any renewal or extension term of this Agreement, the Contractor, at its sole expense, shall provide insurance of such types and with such terms and limits as noted below. Providing proof of and maintaining adequate insurance coverage are material obligations of the Contractor. The Contractor shall provide the City a certificate of insurance evidencing such coverage. The Contractor’s insurance coverage shall be primary insurance for all applicable policies. The limits of coverage under each policy maintained by the Contractor shall not be interpreted as limiting the Contractor’s liability and obligations under this Agreement. All insurance policies shall be through insurers authorized or eligible to write policies in the State of Florida and possess an A.M. Best rating of A-, VII or better, subject to approval by the City’s Risk Manager.

Comply with Clarification

Contractor complies with the following change: The Contractor’s Commercial General Liability and Automobile Liability insurance coverage shall be primary insurance to the insurance carried by the City and its affiliates. Contractor requests that "for all applicable policies" be deleted.

2.26.2 The coverages, limits, and endorsements required herein protect the interests of the City, and these coverages, limits, and/or endorsements shall in no way be relied upon by the Contractor for assessing the extent or determining appropriate types and limits of coverage to protect the Contractor against any loss exposures, whether as a result of this Agreement or otherwise. The requirements contained herein, as well as the City's review or acknowledgement, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by the Contractor under this Agreement.

Comply

2.26.3 The following insurance policies and coverages are required:

Commercial General Liability

Comply

Coverage must be afforded under a Commercial General Liability policy with limits not less than:

Comply

• $1,000,000 each occurrence and $2,000,000 aggregate for Bodily Injury, Property Damage, and Personal and Advertising Injury

Comply

• $1,000,000 each occurrence and $2,000,000 aggregate for Products and Completed Operations

Comply

Policy must include coverage for contractual liability and independent contractors.

Comply

The City, a Florida municipality, its officials, employees, and volunteers are to be included as an additional insured with a CG 20 26 04 13 Additional Insured – Designated Person or Organization Endorsement or similar endorsement providing equal or broader Additional Insured Coverage with respect to liability arising out of activities performed by or on behalf of Contractor. The coverage shall contain no special limitation on the scope of protection afforded to the City, its officials, employees, and volunteers.

Comply

Professional Liability

Comply

Coverage must be afforded for Wrongful Acts in an amount not less than $1,000,000 each claim and $2,000,000 aggregate.

Comply

Contractor must keep the professional liability insurance in force until the third anniversary of expiration or early termination of this Agreement or the third anniversary of acceptance of work by the City, whichever is longer, which obligation shall survive expiration or early termination of this Agreement.



Comply

Crane and Rigging Liability

Comply

If contractor is going to be utilizing crane and rigging, coverage must be afforded for any crane operations under the Commercial General or Business Automobile Liability policy as necessary, in line with the limits of the associated policy.

Business Automobile Liability

Comply

Coverage must be afforded for all Owned, Hired, Scheduled, and Non-Owned vehicles for Bodily Injury and Property Damage in an amount not less than $1,000,000 combined single limit each accident.

Comply

If Contractor does not own vehicles, Contractor shall maintain coverage for Hired and Non-Owned Auto Liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Auto Liability policy.

Comply

Workers' Compensation and Employer's Liability

Comply with Clarifications listed under the items below:

Coverage must be afforded per Chapter 440, Florida Statutes. Any person or entity performing work for or on behalf of the City must provide Workers' Compensation insurance. Exceptions and exemptions will be allowed by the City's Risk Manager, if they are in accordance with Florida Statute.

Comply

Contractor waives, and Contractor shall ensure that Contractor's insurance carrier waives, all subrogation rights against the City, its officials, employees, and volunteers for all losses or damages. The City requires the policy to be endorsed with WC 00 03 13 Waiver of our Right to Recover from Others or equivalent.

Comply

Contractor must be in compliance with all applicable State and federal workers' compensation laws.

Comply

2.26.4 Insurance Certificate Requirements

Comply

a. The Contractor shall provide the City with valid Certificates of Insurance (binders are unacceptable) no later than ten (10) days prior to the start of work contemplated in this Agreement.

Comply

b. The Contractor shall provide to the City a Certificate of Insurance having a thirty (30) day notice of cancellation; ten (10) days' notice if cancellation is for nonpayment of premium.

Comply

c. In the event that the insurer is unable to accommodate the cancellation notice requirement, it shall be the responsibility of the Contractor to provide the proper notice. Such notification will be in writing by registered mail, return receipt requested, and addressed to the certificate holder.

Comply

d. In the event the Agreement term or any surviving obligation of the Contractor following expiration or early termination of the Agreement goes beyond the expiration date of the insurance policy, the Contractor shall provide the City with an updated Certificate of Insurance no later than ten (10) days prior to the expiration of the insurance currently in effect. The City reserves the right to suspend the Agreement until this requirement is met.

Comply e. The Certificate of Insurance shall indicate whether coverage is provided under a claims-made or occurrence form. If any coverage is provided on a claims-made form, the Certificate of Insurance must show a retroactive date, which shall be the effective date of the initial contract or prior.

Comply

The Certificate of Insurance shall indicate whether coverage is provided under a claims-made or occurrence form. If any coverage is provided on a claims-made form, the retroactive date shall be before the effective date of the initial contract or prior. The City shall be named as an Additional Insured on all liability policies, with the exception of Workers' Compensation.

Comply

The City shall be included as an Additional Insured on the Commercial General Liability and Automobile Liability policies. g. The City shall be granted a Waiver of Subrogation on the Contractor's Workers' Compensation insurance policy.

Comply

h. The title of the Agreement, Bid/Proposal/Contract number, event dates, or other identifying reference must be listed on the Certificate of Insurance.

Comply

The Certificate Holder should read as follows:

City of Fort Lauderdale

Attn.: Procurement Services Department

401 SE 21st Street

Fort Lauderdale, FL 33316

Comply

2.26.5 The Contractor has the sole responsibility for all insurance premiums and shall be fully and solely responsible for any costs or expenses as a result of a coverage deductible, co-insurance penalty, or self-insured retention; including any loss not covered because of the operation of such deductible, co-insurance penalty, self-insured retention, or coverage exclusion or limitation. Any costs for adding the City as an Additional Insured shall be at the Contractor's expense.

Comply

2.26.6 If the Contractor's primary insurance policy/policies do not meet the minimum requirements, as set forth in this Agreement, the Contractor may provide evidence of an Umbrella/Excess insurance policy to comply with this requirement.

Comply

2.26.7 The Contractor's insurance coverage shall be primary insurance as respects to the City, a Florida municipal corporation, its officials, employees, and volunteers. Any insurance or self-insurance maintained by the City, a Florida municipal corporation, its officials, employees, or volunteers shall be non-contributory.

Comply with Clarification

The Contractor's Commercial General Liability and Automobile Liability insurance coverage shall be primary insurance as respects to the City, a Florida municipal corporation, its officials, employees, and volunteers. Any insurance or self-insurance maintained by the City, a Florida municipal corporation, its officials, employees, or volunteers shall be non-contributory.

2.26.8 Any exclusion or provision in any insurance policy maintained by the Contractor that excludes coverage required in this Agreement shall be deemed unacceptable and shall be considered breach of contract.

Comply

2.26.9 All required insurance policies must be maintained until the contract work has been accepted by the City, or until this Agreement is terminated, whichever is later. Any lapse in coverage shall be considered breach of contract. In addition, Contractor must provide to the City confirmation of coverage renewal via an updated certificate should any policies expire prior to the expiration of this Agreement. The City reserves the right to review, at any time, coverage forms and limits of Contractor's insurance policies.

Comply

All required insurance policies must be maintained until the contract work has been accepted by the City, or until this Agreement is terminated, whichever is later. Any lapse in coverage shall be considered breach of contract. In addition, Contractor must provide to the City confirmation of coverage renewal via an updated certificate should any policies expire prior to the expiration of this Agreement. 2.26.10 The Contractor shall provide notice of any and all claims, accidents, and any other occurrences associated with this Agreement shall be provided to the Contractor's insurance company or companies and the City's Risk Management office as soon as practical.

Comply

2.26.11 It is the Contractor's responsibility to ensure that any and all of the Contractor's independent contractors and subcontractors comply with these insurance requirements. All coverages for independent contractors and subcontractors shall be subject to all of the applicable requirements stated herein. Any and all deficiencies are the responsibility of the Contractor.

Comply

2.27 Award of Contract

A Contract (the “Agreement”) may be awarded by the City Commission. The City reserves the right to execute or not execute, as applicable, a contract with the Proposer(s) that is determined to be in the City’s best interests. The City reserves the right to award a contract to more than one Proposer, at the sole and absolute discretion of the City.

Understood

Contractor has priced the Services, Software, and Equipment as an integrated System. A change in Software or Equipment quantities, or Services, may affect the overall Contract Price, including discounts if applicable.

2.28 Unauthorized Work

The Successful Proposer(s) shall not begin work until a Contract has been awarded by the City Commission and a notice to proceed has been issued. Proposer(s) agree and understand that the issuance of a Purchase Order and/or Task Order shall be issued and provided to the Successful Proposer(s) following Commission award; however, receipt of a purchase order and/or task order shall not prevent the Successful Proposer(s) from commencing the work once the City Commission has awarded the contract and notice to proceed is issued.

Comply

2.29 Damage to Public or Private Property

Extreme care shall be taken to safeguard all existing facilities, site amenities, irrigation systems, vehicles, etc. on or around the job site. Damage to public and/or private property shall be the responsibility of the Contractor and shall be repaired and/or replaced at no additional cost to the City.

Comply

2.30 Safety

The Contractor(s) shall adhere to the Florida Department of Transportation’s Uniform manual on Traffic Control for construction and maintenance work zones when working on or near a roadway. It will be the sole responsibility of the Contractor to make themselves and their employees fully aware of these provisions, especially those applicable to safety.

Comply

2.31 Uncontrollable Circumstances ("Force Majeure")

The City and Contractor will be excused from the performance of their respective obligations under this agreement when and to the extent that their performance is delayed or prevented by any circumstances beyond their control including, fire, flood, explosion, strikes or other labor disputes, act of God or public emergency, war, riot, civil commotion, malicious damage, act or omission of any governmental authority, delay or failure or shortage of any type of transportation, equipment, or service from a public utility needed for their performance, provided that:

Comply

2.31.1 The non-performing party gives the other party prompt written notice describing the particulars of the Force Majeure including, but not limited to, the nature of the occurrence and its expected duration, and continues to furnish timely reports with respect thereto during the period of the Force Majeure;

Comply

2.31.2 The excuse of performance is of no greater scope and of no longer duration than is required by the Force Majeure;

Comply

2.31.3 No obligations of either party that arose before the Force Majeure causing the excuse of performance are excused as a result of the Force Majeure; and

Comply

2.31.4 The non-performing party uses its best efforts to remedy its inability to perform. Notwithstanding the above, performance shall not be excused under this Section for a period in excess of two (2) months, provided that in extenuating circumstances, the City may excuse performance for a longer term. Economic hardship of the Contractor will not constitute Force Majeure. The term of the agreement shall be extended by a period equal to that during which either party's performance is suspended under this Section. Notwithstanding anything to the contrary, a Force Majeure event shall not include any of the following: (a) changes in economic or market conditions, (b) fluctuations in costs or prices, or (c) the imposition, change, or repeal of any taxes, duties, tariffs, or trade restrictions by a governmental authority.

Comply

2.32 Canadian Companies

In the event Contractor is a corporation organized under the laws of any province of Canada or is a Canadian federal corporation, the City may enforce in the United States of America or in Canada or in both countries a judgment entered against the Contractor. The Contractor waives any and all defenses to the City’s enforcement in Canada, of a judgment entered by a court in the United States of America. All monetary amounts set forth in this Contract are in United States dollars.

Comply

2.33 News Releases/Publicity

News releases, publicity releases, or advertisements relating to this contract, or the tasks or projects associated with the project shall not be made without prior City approval.

Understood

2.34 Manufacturer/Brand/Model Specific Request

This is a manufacturer/brand/model specification. No substitutions will be allowed.

Comply

2.35 Contract Period

The initial contract term shall commence upon date of award by the City and shall expire five (5) years from that date. The City reserves the right to extend the contract for three (3), additional five (5) year terms, providing all terms conditions and specifications remain the same, both parties agree to the extension, and such extension is approved by the City.

Comply

In the event services are scheduled to end because of the expiration of this contract, the Contractor shall continue the service upon the request of the City as authorized by the awarding authority. The extension period shall not extend for more than 270 days beyond the expiration date of the existing contract. The Contractor shall be compensated for the service at the rate in effect when this extension clause is invoked by the City.

Comply

2.36 Cost Adjustments

Prices quoted shall be firm for the term of the contract.

Comply

2.37 Service Test Period – N/A

2.38 Contract Coordinator

The City may designate a Contract Coordinator whose principal duties shall be:

• Liaison with Contractor.

Comply

• Coordinate and approve all work under the contract.

Comply

• Resolve any disputes.

Comply

• Assure consistency and quality of Contractor's performance.

Comply

• Schedule and conduct Contractor performance evaluations and document findings.

Comply

• Review and approve for payment all invoices for work performed or items delivered.

Comply

2.39 Contractor Performance Reviews and Ratings

The City Contract Coordinator may develop a Contractor performance evaluation report. This report shall be used to periodically review and rate the Contractor's performance under the contract with performance rating as follows:

Excellent: Far exceeds requirements.

Good: Exceeds requirements

Fair: Just meets requirements.

Poor: Does not meet all requirements, and contractor is subject to penalty provisions under the contact.

Non-compliance Either continued poor performance after notice or a performance level that does not meet a significant portion of the requirements.

Understood

This rating makes the Contractor subject to the default or cancellation for cause provisions of the contract.

Understood

The report shall also list all discrepancies found during the review period. The Contractor shall be provided with a copy of the report and may respond in writing if he takes exception to the report or wishes to comment on the report. Contractor performance reviews and subsequent reports will be used in determining the suitability of contract extension.

Understood

2.40 Substitution of Personnel

It is the intention of the City that the Contractor's personnel proposed for the contract will be available for the contract term. In the event the Contractor wishes to substitute personnel, he shall propose personnel of equal or higher qualifications and all replacement personnel are subject to City approval. In the event substitute personnel are not satisfactory to the City and the matter cannot be resolved to the satisfaction of the City, the City reserves the right to cancel the Contract for cause. See Section 5.09 General Conditions.

Comply

2.41 Ownership of Work

The City shall have full ownership and the right to copyright, otherwise limit, reproduce, modify, sell, or use all the work or product produced under this contract without payment of any royalties or fees to the Contractor above the agreed hourly rates and related costs.

Comply with Clarification

Although the City will not be charged for ownership rights, however, such ownership rights will not include software and the City's ability to copyright it, otherwise limit, reproduce, modify, sell, or use all the services associated with software or product that is not hardware.

2.42 Condition of Trade-In Equipment

It shall be the sole responsibility of the Contractor to inspect the trade in equipment or to assure himself of their condition. No variation in trade in credit shall be permitted based upon a claim of ignorance. Submission of a bid/proposal will be considered evidence, by the City, that the Contractor has familiarized himself with the condition of the trade in equipment.

Comply. See Pricing in Attachment 62 – 3.45.6.2 Per-Site Granular Detail.

The City understands that the condition of the equipment may change prior to shipment or pick up of the equipment by Contractor. No warranty or guarantee of the condition of the equipment is offered or implied. The Contractor agrees to take the equipment, at the trade in credit price bid/proposal, in the condition the equipment is at the time it leaves the City. The only commitment the City makes is to continue the same (whichever is applicable) maintenance service, operational standards, or storage conditions from the time the solicitation is issued until trade in equipment shipment or pick up by Contractor.

Comply

2.43 Conditions of Trade-In Shipment and Purchase Payment

All Prices of purchase items are to be Free on Board (FOB) Destination delivered to the specified City Agency. All Trade-in equipment prices are to be FOB City Agency. City will ship trade-in equipment FOB City Agency freight, collect to the address specified by the Contractor, or Contractor can arrange to pick up.

Comply

No City release of trade in equipment will be allowed prior to receipt and acceptance of purchased equipment will be allowed unless prior arrangements have been made with the City Agency and approved by the Procurement Services Department.

Comply

Payment for the net cost to the City (purchase price less trade-in credit) will be made within 45 days from acceptance of the purchase equipment or receipt of a correct invoice, whichever occurs last.

Comply

2.44 Verification of Employment Status

Any Contractor/Consultant assigned to perform responsibilities under its contract with a State agency is required to utilize the US Department of Homeland Security's E-Verify system (per Executive Order Number 11-02) to verify the employment eligibility of: (a) all persons employed during the contract term by the Contractor to perform employment duties within Florida; and (b) all persons (including subcontractors) assigned by the Contractor to perform work pursuant to the contract with the State agency.

Comply

E-VERIFY Affirmation Statement must be completed and submitted with Proposer's response to this RFP.

Comply

2.45 Service Organization Controls

The Contractor must provide a current SSAE 18, SOC 2, Type I report with their proposal. A proposer shall be deemed non-responsive for failure to submit its SSAE 18, SOC 2, Type 1 report with its proposal at time of deadline. Successful Proposer will be required to provide an SSAE 18, SOC 2, Type II report annually during the term of this contract.

Where respondents propose systems that are not reliant on offsite infrastructure (cloud hosting), SOC-2 is not necessary.

Comply. See **Exhibit E** for Motorola's SOC 2 report.

2.46 Warranties of Usage

Any estimated quantities listed are for information and tabulation purposes only. No warranty or guarantee of quantities needed is given or implied. It is understood that the Contractor will furnish the City's needs as they arise.

Understood

A change in Software or Equipment quantities, or Services, may affect the overall Contract Price, including discounts if applicable.

2.47 PCI (Payment Card Industry) Compliance - N/A

2.48 Remedies

Remedies shall be part of any Contract awarded and negotiated with the Successful Vendor.

Comply

2.48.1 The scope of these remedies will become part of a negotiated contract and shall minimally include a graduated set of monetary penalties for unexcused late or delayed performance by the Contractor.

Comply

2.48.2 The project schedule's indicated completion date shall be the basis for assessment of completion remedies.

Understood

2.48.3 Remedies shall be applied as follows:

Understood

2.48.3.1 Unexcused project completion delays of between 1 day and 30 days beyond the Contract's indicated completion date shall be assessed a penalty of $1,000 per day.

Understood

2.48.3.2 Unexcused completion delays that extend from Day 31 through Day 70 beyond the Contract's indicated completion date shall be assessed with a penalty of $1,500 per day.

Understood

2.48.3.3 Unexcused completion delays beyond 70 days shall be assessed as a remedy of $2,000 per day.

Understood

2.48.3.4 Any unexcused project completion delay that exceeds 180 days from the Contract's indicated completion date shall trigger an automatic default of the Contract.

Understood

2.48.3.5 If the Contractor is unable to cure the reason for its completion failure within 45 additional days, the Contract will self-cancel and the Owner will initiate action against the Contractor's performance bond unless some acceptable accommodation is reached by the Contractor with the Owner. During the 45-day default period, remedies will be assessed at the rate of $3,000 per day. Remedies shall also apply to warranty repair service.

Understood

2.48.3.6 The RFP and its subsequent contract with the Successful Vendor will include a mandatory warranty period where repair services performed in the field will be necessary. This RFP contains response time periods within which the Contractor is required to provide services and materials. A failure to perform on the part of the Contractor to meet its contracted response time requirements shall result in a financial penalty of the scope and amount indicated by this RFP or as modified during contract negotiations.

Understood



Section 3. SECTION III - TECHNICAL SPECIFICATIONS/SCOPE OF SERVICES

3.1 Project Requirements

3.1.1 Project Manager

3.1.1.1 City will assign a Project Manager as a single point of contact between the City and the Consultant. Proposer's Project Manager shall be approved by the City or designee prior to assignment.

Understood

*Attach supporting Project Manager documentation for this section.

Comply. See **Attachment 1 – 3.1.1.1 Project Manager Resume**.

3.1.1.2 The City reserves the right to require replacement of the Proposer's Project Manager or its Sub-Contractors at any time during the project should those party's specific workmanship fall below Industry-accepted levels and/or where mandatory project submittals are deficient, are of poor quality or are materially delayed.

Comply

3.1.2 Project Team

3.1.2.1 The vendor shall provide resumes of all project team members assigned to this project.

Comply

*Attach Project Team Members supporting documentation for this section.

Comply. See **Attachment 2 – 3.1.2.1 Project Team Members**.

3.1.3 Subcontractors

3.1.3.1 It is intended that a single City have total turnkey responsibility for the subsequent City project so as to ensure a successful radio deployment project.

Comply

3.1.3.2 Therefore, any Vendor desiring to use Sub-Contractor (s) must include within their response a list and description of potential, qualified Sub-Contractors).

Comply

3.1.3.3 The City requires documentation and references to ensure the qualification of a proposed Sub-Contractor.

Comply

*Attach Subcontractor Description and Qualifications Documentation: File Attachment

Comply. See **Attachment 3 – 3.1.3.3 Subcontractor Disclosure and Description & Qualifications.**

*Attach Subcontractor Disclosure Form.

Comply. See **Attachment 3 – 3.1.3.3 Subcontractor Disclosure and Description & Qualifications.**

3.1.4 Vendor Standards

3.1.4.1 The Proposer must have delivered and installed at least three projects including radio equipment of comparable technology (700/800 MHz Project-25 TDMA) having comparable size, scope, and with similar features from a manufacturer that has delivered equipment and software for at least three similar projects.

Comply

A. These three radio deployments shall be described with enough information that the City and its Consultant can reasonably determine their project equivalency.

Comply

B. RFP responses must include a detailed summary of the radio deployment and its significant operational features/components, as well as a current Contractor contact, including name, address, and phone number, title, department, and their responsibility.

Comply

*Attach Information on Project 1.

Comply. See **Attachment 5 – 3.1.4.1 Project Information.**

*Attach Information on Project 2.

Comply. See **Attachment 5 – 3.1.4.1 Project Information.**

*Attach Information on Project 3.

Comply. See **Attachment 5 – 3.1.4.1 Project Information.**

3.1.4.2 Vendors will likewise be required to provide sufficient information necessary to support claims that proposed radio equipment will be functionally and operationally compatible with public safety 700MHz channels (764-767MHz and 773-776MHz, paired with 794- 797MHz and 803-806MHz, respectively) as well as the newly configured 800MHz NPSPAC channel plan as a result of FCC-Ordered 800MHz Rebanding.

Comply.

The frequencies from 764 to 768 MHz and 794 to 798 MHz are reserved under FCC rules for broadband use, and in 2012 were specifically established for FirstNet use under federal law.

The offered radio equipment is narrowband equipment, and supports the frequency bands 768-776 MHz, 796-825 MHz, 851-870 MHz. These frequencies cover the entirety of the band plans authorized by the FCC for public safety narrowband use.

3.1.4.3 Failure to propose equipment capable of operations on this new spectrum and/or unable to support Project-25 Phase 1 and Phase 2 operations shall be considered non-responsive, and that Vendor's response shall be given no further consideration.

Comply

*Attach Required Documentation.

Comply. See **Attachment 8 – 3.1.4.3 Equipment Capable of Operations.**

3.1.4.4 The following standards shall apply, as a minimum, to all equipment, installation methods and materials:

Comply

a. EIA/TIA-Electronic/Telecommunications Industry Association

Comply

b. NEC - National Electric Code

Comply

c. NEMA - National Electrical Manufacturer's Association

Comply

d. IEEE - Institute of Electrical and Electronic Engineers, Inc.

Comply

e. FCC - Federal Communications Commission

Comply

f. FAA - Federal Aviation Administration

Comply

g. NFPA - National Fire Protection Association

Comply

h. International Building Codes for State where project is located

Comply

i. OSHA - Occupational Safety and Health Administration

Comply

j. (R56) Motorola Standards and Guidelines for Communications Sites or equivalent

Comply

k. ISO - International Organization for Standards

Comply

B. A factory authorized service center that is fully staffed and trained to support the proposed radio equipment, and all related features, and accessory equipment, must be located within a 120-minute (2 hour) response time of the City to be considered adequate to satisfy initial installation, configuration, warranty and ongoing maintenance needs.

Exceeds

Motorola exceeds this requirement and has a FSO (Field Service Organization) located in Plantation, Florida, which will provide initial installation, configuration, warranty and ongoing maintenance needs. Motorola also has 13 badged FSO employees within the region to support warranty and maintenance needs within the 2 hour response time.

*Attach Information about service and support.

Comply. See **Attachment 9 – 3.1.4.5 Information About Service and Support.**

1. The Contractor and all envisioned subcontractors, if any, must be able to legally conduct business within the State of Florida.

Comply

3.1.5 Warranty / Ongoing Maintenance and Support

3.1.5.1 Fort Lauderdale requires, at a minimum, a three-year (36-month) comprehensive warranty (maintenance and support) on all infrastructure and end-user equipment required by the new P25 radio system.

Exceeds

Motorola exceeds this requirement and has included a 4-year (48-month) comprehensive warranty on all infrastructure equipment.

A. The Warranty term will commence upon Final System Acceptance.

Comply

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

B. Ongoing Maintenance and Support will commence upon expiration of the initial three-year comprehensive warranty period and will continue in conjunction with the remainder of the first five (5)-year term and renewable with the remaining three (3) five (5)-year terms.

Comply

*Attach Maintenance Program Description and Timeline

Comply. See **Attachment 10 – 3.1.5.1 Ongoing Maintenance and Support Program Description and Timeline.**

3.1.6 Warranty of Performance

3.1.6.1 The Vendor acknowledges by submitting a response, that it has carefully reviewed the functional requirements and warrants that the proposed radio features shall function according to equipment specifications, industry standards, and the minimum operative characteristics specified herein in this RFP.

Comply

3.1.6.2 Radios certified by the factory shall be tested in the field for all relevant operations based on the features and functions included in the proposal response.

Comply

3.1.7 Workmanship

3.1.7.1 All proposed workmanship supportive of the RFP must conform to normal and accepted standards for the telecommunications industry.

Comply

3.1.7.2 All electrical wiring, antennas, mounts, etc. are to be installed by or under the supervision of the Contractor.

Comply

3.1.7.3 The Contractor must completely remove and properly dispose of residue due to its work, return the vehicles and site to a usable state each day and will be responsible for the cost of repairing all damage caused by the Contractor or its Sub-Contractors during equipment installation.

Comply

3.1.7.4 The City and/or its Consultant reserves the right to halt any radio equipment or civil installation process due to poor workmanship, housekeeping, scheduling, work interruptions, etc.

Comply

3.1.7.5 Work halts that are the result of poor workmanship would not relieve the Contractor of their responsibility to conform to the installation time requirements as stated by Contract.

Comply

3.1.8 Project Timeline

3.1.8.1 The Project's anticipated time frame for completion is no greater than eighteen (18) months from a formal Notice to Proceed.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Exceeds

As part of the Q&A, the City of Fort Lauderdale mentioned "The project should be completed within 24 months of contract execution." Motorola EXCEEDS this requirement and will complete the implementation of the new Radio System within 18 months from Notice to Proceed, barring any delays from the City of Fort Lauderdale.

3.1.8.2 The project should be completed within twenty-four (24) months of contract execution.

Comply. See **Attachment 11 – 3.1.8.3 Project Timeline.**

3.1.8.3 The Project will not be deemed completed until all radio equipment has been installed; all training has been completed; receipt of configuration documentation has occurred; and a Certificate of Substantial Completion has been issued by the City for any remaining punch list items.

Comply

*Project Timeline: Summary

Understood. See **Attachment 11 – 3.1.8.3 Project Timeline.**

*Project Timeline: Full

Comply. See **Attachment 11 – 3.1.8.3 Project Timeline.**

3.1.9 Materials

3.1.9.1 All equipment, except with the expressly written permission of the City and its Consultant, must be new and unused, meet telecommunications industry standards, and, where applicable, be registered with and approved by the Federal Communications Commission.

Comply

A. The City and its Consultant reserve the right to reject and require the return, at the Contractor's expense, of any defective components that fail to comply with this RFP or lack FCC type approval.

Comply

B. Rejections of material for cause would not provide an extension of time to the Contractor in the performance of contracted requirements. Such rejections or returns will neither validate nor invalidate the remainder of any Contract.

Comply

*FCC Type Acceptance for Proposed Equipment

Comply. See **Attachment 13 – 3.1.9.1 – FCC Type Acceptance for Proposed Equipment.**

3.1.9.2 Vendors must indicate any special requirements, i.e., architectural, mechanical, electrical, including electrical grounding, civil or structural modifications, that their equipment may need at either City-owned or non-City-owned locations or in vehicles that are intended to have new equipment installed.

Comply

A. Costs for these special requirements shall be clearly identified and disclosed specifically in the RFP Response.

Comply

B. Failure to ask questions on special requirements or provide costs can result in a proposal being scored down or deemed non-compliant.

Understood

C. Failure to provide costs does not omit the special requirements; work must still be performed by the Contractor at no additional cost.*

Comply. Motorola Solutions has accounted for all requirements as defined in Attachment 17, which includes our solution description. All relevant costs for items mentioned in Attachment 17 are included in our price proposal.

*Attach List of Special Requirements

Comply

See **Attachment 14 – 3.1.9.2 List of Special Requirements.**

3.1.10 Parts Availability

3.1.10.1 All proposed radio equipment and antennas and repair parts shall be commercially available for at least fifteen (15) years following the date of Final Acceptance.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Comply with Clarification

Motorola's goal is to provide parts and service support for five (5) years from product cancellation for portables and mobiles and for seven (7) years from product cancellation for fixed products. Consistent with this goal. Motorola will use commercially reasonable efforts to provide replacement parts for Motorola manufactured subscriber equipment for five (5) years and for Motorola manufactured fixed infrastructure equipment exclusive of third-party IT equipment (e.g. computers, switches, etc.) for seven (7) years, both from the date of last manufacture. Motorola reserves the right to supply either assemblies or piece parts. As long as the City of Fort Lauderdale stays on a current maintenance plan & upgrade agreement, the infrastructure will be supported for repair and replacement.

3.1.10.2 All proposed system and backbone infrastructure components, inclusive of microwave/backhaul equipment and repair parts shall be commercially available for at least fifteen (15) years from the date of Final System Acceptance.

Comply

Motorola Solutions will make all reasonable efforts for third-party and Motorola Solutions manufactured equipment, and will ensure that the technology and lifecycle plan is maintained yearly within the City of Fort Lauderdale Lifecycle and Services Agreement.

3.1.10.3 In the event any required part becomes unavailable after best effort to supply said part during the specified fifteen (15) year period, the Contractor may provide a suitable replacement or upgraded component, provided that:

A. The replacement maintains full functionality and usability with the existing system; and

Comply with making commercially reasonable efforts to maintain existing or comparable functionality.B. The replacement cost does not exceed the cost of the original part had it remained commercially available.

Comply provided the City maintains continuous service coverage as quoted throughout the term of the contract.

3.1.10.4 Parts availability shall be irrespective of status of a maintenance contact.

Comply with Clarification

Motorola's goal is to provide parts and service support for five (5) years from product cancellation for portables and mobiles and for seven (7) years from product cancellation for fixed products. Consistent with this goal. Motorola will use commercially reasonable efforts to provide replacement parts for Motorola manufactured subscriber equipment for five (5) years and for Motorola manufactured fixed infrastructure equipment exclusive of third-party IT equipment (e.g. computers, switches, etc.) for seven (7) years, both from the date of last manufacture. Motorola reserves the right to supply either assemblies or piece parts. Best effort for availability will apply after these timelines.

3.1.11 Decommissioning of Old Equipment

3.1.11.1 The Contractor must remove the existing system, backhaul, and user subscriber radios as approved by the Customer.

Comply

As mentioned in the Q&A, subscriber radios are to be proposed optionally and thus the removal has not been included as part of the base system.

3.1.11.2 These costs and related engineering services must be included in the RFP Response Pricing Pages.

Comply

3.1.12 Training:

The City considers training to be of paramount importance.

Understood

3.1.12.1 Telecommunicator training shall be more extensive and will involve all designated regular and relief telecommunicators employed by the City at the time of system operational testing.

Exceeds

Motorola Solutions exceeds this requirement by including – at no cost to the City of Fort Lauderdale – a one-year cloud-based and centrally hosted Learning Subscription for up to 5 users with unlimited access for 1 year. A Learning Subscription allows each agency to scale the subscription to its own needs. Subscriptions are offered yearly and include unlimited access to self-paced online training for one preferred technology. Additional product technology hubs can easily be added as your needs evolve. Subscriptions include specific learning experiences based on your team’s roles. Plus, our learning management platform allows quick assignment of online or in-person training sessions and develops tailored curricula, with deep tracking and reporting capabilities.

3.1.12.2 Administrative and telecommunicator training shall be completed onsite by the Contractor's personnel.

Comply

3.1.12.3 The Contractor shall provide administrative training for five (5) Communication Network Managers.

Comply

3.1.12.4 Software training shall be provided which will enable these personnel to perform functionality/feature changes to fixed site equipment and portables/mobiles, poll the network diagnostics perform traffic and feature usage studies, etc.

Comply

3.1.12.5 It is the desire of the City and Partner Agencies, Wilton Manors Police Department and Oakland Park Public Works, that such training commences within 60 days upon completion of contract approval by the Fort Lauderdale, FL Board of Commissioners and final execution, and be completed prior to Fort Lauderdale, FL Comprehensive Design Review (CDR) meeting or a suitable time as desired by the City.

Comply

3.1.12.6 Refresher training shall be offered prior to system cut-over as required by the City. This cost shall be included in the pricing pages. Cost of unused training shall be applied as a credit to the contract after final system acceptance.

Comply

3.1.12.7 Additionally, the Vendor shall develop and train radio system telecommunicators in the proper operation of radio console and backup control station equipment, as is necessary to operate the new P25 trunked radio system.

Comply

3.1.12.8 The Vendor shall coordinate all training, and all sessions must be approved by the City.

Comply

3.1.12.9 Vendor shall work with City staff on training room availability on City property first before reserving off campus facilities.

Comply

3.1.12.10 Administration, maintenance personnel, and network manager follow-up training shall be provided and scheduled no more than sixty (60) days after project completion for the purpose of training reinforcement.

Comply

3.1.12.11 All training costs, direct or indirect, such as meeting rooms, instructor travel, lodging and transportation, must be included in the final proposed price.

Comply

3.1.12.12 Additionally, the Vendor must provide comprehensive maintenance training for five (5) people, whereby the City’s service/support personnel are qualified in the proper diagnostic, maintenance and repair service skills needed to quickly resolve 700/800MHz communications equipment malfunctions as well as microwave backhaul operational problems.

Comply

3.1.12.13 The Vendor is required to provide operational and full maintenance training for all City service/support personnel, either on site or at remote factory locations.

Comply

3.1.12.14 This level of training will be essentially equivalent to the level of service training required by the Vendor for its employed maintenance providers.

Comply

3.1.12.15 Additionally, the Vendor must develop and train City service/support personnel in those aspects of maintenance necessary to ensure the highest availability and reliability of infrastructure resources.

Comply

3.1.12.16 The Vendor shall be responsible for all travel related costs associated with vendor and City service/support personnel traveling outside of the service area for training.

Comply

3.1.12.17 Preventative maintenance training shall encompass all elements of proposed infrastructure equipment, inclusive of base stations, trunking controllers, network switches, microwave backhaul, standby generator equipment, battery plants, battery charging systems, tower light systems, site grounding systems, alarm systems and all other subsystems directly or indirectly related to infrastructure reliability and operations.

Comply

3.1.12.18 This maintenance alternative should also include a full complement of test equipment to provide the services as required by the maintenance training.

Comply

3.1.13 Parallel Implementation

3.1.13.1 In developing RFP responses, Vendors must consider that the new land mobile radio system must be installed in parallel with the existing radio system.

Comply

3.1.13.2 The current system is the Customer's only Public Safety Voice communications system and must operate 24/7/365.

Comply

3.1.13.3 No interruptions in service of any duration may be allowed without prior approval of the City or their designee.

Comply

3.1.13.4 Therefore, fully duplicated voice radio systems will coexist for some time

Comply

3.1.13.5 Remedies similar to those listed in section 2.28 in this RFP apply if radio operation is disrupted beyond scheduled installation services.

Comply

3.1.14 Acceptance Testing Process

3.1.14.1 Acceptance testing procedures will be defined during Contract Negotiations.

Understood

3.1.14.2 These procedures shall test and verify the performance of the hardware/software features; coverage performance on the existing system; reliability and interoperability with neighboring jurisdictions.

Comply REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

A. A field certification completed prior to deployment run on the same equipment expected to be used for preventative maintenance during the warranty and maintenance periods of the contract.

Comply

B. The field certification shall include 100% of radios included in the proposal response. This includes an auto test and auto tune.

Comply

As part of an option, Motorola has proposed new subscribers. These point-by-point responses are only applicable if new subscribers are purchased. Auto Test and Auto Tune can be provided optionally.

1. Vendor shall provide documentation on each radio upon completion of field certification.

Comply

2. Vendors shall include in their sample test plan attached to this section, the minimum data points they will document as part of this acceptance test plan.

Comply

C. System Acceptance Test shall minimally include:

Understood

1. A Factory Staging Verification of System and network functionality;

Comply

2. An installed determination of compliance with Industry standards and published RFP requirements of the various equipment elements provided under the Contract;

Comply

3. Functionality of standby power systems;

Comply

4. Functionality and path reliability of microwave link segments and the overall network as a whole;

Comply

5. A successful completion of a set of voice quality and signal level coverage tests of sufficient scope to confirm that the outdoor, in-vehicle and in-building coverage required by the Contract has been achieved;

Comply

6. Completion of a mandatory 30-day reliability burn in absent of any major network failures (i.e., loss of tower site, loss of 25% of network capacity, unreliable m/w functionality, etc.). All major failures will result in a restart of the 30-day reliability burn. Restart of burn in test shall commence within thirty (30) days of failure.

Comply

D. The Radio Acceptance Test shall minimally encompass:

Comply

1. A bench test of all required functions and features listed in this RFP.

Comply

2. An installed determination of compliance with Industry standards and published RFP requirements of the various radios provided under the Contract;

Comply

3. Functionality of various charging systems;

Comply

4. A successful completion of a set of voice quality and signal level coverage tests of sufficient scope to confirm that the outdoor, in-vehicle and in-building coverage has not been negatively impacted by the new equipment;

Comply

5. Test of accessory equipment

Comply

*Attach Sample Acceptance Test Plan

Comply. See **Attachment 15 – 3.1.14.2.D Sample Acceptance Test Plan.**

3.2 Identified User Needs and Requirements

3.2.1 General

3.2.1.1 The intent of this RFP is to provide a P25 700/800 MHz Digital Simulcast Trunked Mobile Radio System that shall include multiple tower sites provided with equipment shelters, generators, and additional site hardware, including HVAC to support the Vendor's proposed infrastructure.

Comply

3.2.1.2 New buildings must accommodate all proposed radio/microwave equipment, battery plants, DC power supplies, and ancillary equipment as necessary.

Comply

3.2.1.3 The Vendor shall be responsible for conducting tower and foundation or rooftop structural analysis and reinforcement as necessary to any of the existing radio towers in use by the City. This includes structural analysis of any rooms inside existing buildings that may be used to store equipment operating on the roof of the building.

Understood

3.2.1.4 Vendors are required to propose a comprehensive set of equipment and services that satisfy this RFP's minimum requirements and are encouraged to describe specific areas within their proposal solutions that materially exceed these minimum objectives.

Understood

3.2.1.5 Since the existing radio system exhibits a lack of reliable portable in-building radio coverage Citywide, the Vendor shall propose new tower sites (in addition to the current locations) as necessary to satisfy the coverage requirements listed within this document.

Understood

3.2.1.6 Section 3.38 Site Work Requirements, provides for specific workmanship standards for communications facilities that must be met by the Contractor in the course of constructing the system.

Comply

3.2.1.7 This RFP provides a baseline of technical requirements coupled with functional objectives that must be considered by responding Vendors.

Comply

3.2.1.8 RFP allows flexibility in the selection of sites and antenna placements by responding Vendors such that their response fully addresses the coverage reliability/audio quality requirements contained in Section 3.13 Coverage Criteria.

Understood

3.2.2 Current Usage Requirement

3.2.2.1 A comprehensive radio system study has been previously undertaken.

Understood

3.2.2.2 A summarized detail of user needs, and expectations follows:

Understood

A. Improved Coverage

Understood

1. The greatest area of concern communicated during the various user interviews was the lack of coverage being provided to support operations. Mobile and portable radio coverage deficiencies are reported by the users to exist in multiple areas throughout the customer service area defined in section 3.15 Service Area.

Understood

2. The Customer desires that the radio system coverage be improved to meet best practices in Public Safety. Vendors can find a complete list of the coverage requirements in Section 3.13 Coverage Criteria.

Understood

B. Current Operable Aspects

Understood

1. City's agencies utilize the existing Land Mobile Radio System for daily communications as defined in Appendix A: Current Infrastructure.

Understood

2. The dispatch center consoles are identified in Appendix A: Current Infrastructure.

Understood

3. Interoperability requires sharing radios with neighboring agencies such as mutual aid, city, county, and state agencies.

Understood

a. An ISSI gateway connects the current P25 system to the dispatch consoles.

Understood

This functionality must be maintained by the proposed system.

Comply

b. The subscriber radios used by the end users are identified in Appendix A: Current Infrastructure.

Understood

C. Typical Current Radio User Configuration

Understood

1. Most users are equipped with hand-carried portable radios. These radios are operated on-hip, some with an accessory speaker-microphone device installed. While a leather carry case is sometimes used, most simply clip the radio to their belts. This configuration allows good positioning flexibility yet exposes the radio to more physical damage as compared to radios holstered into leather carry cases.

Understood

2. Historically, radios have been without a preventative maintenance plan and are repaired on a 'break-fix' basis only.

Understood

3. Radio ergonomics are important to users, which is one reason why an electrically shortened antenna configuration for portable radio units has been defined in Section 3.13 Coverage Criteria.

Understood

4. Feature available for use by the system already enabled in the radio subscribers includes:

Understood

a. Emergency Button

Understood

3.2.3 System General Objective

3.2.3.1 Talk Paths

A. Each of the agencies operable within the current LMR radio system utilize individual talk paths that are used for existing operations.

Understood

B. Additional information may be obtained from Appendix B: Existing Channel Structure.

Understood

C. The Vendor shall ensure the P25 radio talk path needs for the system will include triple (3x) those of the existing configuration, plus a net 25% growth/expansion potential of actual in-service talk paths shall be made available.

Exceeds

Based on previous guidance from the City, Motorola Solutions will use a baseline of 28% higher busy hour traffic than the worst busy hour before applying the 25% growth factor. Further details of our traffic modeling can be found in our Solution Description in Section 1.1.9.

D. The current radio configuration’s talk-group structure is described in Appendix B: Existing Channel Structure.

Understood

3.2.3.2 Call Privacy

A. The replacement P25 Land Mobile Radio System shall include voice-layer encryption (described herein).

Comply

B. This provision must offer sufficient flexibility such that the desirable features of monitoring shall be retained while permitting privacy to confidential conversations.

Comply

C. The new network should be software-configurable to support the P25 control channel encryption standard as developed by TIA. ANSI/TIA 102.AABB, P25 Trunking Control Channel Formats, May 2002.

Comply with Clarification

The Link Layer Encryption service for P25 impacts many published P25 standards. The architecture for this new service is being developed in the APCO Project 25 Interface committee's (APIC) Encryption Task Group (ETG). The ETG is drafting several documents that describe how the LLE service will operate over FDMA and TDMA Air Interfaces and how that service will impact published standards. As a P25 product and service provider, Motorola Solutions works closely with the Telecommunications Industry Association (TIA) to ensure our products continue to meet the TIA-102 series of standards for APCO P25. Motorola Solutions cannot guarantee that a hardware change will not be required by the final P25 standards when a control channel encryption standard is developed.

D. This document defines the format of trunking control channel transmission for P25 systems.

Understood

E. The formats are compatible with the Common Air Interface defined by ANSI/TIA/EIA102.BAAA and both encrypted and non-encrypted formats are defined.

Comply with Clarification

The Link Layer Encryption service for P25 impacts many published P25 standards. The architecture for this new service is being developed in the APCO Project 25 Interface committee's (APIC) Encryption Task Group (ETG). The ETG is drafting several documents that describe how the LLE service will operate over FDMA and TDMA Air Interfaces and how that service will impact published standards. As a P25 product and service provider, Motorola Solutions works closely with the Telecommunications Industry Association (TIA) to ensure our products continue to meet the TIA-102 series of standards for APCO P25. Motorola Solutions cannot guarantee that a hardware change will not be required by the final P25 standards when a control channel encryption standard is developed.

F. Vendor shall describe the scope and operation of such provisions inherent or planned within their solution that prevents the types of undesired radio monitoring discussed above.

Comply

Over many years of working closely with State and local governments and U.S. Federal agencies, our ASTRO development team has developed a comprehensive understanding of Information Assurance (IA) requirements as applicable to P25 systems. Based on this strong understanding of customer's security needs, we incorporate the voice encryption security measures in our ASTRO 25 systems as set forth in the next section.

3.2.3.3 Voice Encryption

A. Digital voice 256-bit Advanced Encryption Standard (AES) encryption, using Advanced Multi-Band Excitation +2 (AMBE+2 or newer) vocoder technology coupled, shall be included in the system. Encryption shall be FIPS 140-3 compliant.

Exceeds

The APX family of radios EXCEEDS this requirement by utilizing the Motorola Advanced Cryptographic Engine (MACE) chip. The MACE is an on-board radio encryption device providing cryptographic services for all voice and data communications. It also provides a secure environment for storing encryption keys via a hardened tamper-resistant chassis. The MACE has the capability to not only store the City's encryption keys but will also protect those keys from being accessed by unauthorized users through physical or electronic means. Any physical disruption of the MACE chip automatically triggers the radio to erase all key material.

This capability allows the APX N-Series family of radios to meet Federal Information Processing Standard Publication (FIPS) encryption standards FIPS 140-3 Level 1 and Level 3 and FIPS 197. APX series P25 two-way radios are the only radios in the industry that meet the FIPS 140-3 Level 1 and Level 3 validation.

B. Three modes of encrypted digital voice operation expected are:

1. Unit-to-unit, where conversations transacted in an encrypted talk group are secure. These cannot be monitored at a dispatch or control point;

Comply

2. Telecommunicator-to-unit, where conversations between the Customer's dispatch center(s) and field units.

Comply

3. P25 Smartphone Application call transactions (via commercial cellular and FirstNet) to typical field/telecommunicator operations within the system.

Comply

C. The enhanced P25 System shall provide encrypted transmission functionality so that user radio access delays are equal to those in the clear (non-encrypted) mode to comply with published TIA P25 standard specifications.

Comply

D. Encrypted transmissions shall not degrade the operation of clear-voice features nor lengthen system access or audio transport delays to other users.

Comply

E. Encryption shall not impair the range of coverage to any level less than that for typical P25 clear-mode digital performance.

Comply

3.2.3.4 End User Equipment

A. Requirements for end-user equipment and training is detailed in Section 3.42 Minimum Subscriber Requirements and Price Considerations.

Understood

3.2.3.5 Gateway and ISSI Interfaces

A. The utilization of gateway technology is necessary for the System and provides a useful and important function in the integration of outside trunked and non-trunked radio systems. Interoperability.

Understood

B. Further requirements are provided in Appendix I: Interoperability Needs.

Understood

C. Base Station Gateway technology shall be provided to interface both analog and digital land mobile radio base stations, on a talkgroup or channel basis, within the P25 trunked solution.

Comply

D. By so doing, it would then be possible for radio users equipped with P25 radios operable on the System to select, monitor and individually control these various link- radio resources.

Comply

E. Broadband Gateway functionality shall be provided within the System to permit selected outside third-party Smartphone users equipped with the appropriate application software to communicate with users/agencies via allowed System talkgroups.

Comply

F. Inter RF Sub-System Interface (ISSI) technology and associated cost shall be provided which allows P25 core controllers of disparate radio systems to transact communications across systems/technologies.

Comply

G. Customer requires the implementation of each of these gateway technologies as part of the Vendor's proposed configuration as further described by RFP Section 3.9 Minimum Equipment Requirements.

Understood. See section 3.4.11.2 for more information on gateway technologies.

3.2.3.6 Roaming

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

A. The Vendor's solution shall support future seamless agency user roaming across jurisdictional boundaries via ISSI connections.

Comply

The proposed CriticalConnect (ISSI) solution provides automatic roaming without the need for users to physically change systems or talkgroups.

B. Functionally, a field radio user who initiates and is in communication with telecommunicators or others on a specific talkgroup within a specific P25 radio system must remain affiliated with those parties while driving across the coverage footprint of ISSI-linked P25 systems.

Exceeds

Motorola Solutions exceeds this requirement. Proposed in this response is Critical Connect, which provides additional feature sets above the ISSI standard.



Figure 2-1: Critical Connect

C. This roaming feature must operate automatically without the need for field users to physically change systems/talk-groups while traversing across tower site/system coverage zones.

Comply

D. The Vendor shall describe radio user roaming functionality within its proposal. This description shall include an explanation of the process used by user radios to determine when to transition onto the next system, in conjunction with an explanation of radio availability while this ongoing adjacent-system availability determination is underway. Next systems are defined as the same manufacturer P25 cores with similar or different software/hardware revisions to other manufacturers P25 cores.

Comply

Subscribers that are enabled for automatic inter-system roaming can register on a foreign system that supports registration of foreign subscribers. When the subscriber registers in a system that is not its home, it provides its WACN ID, System ID, and Unit ID. The WACN ID and System ID enable the Inter-System Gateway (ISGW) to determine the IP address of the home system's ISSI interface. Upon a registration from a foreign radio, the ISGW sends the registration request to the home system. If the foreign radio is already registered, it can roam between sites in the same system without involving the home system.

A Motorola Solutions subscriber with system roaming capability will indicate on its display that it is roaming outside its home system.

There are three methods of finding a control channel in a different system:

- Foreign Adjacent Status Broadcasts.
- Programming the foreign control channel(s) in the radio.
- Full spectrum scan.

Foreign Adjacent Status Broadcast is the quickest method of finding a new control channel. The full spectrum scan is the slowest method.

The Foreign Adjacent Status Broadcasts can advertise control channels in systems with different frequency band plans from the local system. In this case, the foreign frequency band plan is advertised as well. Unlike same system Adjacent Status Broadcasts, Foreign Adjacent Status Broadcasts are not based on the health of the adjacent control channels, but only on the pre-configuration of foreign channels in the local system. The health of control channels is not conveyed between systems. Only one control channel per foreign site will be advertised. This should be that site's primary control channel. If the foreign site is using a different control channel, it will not be advertised at the adjacent systems.

When auto-roaming to a different vendor that does not have a preferred control channel (i.e. a control channel that is always used except in the case of channel failure or being forced out of service), or a control channel that can arbitrarily roll over to a different frequency, it is recommended that the list of available control channels be programmed into the home system's subscribers. Motorola Solutions APX subscribers support this capability. This allows for speedy re-acquisition of a control channel in the visited system, without reliance upon a full spectrum scan.

The full spectrum scan can take several minutes, and is not a practical solution for frequent roaming between systems. The full spectrum scan would generally only be used when a subscriber enters the coverage area for a new system that is not adjacent to its previous system and whose control channel frequencies were not configured in the code-plug.

In general, when a subscriber roams to a new system during an active call on a talk-group, the subscriber will be dropped out of the current transmission but will be joined to the call on the next transmission.

When the first radio or console affiliates to a foreign talk-group, the ISGW sends a talk-group registration message across the ISSI link to the talk-group's home system. This enables the talk-group's home system to include the radio or console in the foreign system in future PTTs on the talk-group, and to accept calls across the ISSI link. (If the home system does not allow the talk-group affiliation, the radio is not allowed to affiliate at the site.) Subsequent affiliations to that talk-group from other devices can be processed without being sent to the home system.

A foreign talk-group can be assigned and monitored on a Motorola Solutions console. When the first radio or console affiliates to a foreign talk-group, the ISGW sends a group registration message across the ISSI link to the talk-group's home system. This enables the home system to include the console in future PTTs on the talk-group, and to accept calls from the foreign console across the ISSI link. (If the home system does not allow the talkgroup affiliation, the console user will be notified that it was rejected.).

E. The need for a radio user to manually transition between tower site/system coverage zones within a Vendor's proposed network configuration is unacceptable. A manual approach shall be down-graded during the proposal evaluation.

Understood

3.3 Infrastructure System Configuration

3.3.1 General

3.3.1.1 The Customer has valid licenses for its current radio and microwave network, as outlined in Appendix E: FCC License.

Understood

3.3.1.2 The Contractor will be required to undertake necessary FCC license modifications, as required, to accommodate the modernized/expanded System.

Comply

3.3.1.3 Any frequency modifications and site additions will be coordinated with the Regional Planning Committee.

Comply

3.3.1.4 The vendor is responsible for providing a licensable system design subject to applicable local, state, regional, and federal laws.

Comply

3.3.2 System Configuration

3.3.2.1 The Vendor is required to provide a comprehensive, functional and technical solution for a new P25-compliant System. The new digital radio configuration shall utilize the necessary number of infrastructure sites, as determined by the Vendor, to meet the Customer's expressed coverage requirements as described in the Coverage Criteria section.

Comply

3.3.2.2 The system must be designed and deployed to utilize both P25 Phase 1 FDMA & P25 Phase 2 TDMA modulation formats.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Exceeds

Motorola Solutions exceeds this requirement.

Motorola Solutions has included both APCO Project 25 Phase 1 (FDMA) for all voice channels and Phase 2 (TDMA) for four (4) voice channels. Additionally, Motorola Solutions has included Dynamic Dual Mode (DDM) for the four voice channels that will be equipped for TDMA operation. DDM consists of both the Dynamic Talkgroup and Dynamic Channel features. Motorola Solutions' TDMA operation (Phase 2) compliments Phase 1 FDMA operation on the ASTRO 25 platform; it does not replace it. DDM allows the system to dynamically allocate a channel and talkgroup as FDMA or TDMA based upon the capabilities of the subscribers on the system.

The included four TDMA licenses allow the system to carry up to 13 voice paths, which are sufficient to meet the capacity and traffic requirements for the system. Our price proposal also shows optional, incremental pricing to add additional TDMA licenses to more of the voice channels, should the City wish to do so. (Note: In any TDMA expansion being contemplated, it is unnecessary to add TDMA licenses to the control channel.)

FDMA and TDMA Capability

Motorola Solutions has designed the simulcast system to operate with Dynamic Dual Mode (DDM) on four channels, which will dynamically switch those channels between Phase 1 FDMA and Phase 2 TDMA mode based on the type of call assigned to the channel. With DDM operation enabled, voice-calling capacity is increased over Phase 1 FDMA alone without having to abandon Phase 1 FDMA operational subscribers.

Dynamic Dual Mode (DDM) Feature

DDM allows users to interoperate between P25 FDMA and P25 TDMA services. It is part of the call processing application whereby the control channel dynamically switches call assignments between FDMA and TDMA.

Dynamic Dual Mode improves ease of use in ASTRO 25 systems with a mixed fleet of P25 FDMA and P25 TDMA radios. For example:

- Radio users have seamless interoperability, regardless of the operations mode.
- Dispatch operators can automatically coordinate between P25 TDMA radio users and P25 FDMA radio users, with no need to track or patch users together.
- System administrators do not need to pre-assign base stations as P25 TDMA or P25 FDMA; the system automatically assigns the appropriate station mode based on the needs of the user.

Dynamic Channel Assignment

Dynamic Channel Assignment provides efficient system operation by dynamically switching between P25 FDMA mode and P25 TDMA mode for a given station based on the needs for the call assigned to the station. A station can be configured as FDMA only, TDMA only, or Dynamic (FDMA/TDMA).

Dynamic Talkgroup Assignment

Dynamic Talkgroup Assignment provides seamless communication between systems with mixed FDMA and TDMA fleets of radio users by automatically assigning talkgroups to FDMA or TDMA modes of operation, depending on the capabilities of the affiliated subscribers. When a Dynamic Talkgroup has both Phase 1 FDMA and Phase 2 TDMA radio users affiliated with the system, and Phase 1 FDMA channel resources are available, the talkgroup call will be in Phase 1 FDMA mode requiring no user intervention. If the same talkgroup call has only Phase 2 TDMA radio users affiliated on the system, the call can take place in Phase 2 TDMA mode. Equipping the system with DDM allows the City to maintain seamless interoperability with other Project 25 Phase 1 and Phase 2 radios.

3.3.2.3 In addition, the system shall be capable of a five-channel 700/800MHz NPSPAC analog conventional mutual aid subsystem having the capability of being electronically patched to the system's 700/800MHz talk-groups via conventional base station gateway interfaces with the coverage requirements described the Section 3.13 Coverage Criteria.

Comply

3.3.2.4 The proposed system shall utilize both existing and Vendor-recommended radio infrastructure sites and shall include, minimally, a primary and secondary/ redundant network controller.

Comply

3.3.2.5 These network controllers shall be located at sites that provide a geo-redundant configuration to be mutually agreed between the Vendor and the Customer.

Comply

3.3.2.6 The Vendor shall indicate a guaranteed level of portable and mobile area coverage and delivered audio quality indicative of their designed solution.

Comply

3.3.2.7 The Customer recognizes that portable radio coverage to the same degree as required for mobile operations increases system complexity.

Understood

3.3.2.8 These requirements are outlined in Section 3.13 Coverage Criteria.

Understood

3.3.2.9 Physical plant modifications to newly-proposed tower sites, rental sites, existing Customer-owned sites, or the dispatch center(s) as necessary to accommodate the Vendor's proposed system configuration shall be the responsibility of the Contractor and must be clearly identified and factored into the Vendor's Cost Proposal.

Comply

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Motorola Solutions has included a site-specific Statement of Work in this proposal that describes the site modifications and construction scope that is included. Additional items that may be required will be handled with a Change Order. Motorola Solutions did perform site walks following the Prebid Conference on December 2, 2025, and came up with all required costs that we could determine during those site walks. Visits to the dispatch centers were not scheduled or permitted during that event.

3.3.2.10 The Vendor's failure to disclose physical plant modifications (and cost) is contrary to the Customer's turnkey project requirement and shall result in an unfavorable grade of the Vendor's proposal or non-compliant rating if not separately listed; all physical plant modifications and costs will be at the cost of the Contractor without a change order.

Comply with Clarification

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Motorola's proposed RFP compliant civil works scope of work is included in response to this RFP. Every lease tower is subject to additional cost required once tower structural analysis are performed by the tower owners based on the new microwave and RF antenna loads required. At this time we cannot provide actual cost or estimated cost on the new loading of the tower and any mitigation of a tower. Also, all electrical, grounding and civil associated with the current Dispatch Center and existing equipment rooms will be the responsibility of the Customer as those sites were not walked during the site walks.

3.3.2.11 The Vendor shall provide all pertinent information concerning their equipment, relative to electrical, mechanical, structural and physical space requirements.

Comply

3.3.2.12 The Vendor must consider enhanced physical security, cybersecurity, and environmental issues in preparing their response.

Comply

3.3.2.13 It shall be the responsibility of the Contractor to provide a turnkey system and to install Industry-accepted standard electrical grounding systems and lightning protection devices to protect proposed equipment from damage due to electrical transients on antenna systems, power, telephone and/ or control cables including upgrading existing facilities if the Contractor plans on reuse of any of those facilities in their proposal.

Comply

3.3.2.14 These facilities include all tower and dispatch center sites. This includes the ANSI/TIA/EIA222-H standard.

Understood

3.3.2.15 The Vendor shall identify in its Technical Response any proposed sites that may be subject to flooding. For each such site, the Vendor shall include documentation indicating the site's Federal Emergency Management Agency (FEMA) flood zone designation and status.

Comply

See Attachment 41 for FEMA Floodplain Documentation.

3.3.2.16 All engineering analyses and flood mitigation designs shall be based on the most current FEMA 100-year floodplain data available at the time of proposal submission.

Comply

3.3.2.17 Flood mitigation measures shall include, as necessary, elevating equipment shelters or other critical components such that all new equipment is installed at least twenty-four.

Comply

3.3.2.18 Vendors who fail to identify sites subject to this requirement shall, at their own expense and without entitlement to a change order, perform all necessary modifications to achieve compliance with this specification.

Comply. Motorola Solutions has accounted for all requirements as defined in Attachment 17, which includes our solution description. All relevant costs for items mentioned in Attachment 17 are included in our price proposal. Motorola has conducted a flood plain analysis for the Future State of Florida site, and included a raised platform for the new shelter to ensure flood risk mitigation. However, the Utilities site has an existing shelter that cannot be modified to include a raised platform.

3.3.2.19 The delivery and installation of equipment shelters, security systems, standby and emergency power systems, towers, antenna systems, electrical grounding systems, lightning protectors, transmission lines, cable attachment hardware, transmission line shields, tower-to-building cable tray hardware, and all necessary permitting is part of this project and must be furnished by the Vendor.

Comply

3.3.2.20 All transmit/receive site-related equipment is to be backhaul-connected via digital microwave linkages to be supplied by the Contractor.

Comply

3.3.2.21 The microwave backhaul layer shall be designed and configured as a monitored, hot-standby, loop-protected ring (or rings) interconnecting all radio tower sites, simulcast control points, dispatch centers, and network controller locations.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Comply

In full compliance to the RFP, Motorola has included the Backup Dispatch Site in the proposed microwave ring, facilitated by a proposed 80 ft monopole tower to be erected at the 2200 Executive Airport Way facility. The 80 ft monopole is necessary to achieve sufficient line-of-sight clearance for RFP-compliant, high-availability microwave paths. Due to its close proximity to the airport, any antenna structure being considered at this location will require an FCC filing and will trigger an aeronautical hazard study by the FAA. It is Motorola's opinion that an 80 ft monopole has a low likelihood of gaining FAA approval, judging from the minimal heights observed for nearby existing structures.

Motorola has therefore included contingency pricing for the Executive Airport Way facility to alternatively be connected by ASTRO Connectivity Services (which would bring a fiber circuit to the location, augmented by LTE backup) instead of microwave, in the event that FAA authorization for the monopole is denied.

3.3.2.22 Microwave paths utilizing a spur configuration shall be permitted only as an approved alternative or cost-savings option and shall not compromise overall network reliability or redundancy.

Comply

Spur paths have not been proposed.

3.3.2.23 The primary operating frequency band for the new microwave backhaul layer shall be 6 GHz.

Comply

3.3.2.24 Microwave links operating in the 11 GHz band shall be permissible only for path segments less than four (4) miles in length, and where path design criteria and reliability objectives can be fully maintained.

Comply

3.3.2.25 If 11 GHz licensing is unavailable, the vendor must prove that the required spectrum is unavailable and then provide solutions to ensure the proposed path will meet all the requirements outlined in the RFP.

Comply

Motorola Solutions anticipates that 11 GHz licensing will be available where needed.

3.3.2.26 The Contractor shall furnish and install all radios, antennas, wiring, wiring hardware, interface electronics and materials necessary, and at no additional cost than that identified in their Contract, to complete the successful implementation and operation of this system and its related equipment groupings.

Comply

3.3.2.27 All such work shall be included within the Contract Price, with no additional cost to the Customer.

Comply

3.3.3 System Planning and Capacity

3.3.3.1 The system shall support the Customer's current user capacity, three times the current channels/talkgroups plus no less than a 25% growth in net traffic.

Exceeds

Based on previous guidance from the City, Motorola Solutions used a baseline of 28% higher busy hour traffic than the worst busy hour provided by the City's previous traffic data, before applying the 25% growth factor. Further details of our traffic modeling can be found in our Solution Description in Section 1.1.9.

3.3.3.2 This will include all necessary, hardware, software, and frequencies.

Comply

3.3.3.3 Please refer to Appendix B: Existing Channel Structure for details.

Understood

3.3.3.4 The Contractor shall utilize best engineering practices in selecting the system's frequency plan to maximize the effectiveness of channel resources.

Comply

3.3.3.5 The proposed hardware and frequency plan must ensure that frequencies installed at sites cause no adverse receiver desensitization because of intermodulation products and, further, that the Contractor's frequency plan complies with FCC regulations with respect to co-channel and adjacent-channel interference protection criteria.

Comply

3.3.3.6 The Vendor's Technical Response must fully describe its frequency engineering process and must include an initial frequency plan for its proposed configuration (since differences between the Vendor's plan and the existing-system's frequency plan are anticipated).

Comply

3.3.3.7 The Vendor must describe its best-practice approach to the monitoring of noise floor levels/degradation at radio tower sites and the steps it would undertake to identify and resolve interference issues, both internal to the radio system's infrastructure, as well as external.

Comply. Refer to Section 3.13.3.3 for noise floor information.

3.3.3.8 The Vendor must provide a contingency plan, should the initial frequency plan not be available for implementation.

Comply

*Attach Contingency Plan REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Comply

The following information has also been provided in **Attachment 16 – 3.3.3.8 Contingency Plan** as directed by the RFP.

The published Region 9 Regional Planning Committee's Regional Communications Plan already allocates the 26 frequencies listed in Appendix B of the RFP, to the Fort Lauderdale area, and the City already holds FCC licenses for all 26 frequencies. This proposal only calls for the use of 10 of the 26 available frequencies already allocated to the City. While the FCC licenses will need to be modified to reflect the new design parameters and the use of TDMA modulation, there appears to be no risk that the proposed frequency plan will not be available for implementation. The coverage goals of the RFP will, however, require a waiver to the Region's rule which sets a 3-mile limit for the 40 dBu Protected Service Area Contour from the jurisdiction of the City/County.

3.4 Major System Equipment Groupings

3.4.1

The Vendor shall provide and shall describe, minimally, the following major equipment groupings as contained within the proposed configuration:

Comply

3.4.1.1 Radio Network Controller (Primary and Secondary)

Comply

The Core site is the central point for all system traffic in each ASTRO 25 zone. Call processing and system management occur at the core site. The Voice and Data call processing for the system is performed by the Zone Controller. The Zone Controllers maintain constant communication between the RF Sites, and Network Management (NM) sub–systems via the Network Transport Subsystem.

Core Site Zone Controller

The zone controller is used to process system–wide commands and handle call processing and mobility management functions for the system. The Zone Controller provides trunking call processing for ASTRO 25 system operation. The Zone Controller forms the heart of a wide–area radio system by providing the central processor for the zone, with the necessary hardware and software capabilities to provide call processing and mobility management.

The Zone Controller builds upon the strength and experience of Motorola Solutions wide–area trunking systems to deliver multiple layers of reliability for business–critical, Mission–Critical and life–critical applications.

The Zone Controller is supplied in a geo-redundant configuration in our proposal, by virtue of the main and backup core sites in the proposed system design..

3.4.1.2 Auxiliary power generators

Comply

3.4.1.3 Interoperability Link Base Stations

Comply

Motorola Solutions has provided 4-wire conventional gateways at each RF site, allowing the City to connect any existing or future conventional base stations that it may wish to deploy at these sites for interoperability purposes.

3.4.1.4 ISSI Gateways

Comply

3.4.1.5 Base Station Gateways

Comply

Conventional Channel Gateways (CCGW) connect dispatch operators to analog or digital conventional channels in the system. The MCG 8000 CCGW provides the interface between the IP network and conventional base stations by translating the voice and data into the format needed for each individual station type. The MCG 8000 supports circuit-based, serial, and Ethernet-based interfaces to conventional base stations. As equipped, each MCG 8000 supports eight (8) interfaces which can be analog-only or ACIM + analog interfaces.

3.4.1.6 Broadband Device Gateways

Comply

The proposal includes Critical Connect WAVE for Broadband PTT service, which acts as an extension of the LMR system. This maintains priority levels as they are on the LMR system, offering broadband users the same level of priority as LMR subscriber users.

WAVE is a cloud-based solution that enables interoperable PTT across devices, networks, and locations. Users receive instant, reliable PTT that extends communications beyond the coverage provided by an LMR system. WAVE Broadband PTT will include a broadband PTT server located at each core site with a Motorola Solutions CRYPTR device to provide encrypted voice services between the ASTRO P25 system and the WAVE clients.

3.4.1.7 Contractor shall furnish and install all wiring hardware, cable trays, interface electronics, terminal blocks, and materials necessary to complete the successful implementation and operation of this site and its equipment groupings.

Comply

3.4.1.8 Infrastructure equipment proposed for the Control Point must meet the minimum requirements specified by Section 3.9 Minimum Equipment Requirements.

Comply

3.4.1.9 The Vendor is required to incorporate a dual primary / redundant, geographically separated network control point design into its proposed infrastructure solution.

Comply

The proposed solution consists of a Primary Core (network control point) and a *Dynamic System, Resilience* (DSR) Core (redundant network control point).

Per Section 3.3.2.6 the locations of these sites are to be mutually agreed between the Vendor and the Customer, but for the purposes of this proposal and the dimensioning of the DC plant associated with each facility, Motorola proposes the use of the State of Florida Tower shelter and the Utilities tower shelter respectively.

3.4.1.10 This requirement is mandatory and an RFP Response failing to include such a dual-site redundancy configuration will be considered as being non-responsive.

Comply

The proposed solution consists of a Primary Core (network control point) and a DSR Core (redundant network control point).

Per Section 3.3.2.5 the locations of these sites are to be mutually agreed between the Vendor and the Customer, but for the purposes of this proposal and the dimensioning of the DC plant associated with each facility, Motorola proposes the use of the State of Florida Tower shelter and the Utilities tower shelter respectively.

3.4.1.11 This redundancy requirement also applies to the simulcast control point.

Comply

The proposed solution consists of a main Virtualized Prime Site (simulcast control point) and a geographically redundant Virtualized Prime Site (redundant simulcast control point).

Per Section 3.3.2.5 the locations of these sites are to be mutually agreed between the Vendor and the Customer, but for the purposes of this proposal and the dimensioning of the DC plant associated with each facility, Motorola proposes the use of the State of Florida Tower shelter and the Utilities tower shelter respectively.

3.4.1.12 The Vendor shall describe its network controller and simulcast control point redundancy configuration scheme and, if virtualized controller/control point configurations are proposed, the number of such configurations allowable within the proposed solution.

Comply

See Section 3.4.6 of this response for details.

3.4.1.13 The Vendor shall describe the method used to automatically transition to such backup configurations and the transitional latency such transitions apply to the radio network, in seconds or milliseconds.

Comply

The failover scenarios with latency times are described in Section 3.4.6 Failover Scenarios.

3.4.1.14 This description shall include the time necessary for the proposed system to sync to the network controller or the simulcast control point, should a system failure require it.

Comply

The failover scenarios with latency times are described in Section 3.4.6 Failover Scenarios.

3.4.2 Typical Infrastructure Site Deployment

3.4.2.1 The Contractor is required to supply a turnkey solution to include: all technical support, equipment, material and labor necessary to develop each proposed infrastructure radio site into a functional P25 digital radio facility, fully incorporated.

Comply

3.4.3

A typical P25 radio infrastructure site equipment shelter shall contain, minimally, the following major equipment groupings:

Comply

3.4.3.1 700/800MHz P25 Phase 1/Phase 2 Base Stations

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Comply

Motorola Solutions exceeds this requirement. Motorola Solutions is proposing P25 Phase 1 and Phase 2 Station with Dynamic Dual Mode on four voice channels. Additionally, each station is equipped to support P25 data operation. Motorola Solutions is proposing an 800 MHz simulcast solution; however, the proposed stations are capable of operating on either the 700 or 800 MHz spectrum.

3.4.3.2 Infrastructure equipment proposed for all radio sites must meet or exceed the Characteristics, and 3.9 Minimum Equipment Requirements.

Comply

3.4.3.3 GPS-Disciplined Frequency Standard (Redundant)

Comply

3.4.3.4 Transmitter Combiner System

Comply

3.4.3.5 Transmitter Antenna Systems

Comply

3.4.3.6 Receiver Multi-Coupler System

Comply

3.4.3.7 Antenna System

Comply

3.4.3.8 Remote Site MPLS Microwave Linkage

Comply

3.4.3.9 Local Area Network Equipment

Comply

3.4.3.10 700/800MHz Mutual Aid Subsystem

Comply

In accordance with guidance previously provided by the City, a mutual aid subsystem has been proposed for the State of Florida tower site only.

3.4.3.11 Mutual Aid Antenna System

Comply

In accordance with guidance previously provided by the City, a mutual aid subsystem has been proposed for the State of Florida tower site only.

3.4.3.12 Conventional Base Station Gateway

Comply

3.4.3.13 Site Alarm Equipment

Comply

3.4.3.14 Battery Plant & Charger Systems

Comply

Motorola Solutions is providing two DC battery plant and charger systems. One 48 VDC battery system is designed for 8-hour backup operation for the 800 MHz simulcast remote site in addition to, where collocated in the same shelter, the Zone Core or Backup Zone Core and the Prime Site or Geo-Redundant Prime Site. The other 48 VDC battery system is designed for 48-hour backup of the microwave backhaul and MPLS equipment at the site.

3.4.3.15 Standby Generator Transfer Switch

Comply

3.4.3.16 Infrastructure equipment proposed for all radio sites must meet or exceed the minimum requirements specified by Sections 3.7 Minimum Operative Characteristics and 3.13 Minimum Equipment Requirements.

Comply

3.4.4 Tower Site Equipment Configuration

3.4.4.1 The P25 simulcast configuration and conventional radio base stations shall operate from a 48 VDC battery-based power source, sized for no less than 8-hours of uninterrupted operation at 100% duty cycle of proposed equipment.

Comply

3.4.4.2 The battery system shall utilize sealed, long-life lead-calcium, or similar modern cells and 100% redundant battery charger components rated for telecommunication service.

Comply

3.4.4.3 An automatic, low voltage disconnect device shall be provided to protect the battery plant from discharge-related damage.

Comply

3.4.4.4 Electrical power switching/disconnect capability shall exist at all sites such that rectifiers, batteries as well as commercial power sources may be separately isolated in a way each component may be serviced safely.

Comply

3.4.4.5 This switching/disconnect capability shall be designed and configured such that radio network operation is otherwise unimpaired and uninterrupted during any repair or maintenance cycle.

Comply

3.4.4.6 Base stations shall be housed in open equipment racks. Racks shall be free standing and incorporate drilled rails to accept standard 19” rack panels. At sites with shared equipment rooms, locking cabinets are required.

Comply

3.4.4.7 A minimum of six (6), but no more than twelve (12) DC-operated base stations should be located within a single equipment rack.

Comply

3.4.4.8 Each equipment rack shall incorporate a circuit-breaker power distribution panel incorporating protection for power amplifier, exciter and receiver groupings.

Comply

3.4.4.9 Individual base station ventilation fan(s), if required, shall be DC powered, thermostatically controlled, internally installed, and shielded.

Comply

3.4.4.10 Each equipment rack shall be protected by a DC-power circuit breaker, sized for nominal load plus 35% overload factor.

Comply

3.4.4.11 The primary battery chargers, low-voltage disconnect equipment, and a primary DC circuit breaker panel shall be installed in a freestanding enclosed cabinet unit.

Comply

3.4.4.12 Likewise, the network's primary/backup controllers and related LAN switch/router devices shall be housed in freestanding equipment racks like those used for repeater stations providing for security of the equipment inside rooms with multiple entities having access.

Comply

3.4.4.13 Auxiliary tower site electrical loads essential to proper system operation (i.e. tower top preamp, redundant GPS reference oscillators and receiver multi-coupler) shall be interconnected directly to the site's battery system.

Comply

3.4.5 Infrastructure Functionality

3.4.5.1 The system shall:

A. Utilize the TIA specified P25 Common Air Interface (CAI) digital control channel scheme, in which user-initiated feature requests and talk-group/working channel assignments are processed digitally over site-specific control channels.

Comply

B. Ensure the remaining channels at sites shall operate as working channels for digital voice traffic.

Comply

C. Utilize an interference-monitored control channel scheme with a level of redundancy that is sufficient to meet the overall requirements and intent of this RFP for a no-break, life-critical, radio communications system.

Comply

D. Ensure the control channel configuration will automatically rotate to other channels, in sequence, should an abnormal number of carrier hits occur on the pre-set control channel.

Comply

3.4.6 Failover Scenario Equipment Descriptions

3.4.6.1 The Vendor shall furnish a description of the effect each of the below listed failure modes would have on their proposed P25 system configuration.

Comply. See responses in Sections 3.4.6.3 – 3.4.6.16.

3.4.6.2 The Vendor shall also describe appropriate mitigation/restoration steps to return the system to full operational capability in response to each of the below listed failure conditions, and the time required to achieve restoration.

Comply. See responses in Sections 3.4.6.3 – 3.4.6.16.

3.4.6.3 Loss of transmitter(s) operation

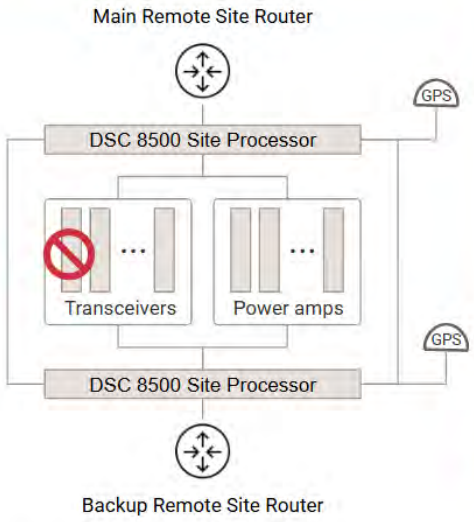
Comply

Simulcast Remote Site Loss of Transmitter Operation

Scenario:	Simulcast Remote Site Loss of Transmitter Operation Loss
Result:	The failure of one voice channel or channels will be transparent to all system users. The Zone Controller removes a base station or stations from service if a failure is reported, resulting in some reduced channel capacity. Any calls in progress on the failed channel will be lost, and on the next push-to-talk, radio traffic will be restored on another channel. All other channels in the RF Site remain unaffected. The entire system remains in the wide area trunking mode. Dispatch console operation remains unaffected.
Protection:	Multiple base stations.
Detection	Alarm on Network Management Terminal (UEM).

Failure of Remote Site Transceiver

ASTRO simulcast subsite



Scenario:	Failure of a single transceiver (XCVR)
Result:	Motorola trunking systems provide up to four possible control channels in a simulcast subsystem. If the currently active control channel is allocated to a XCVR that fails, another channel automatically takes over and the failed control channel is automatically taken out of service (behaviour controlled by the Prime Site). All other channels at the subsite remain unaffected. The site remains in the wide-area trunking mode. The failure is transparent to all system users. Dispatch console operation remains unaffected. In a trunking system, multiple channels inherently provide redundancy for simulcast sites. The failure of a voice channel (not control) will result in the zone controller removing that channel from service, resulting in some reduced channel capacity. Any calls in progress on the failed channel will be lost, and on the next push-to-talk, radio traffic will be restored on another channel. All other channels are unaffected. The failure of one voice channel will be transparent to all system users. The entire system remains in the wide area trunking mode. Dispatch console operation remains unaffected. If provisioned with N+1 transceiver redundancy, the channel capacity will be restored using the redundant transceiver.
Protection:	Multiple potential control channels, redundant transceiver.
Detection:	Alarm on manager terminal

3.4.6.4 Loss of receiver(s) operation

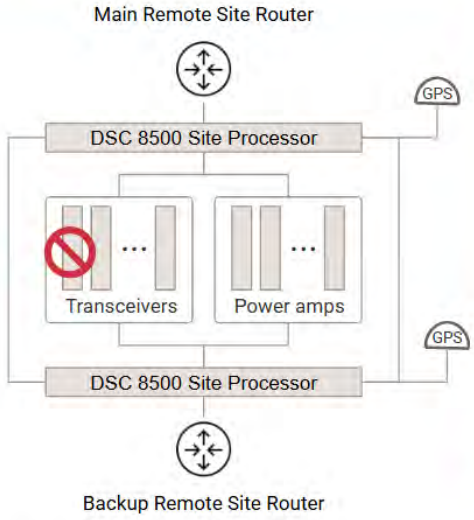
Comply

Simulcast Remote Site Loss of Receiver Operation

Scenario:	Simulcast Remote Site Loss of Receiver Operation
Result:	The failure of one voice channel or channels will be transparent to all system users. The Zone Controller removes a base station or stations from service if a failure is reported, resulting in some reduced channel capacity. Any calls in progress on the failed channel will be lost, and on the next push-to-talk, radio traffic will be restored on another channel. All other channels in the RF Site remain unaffected. The entire system remains in the wide area trunking mode. Dispatch console operation remains unaffected.
Protection:	Multiple base stations.
Detection	Alarm on Network Management Terminal (UEM).

Failure of Remote Site Transceiver

ASTRO simulcast subsite



Scenario:	Failure of a single transceiver (XCVR)
Result:	Motorola trunking systems provide up to four possible control channels in a simulcast subsystem. If the currently active control channel is allocated to a XCVR that fails, another channel automatically takes over and the failed control channel is automatically taken out of service (behaviour controlled by the Prime Site). All other channels at the subsite remain unaffected. The site remains in the wide-area trunking mode. The failure is transparent to all system users. Dispatch console operation remains unaffected. In a trunking system, multiple channels inherently provide redundancy for simulcast sites. The failure of a voice channel (not control) will result in the zone controller removing that channel from service, resulting in some reduced channel capacity. Any calls in progress on the failed channel will be lost, and on the next push-to-talk, radio traffic will be restored on another channel. All other channels are unaffected. The failure of one voice channel will be transparent to all system users. The entire system remains in the wide area trunking mode. Dispatch console operation remains unaffected. If provisioned with N+1 transceiver redundancy, the channel capacity will be restored using the redundant transceiver.
Protection:	Multiple potential control channels, redundant transceiver.
Detection:	Alarm on manager terminal

3.4.6.5 Failure of console/audio interface

Comply

Failure of Console/Audio Controller

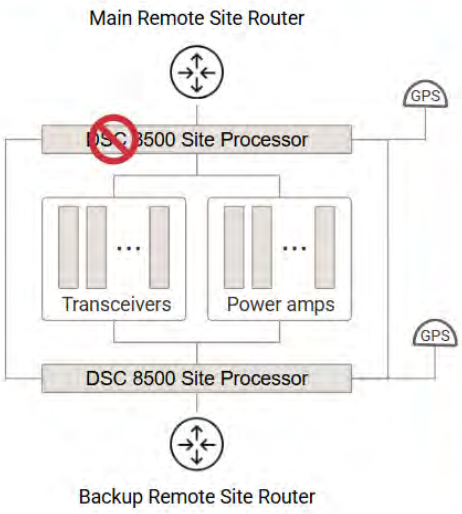
Scenario:	Failure of Console/Audio Controller
Result:	The system employs redundant Site Gateways and redundant Site Links at dispatch sites. Failure of main Site Gateway/Site Link at a dispatch site will result in automatic switchover to the redundant Site Gateway/Site Link. The entire system remains in the wide area trunking mode. The failure is transparent to all system users.
Protection:	Redundant Site Gateway, Redundant Site Links, Dual NIC connection, Backup Dispatch Center
Detection:	Alarm on Network Management Terminal (UEM).

3.4.6.6 Failure of tower site controller

Comply

Failure of Remote Site Processor

ASTRO simulcast subsite



Scenario:	Failure of a subsite DSC 8500 site processor
Result:	Motorola has provided redundant DSC(s) at the subsite. Failure of the a DSC will result in automatic switchover to the remaining DSC(s). The site remains in wide area trunking mode. The failure will result in temporary (approx. 1 Minute) reduction of capacity.
Protection:	Redundant DSC 8500
Detection:	Alarm on manager terminal

3.4.6.7 Commercial power failure

Comply

Commercial Power Failure

Scenario:	Commercial Power Failure
Result:	The redundant power systems that Motorola Solutions has proposed will result in no loss of system functionality in the event that commercial power is lost to the site. The battery banks will continue to provide power to the sites until power is restored to the site or the battery banks are depleted. The battery runtime for the 800 MHz RF site equipment is 8 hours at full load. The battery runtime for the Microwave subsystem equipment is 48 hours at full load.
Protection:	Radio system alarms and site environmental alarms will be summed and viewable from our seamlessly integrated Unified Event Manager (UEM) platform. To allow for capability to configure system parameters, monitor system activity, generate system reports, monitor all critical systems and site status alarms, Network Fault Management (NFM) equipment has been included.
Detection:	Major alarm on Network Management Terminal (UEM).

3.4.6.8 Site generator failure

Comply

Site Generator Failure

Scenario:	Site Generator Failure
Result:	If commercial power is available, there is no impact. If commercial power is not available, power will be provided to the site from the DC plant. The DC battery banks will continue to provide power to the sites until power is restored to the site or the battery banks are depleted. The battery runtime for the 800 MHz RF site equipment is 8 hours at full load. The battery runtime for the Microwave subsystem equipment is 48 hours at full load.
Protection:	Radio system alarms and site environmental alarms will be summed and viewable from our seamlessly integrated Unified Event Manager (UEM) platform. To allow for capability to configure system parameters, monitor system activity, generate system reports, monitor all critical systems and site status alarms, Network Fault Management (NFM) equipment has been included.
Detection:	Major alarm on Network Management Terminal (UEM).

Commercial Power Failure

Scenario:	Commercial Power Failure
Result:	The redundant power systems that Motorola Solutions has proposed will result in no loss of system functionality in the event that commercial power is lost to the site. The battery banks will continue to provide power to the sites until power is restored to the site or the battery banks are depleted. The battery runtime for the 800 MHz RF site equipment is 8 hours at full load. The battery runtime for the Microwave subsystem equipment is 48 hours at full load.
Protection:	Radio system alarms and site environmental alarms will be summed and viewable from our seamlessly integrated Unified Event Manager (UEM) platform. To allow for capability to configure system parameters, monitor system activity, generate system reports, monitor all critical systems and site status alarms, Network Fault Management (NFM) equipment has been included.
Detection:	Major alarm on Network Management Terminal (UEM).

3.4.6.9 Failure of entire tower site

Comply

Failure of Entire Simulcast Subsite Site

Scenario:	Failure of Entire Simulcast Subsite Site
Result:	In the event that both of the Remote RF Site Gateways or Site Links fail, the simulcast sub-site will be removed from the simulcast cell. The remaining simulcast sub-sites will remain unaffected. The coverage from that simulcast sub-site will no longer be available, possibly reducing the coverage footprint. The Network manager will report loss of connectivity alarms for that sub-site. Subscriber units primarily served by the failed sub-site may experience a reduction of coverage depending on their location. If

Scenario:	Failure of Entire Simulcast Subsite Site
	they are out of range of any RF coverage, the subscribers will lose access to the system.
Protection:	Spare Remote Site Gateways an LAN Switches
Detection:	Alarm on Network Management Terminal (UEM).

3.4.6.10 Loss of Control Channel(s)

Comply

Scenario:	Failure of a Single Control Channel
Result:	Motorola trunking systems provide up to four possible control channels in a Remote RF Site. If the currently active control channel fails, another channel automatically takes over and the failed control channel is automatically taken out of service. All other channels at the Remote RF Site remain unaffected. The Remote RF Site remains in the wide-area trunking mode. The failure is transparent to all system users. Dispatch console operation remains unaffected. In a trunking system, multiple channels inherently provide redundancy for Remote RF Sites.
Protection:	Multiple potential control channels
Detection:	Alarm on Network Management Terminal (UEM).

3.4.6.11 Loss of Control Point/Prime Site

Comply

ASTRO 25 Core with Dynamic System Resilience

The proposed radio system includes an ASTRO 25 core that is configured with Dynamic System Resiliency. Dynamic System Resilience (DSR) is an efficient way to achieve geographic redundancy on an ASTRO 25 system. If an event causes a power outage, equipment failure, or physical damage to the primary core, DSR enables automatic switchover to a backup core that will continue to deliver the same high level of availability, reliability, and network management capabilities that users expect from their network.

Primary and Backup Core Systems

When deploying DSR, two cores are deployed: one primary and one backup. These two cores are intended to be geographically separated. Each core has call management applications, system management servers, and networking equipment – everything required to control and manage an ASTRO 25 system.

Automatic Switchover

If the primary core becomes unavailable for any reason, such as power failure, equipment fault, or damage to facilities, the system switches over within seconds to the backup core. Switchover requires

no action from users or network operators. Remote sites that lose communications with their controller will automatically try an alternate path to access the controller. If the original controller is still active and responds, it will continue to use this controller. If the primary controller is not available, the site will use the backup controller. Once the primary core is restored to operation, the remote sites will not switch back automatically unless there is a subsequent failure at the backup. This prevents unnecessary switching should the restoration of service be transient or intermittent. It also allows radio system managers to choose the best time of day to switch back to the primary core, while still maintaining redundant controller capability.

Database Synchronization

Configuration Management is redundant and manual intervention is required for switchover. The Provisioning Manager application configures subscriber access control records. The active Provisioning Manager periodically synchronizes Subscriber Access Control records with the standby Provisioning Manager via a secure data transfer protocol. The network operator chooses which of the two PMs to be active. The Unified Network Configurator (UNC) configures the infrastructure. Since the UNCs and PMs are configured separately, the UNCs need to be configured to synchronize (via a secure data transfer protocol) in the same time period as the PMs. The network operator chooses an active UNC. The active UNC has to be in the same Core Site as the active Provisioning Manager.

IP Services applications, such as DNS and Active Directory, are also redundant. Where appropriate, the applications are synchronized between primary and backup Cores and automatically switch to recover from failures. The Backup and Restore (BAR) service is an exception; each BAR server backs up the zone equipment in its Core. There is no need to share information between BAR servers. BAR clients will interface with the available BAR servers in the zone.

Loss of Control Point (Entire Primary Core Site)

Scenario:	Loss of Control Point (Entire Primary Core Site)
Result:	The loss of the link to the Primary Core site would cause the simulcast cell to automatically switch to the DSR Core site to access the Primary Core. This operation mode allows the dispatch center and simulcast cell to continue operating in wide area. There is no loss of functionality to end radio users.
Protection:	Redundant Cores, Redundant networking equipment to support redundant links
Detection:	Alarm on Network Management Terminal (UEM)

Virtualized Prime Site Availability and Reliability

Prime Site Redundancy

Motorola Solutions has proposed a simulcast P25 solution which consists of a P25 Prime Site coupled with a Geo-Redundant Prime Site as required by the RFP. The Geo-Redundant Prime Site splits redundant receiver voting and simulcast control elements between two geographically separated locations.

Geo-Redundant Prime Site: Controllers and Voting Comparators

The simulcast prime site controller and voting comparator functions have been split between two locations, which allows for the complete loss of a single location with no loss of wide-area simulcast call processing. Benefits of the geographically redundant prime site configuration include:

- Fast switchover.
- The equipment will be physically located at two separate locations.
- Same configuration to ease in maintenance and training.
- The equipment is managed centrally.

In a Geo-Redundant configuration, although the redundant equipment is physically separated between two sites, it appears to the system as a single logical simulcast prime site. The Geo–Redundant configuration provides a fully automatic switchover while simplifying system configuration and troubleshooting. Failure of components or destruction of either Geo-Prime Site causes no loss of wide-area simulcast functionality, capacity, or coverage. In addition, wireline dispatch operation is maintained without impairment.

The Virtualized Prime Site is designed to maintain site functionality in the event of individual failures at the site.

DSC 8000 Failure/Recovery

Scenario:	DSC 8000 Failure/Recovery
Result:	Site functionality is lost due to an individual DSC 8000 failure.
Protection:	The Virtualized Prime Site is installed with pairs of DSC 8000s in order to maintain site functionality in the event of an individual DSC 8000 failure. In the event of a DSC 8000 failure, the remaining DSCs will continue to serve voting/channel operation as well as site control operation. The functions that were active on the failed DSC will transition to the remaining DSCs resulting in a temporary loss of capacity. The active calls that were being serviced on the failed DSC will drop and the standby voting/channel applications will resume within seconds. The Site Controller application will transition to the redundant application immediately. After recovery of a failed DSC (recovery includes a period of time to lock to the site's time reference), software functions will transition to the recovered DSC in order to maintain availability. When the software functions transition a temporary loss of capacity will result. The voting/channel applications transitioning back will experience a brief interruption. If a single voting/channel application has a software failure, the active call will be dropped and the standby application on another DSC will resume within seconds. In the rare event that both Site Controller applications fail, and the DSCs are still operational, the Prime Site will revert to Failsoft mode, if configured.
Detection	The software at the site is distributed to the DSCs with active and standby functions evenly distributed.

Failure of Prime Access Router

Scenario:	Failure of Prime Access Router
Result:	If the Prime Access Router fails, the secondary Prime Access Router located at the secondary simulcast prime site will take over. The switchover is automatic. The failure is transparent to all system users.
Protection:	Redundant Simulcast Prime Access Router.
Detection	Alarm on Network Management Terminal (UEM).

3.4.6.12 Loss of Secondary Control Point/Prime Site (Assume Primary Control Point/Prime Site is unavailable)

Comply

Motorola Solutions' ASTRO 25 trunking networks have three modes of operation for increased reliability. The normal mode of operation is Wide Area Trunking. In the event of multiple component failures that lead to system disruption, the system is equipped to continue operation in two reduced feature operational modes: Site Trunking and Failsoft. Failsoft operation is further subdivided into two possible modes of Failsoft: Site Failsoft (also known a Subsystem-wide Failsoft) or Local Failsoft.

Motorola refers to Control Points as Prime Sites. In the unlikely event of complete loss of the secondary Prime Site (the Geo-Prime Site), when the Primary Prime Site is also unavailable (i.e. both Prime Sites are unavailable concurrently) the RF Sub-sites within the simulcast system would enter Local Failsoft mode of operation.

Failsoft operation provides communications in conventional mode via repeaters/base radios in order to maintain vital communications.

The subscriber's operation in Failsoft mode is determined by the subscriber's programming. A subscriber can be programmed to behave in the following manner:

- Failsoft by control channel operation - The subscriber first scans for alternate control channels outside the multi-site subsystem, then scans the control channel frequencies for Failsoft data.
- Failsoft by working group - The subscriber looks for Failsoft data on a pre-programmed frequency after a scan for alternate control channels outside the multi-site subsystem is unsuccessful. If the subscriber cannot decode Failsoft data on the pre-programmed frequency, the subscriber then scans the control channels in the Simulcast subsystem for Failsoft data.
- In Local Failsoft mode, the channels at the individual RF subsites operate as follows:
- Independent Operation: The individual Base Radios (BRs) configured for Local Failsoft become active and key up their transmit carriers continuously.
- Signaling and Traffic: They transmit a special Local Failsoft Link Control (LC) message along with any received call traffic.
- Loss of Simulcast: Unlike standard Site Failsoft (where simulcasting can continue if the comparators are available), in Local Failsoft, call traffic is no longer simulcasted.

- The system generates a Local Failsoft alert tone with different timing than the standard Site Failsoft alert tone to allow users to distinguish between the two states.

Because each local failsoft channel keys independently on the same frequency at different subsites, this mode should be used with caution, to limit interference within the simulcast subsystem. Concurrent failure of both Primary and Geo-Redundant Prime Sites

Scenario:	Concurrent failure of both Primary and Geo-Redundant Prime Sites
Result:	Channels at each RF Subsite will enter Local Failsoft mode of operation and key up continuously, transmitting a Link Control message
Protection:	Local Failsoft operation.
Detection	Alarm on Network Management Terminal (UEM).

3.4.6.13 Loss of Primary Network Controller

Comply

Loss of Primary Network Controller

Scenario:	Loss of Primary Network Controller
Result:	The failure of the primary network controller (zone controller) will result in the automatic switchover of control to the backup wide area controller site. During a switchover, RF and dispatch sites will automatically switch over to the backup zone controller. As the switchover process takes place, the system will temporarily enter site trunking mode. Wide area trunking will be restored when the switchover process is complete. Any call generated after automatic switchover to the backup wide area controller will not observe any change of service.
Protection:	Redundant Zone Controller at the DSR Backup Core Site, Redundant networking equipment to support redundant links
Detection:	Alarm on Network Management Terminal (UEM).

3.4.6.14 Loss of Redundant Network Controller

Comply

The loss of the redundant network controller, which resides at the DSR Backup Core, will have no adverse effect on operations provided the Primary Zone Core is operational.

Motorola Solutions' ASTRO 25 trunking networks have three modes of operation for increased reliability. The normal mode of operation is Wide Area Trunking. In the event of multiple component failures that lead to system disruption, the system is equipped to continue operation in two reduced feature operational modes: Site Trunking and Failsoft.

In the unlikely situation that the primary Zone Core and DSR Backup Core we to fail consurrently, the simulcast subsystem (meaning the Prime Sites and the RF Subsites) would enter into Site Trunking mode of operation.

Site Trunking is the first failover mode of operation and continues to offer users a high level of functionality for voice communications. Site Trunking implies that the Simulcast Prime Site Controller has lost connectivity with the Zone Core. Talkgroup calls initiated in the RF cell that is in Site Trunking will only be broadcast in that RF cell, but in Fort Lauderdale's case, there would only be single simulcast cell in the proposed system design so all RF Subsites in the system will continue broadcasting calls. Dispatch consoles use control stations (or if desired, the operators use portable radios) to communicate on a Site Trunking RF Cell. Console priority is not available in Site Trunking. Data applications are not available on a site in Site Trunking and will have to be reinitiated once the system reverts to Wide Area Trunking.

Radios detect if a site is in Wide Area Trunking or site trunking. Radio models with a display will indicate to the user when the site is operating in site trunking. The radio alternately displays the selected talkgroup and "Site Trunking". Depending on how the system and user equipment are programmed, subscriber units will try to roam to an RF cell that is in Wide Area Trunking.

Concurrent Loss of both Core Sites

Scenario:	Concurrent Loss of both Core Sites
Result:	In the unlikely event that both Core sites were to fail concurrently, the simulcast subsystem will enter Site Trunking fallback mode of operation.. During Site Trunking operation, system-wide simulcast operation is preserved but wired dispatch consoles will need to use backup control stations to access the simulcast system until normal operation is restored with at least one Core Site returning to operation.
Protection:	Redundant Network Controller sites, plus the ability of the system to operate in Site Trunking if both Network Controller sites are lost.
Detection:	Alarm on Network Management Terminal (UEM).

3.4.6.15 Loss of single/multiple microwave path connectivity

Comply

Loss of Single/Multiple Microwave Path Connectivity

Scenario:	Loss of Single/Multiple Microwave Path Connectivity
Result:	Motorola Solutions' proposed solution includes redundant site gateways and a MPLS router at each site. The loss of a single microwave link will be transparent to all system users as traffic will be automatically redirected using the hot-standby link or by use of the opposite direction around the ring. The impact of the loss of multiple microwave paths is dependent on which combination of paths is lost. If both primary and hot-standby paths in one direction are lost, the MPLS router will redirect traffic using the redundant site link and reverse microwave loop direction. If all links to an RF site are lost, the RF site is removed from the simulcast system, possibly reducing the coverage footprint.

Scenario:	Loss of Single/Multiple Microwave Path Connectivity
Protection:	Redundant site routers, MPLS router, dual microwave loop design
Detection:	Alarm on Network Management Terminal (UEM).

3.4.6.16 Loss of ISSI, Base Station or Broadband Gateway Devices

Comply

Loss of Broadband Gateway Devices

Scenario:	Loss of Broadband Gateway
Result:	WAVE broadband interoperability service involves the use of two gateway devices, namely the WAVE Radio Gateway (WRG) and the Intersystem Gateway (ISGW). Motorola Solutions has provided an ISGW at both the Primary Core site and at the DSR Backup Core site. The loss of the ISGW at the Core site (or its connection to the Zone Controller) will result in takeover of the redundant ISGW at the DSR Backup Core site. Motorola's impact minimization philosophy means that an ISGW failure does not result in a full switchover to DSR operations. Call processing will continue on the primary zone core in this scenario, with the primary core using the interzone link to send ISGW traffic to the backup ISGW at the DSR. However, for WAVE broadband service to be operable at the Backup (DSR) Core site, the Critical Connect Redundancy option must also be deployed, which is priced as an option in our pricing proposal. Thjs option provides WAVE Gateway and LMR Multicast Proxy (LMR) capabilities at the DSR Backup Core, that are otherwise only provided at the primary Zone Core.
Protection:	Geographically-redundant ISGW's, and optional geographically-redundant WAVE Gateway (as provided with the Critical Connect Redundancy option).
Detection:	Alarm on Network Management Terminal (UEM).

Loss of ISSI

Scenario:	Loss of ISSI,
Result:	Motorola Solutions has provided geographically redundant Inter-System Gateways (ISGWs) by providing one ISGW at the primary Zone Core site and a second ISGW at the DSR Backup Core site. The ISGW supports both traditional ISSI connections as well as ISSI connectivity deployed via the Critical Connect service. The primary and redundant gateways can dynamically switch upon failure. Motorola's impact minimization philosophy means that an ISGW failure does not result in a full switchover to DSR operations. Call processing will continue on the primary zone core in this scenario, with the primary core using the interzone link to send ISGW traffic to the backup ISGW at the DSR. ISSI connections also pass through an ISSI Firewall (or the Internetworking Firewall if the ISSI connection is via Critical Connect). While the DSR Backup Core contains its own ISSI Firewall, a failure in the firewall at the primary Zone Core site or the physical transport link connected thereto, is not sufficient in itself to reroute ISSI traffic to the ISGW at the DSR Backup Core. An ISSI firewall failure, or failure of the ISSI transport

Scenario:	Loss of ISSI,
	link itself, would manifest as an ISSI link failure in the foreign system. The foreign system should then notify the home system via SIP Options messaging to switch to a backup IP address that will result in ISSI traffic being rerouted via the DSR Backup Core. This notification mechanism is supported between Motorola systems but may not be available when the foreign system is from another vendor. Failover of an ISSI Firewall or physical ISSI circuit to the DSR Backup facility also relies on the DSR location having its own ISSI transport links in place, which means the foreign system must also support and be set up with dual ISSI links. For ISSI links carried by our Critical Connect service, the Critical Connect Redundancy option must also be deployed in order for ISSI traffic to failover to the DSR Backup Core. This is priced as an option in our pricing proposal, and provides an Internetworking Firewall at the DSR Backup Core, that is otherwise only provided at the primary Zone Core. When a failure is detected in the ISSI link between two systems that cannot be mitigated by the above measures, the foreign subscribers that are currently registered in an ISSI 8000 system can continue to operate within that system, but a new foreign subscriber cannot register in the ISSI 8000 system. An already-registered foreign subscriber can roam between sites and participate in calls within the local system while the inter-system link is down.
Protection:	Geographically-redundant ISGW's and ISSI Firewalls, and optional geographically-redundant Internetworking Firewall (as provided with the Critical Connect Redundancy option).
Detection:	Alarm on Network Management Terminal (UEM).

Loss of Base Station

Refer to "Failure of Remote Site Transceiver" under section 3.4.6.3.

3.4.7 Tower Site Antenna Systems

3.4.7.1 The Contractor shall:

A. Furnish and install antenna systems designed to meet the coverage requirements and objectives described by Section 3.13 Coverage Criteria.

Comply

B. Equip all antenna transmission lines with gas tube lightning arrestor devices (Polyphaser or equivalent).

Comply

C. Ensure all coaxial cable elements used as interconnecting jumpers for outdoor-mounted equipment or indoor transmitter/receiver components are 1/2" Andrew FSJ4-50B or equal.

Comply

D. Furnish and install hot dip galvanized side mount hardware sufficient to extend the transmitter and receiver antennas a minimum of 60-inches from the nearest tower-structure element.

Comply

TX and RX are typically installed with 6 foot standoffs.

E. Ensure transmission lines are grounded at the antenna, at 200-foot tower intervals, at the topmost part of the tower location, at the midpoint (for all towers greater than 200-feet in height), at the location where the transmission lines enter the cable bridge and at the equipment shelter’s transmission line copper entry port.

Comply

F. Utilize only manufacturer-approved grounding strap kits for the type of transmission line installed.

Comply

G. Ensure all connecting hardware will be a hanger block type of a size designed for the cable. No tie wraps or electrical tape will be allowed for attaching cables to towers.

Comply

H. Utilize antenna system mounting brackets, components and associated transmission line attachment hardware that are either stainless steel or hot-dipped galvanized steel.

Comply

3.4.8 Network/Audio Control Scheme

3.4.8.1 The Vendor shall provide detailed descriptions of how the system incorporates high levels of redundancy to ensure continued trunked system operation.

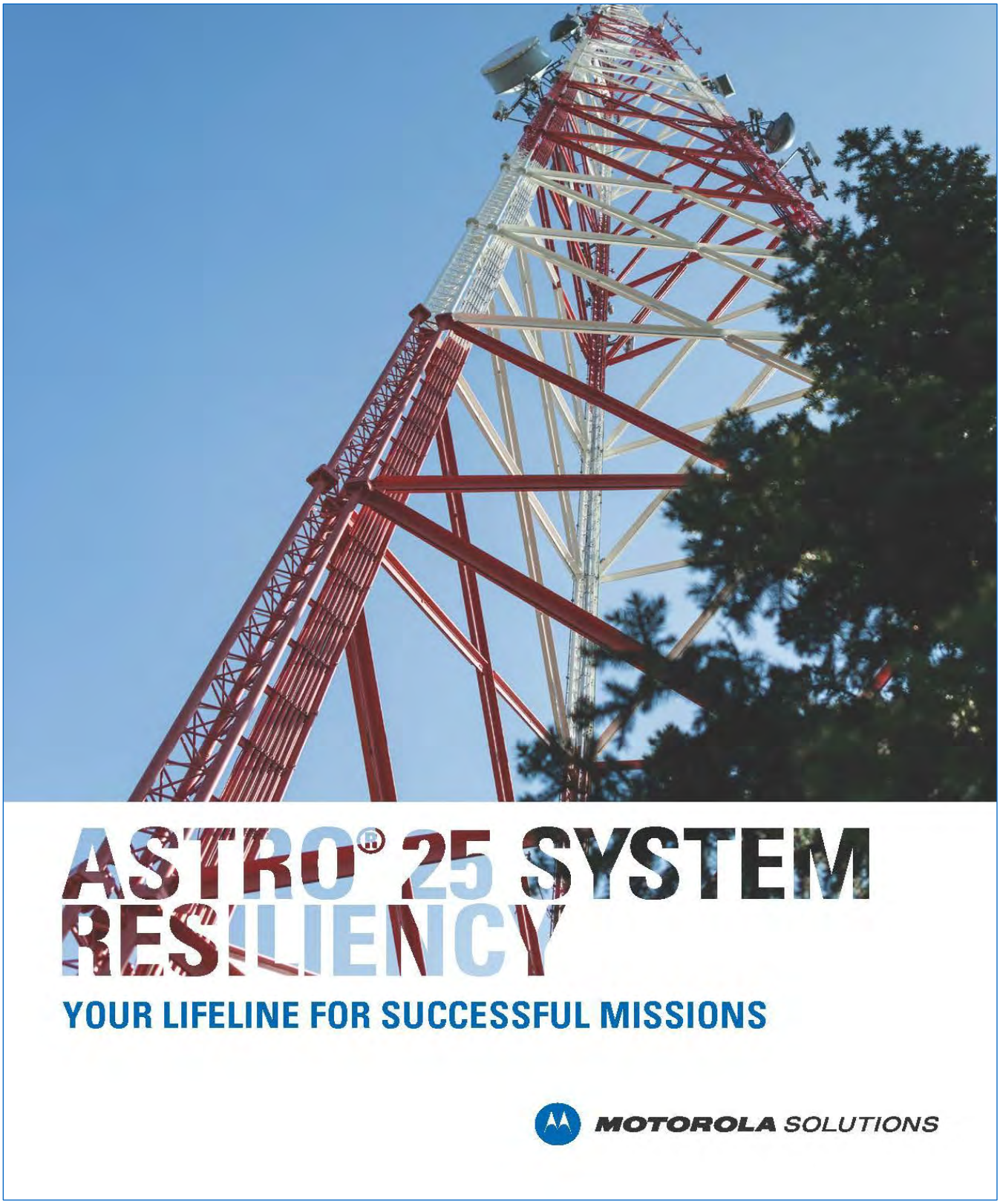
Comply

Please refer to the answers given in section 3.4.6 for detailed descriptions of the proposed system's redundancy and reliability features.

3.4.8.2 To provide the highest level of trunked reliability, site/system control schemes shall be IP-based, fully redundant and utilize distributed processor technology to the maximum extent possible.

Comply

Motorola Solutions has provided our ASTRO System Resiliency Brochure on the following pages.


ASTRO® 25 SYSTEM
RESILIENCY
YOUR LIFELINE FOR SUCCESSFUL MISSIONS
MOTOROLA SOLUTIONS

MAXIMIZE YOUR SYSTEM AVAILABILITY AND RESILIENCY

Land Mobile Radio (LMR) networks are essential to law enforcement agencies, delivering secure and reliable communications to users from emergency response and force protection to command posts and maintenance operations control centers. The design of a highly available LMR network must ensure operational survivability and maximum system resilience across a wide variety of threats. Such threats include natural disasters like typhoons, earthquakes, or wildfires. However, networks may also face other threats such as backhaul or network outages, power failures, cyber attacks, terrorist activity, or full evacuation of a facility or post - all of these scenarios are frequently planned for and drilled on installations worldwide and taken into account when designing LMR networks.

ASTRO®25 systems are designed to provide the maximum level of system resiliency and operational sustainability. Motorola Solutions considers resiliency to be a system wide feature, and the design goal is to enable communications with as many users in the workgroup as possible given the state of the system.

ASTRO®25 system design starts with providing maximum local redundancy at the element level on the local and remote sites. It also includes optional local and geo-redundancy on the regional sites and core master sites. As failures occur, control passes to other components, moving outward from the central core to the edges of the network.

Motorola Solutions has been equipping first responders for more than 85 years with unparalleled communications and innovative technology.

We are dedicated to providing future-ready technologies—streamlining communications and bridging operational gaps. Motorola Solutions enables your operations with best-in-class communications and services, ultimately helping your team be their best in the moments that matter.







MASTER SITE DESIGN

At the heart of the ASTRO®25 LMR design is the core, also called a master site. ASTRO®25 Cores are fully redundant with fault tolerant components with options to enhance. All call processing, system management, routing and switching and other essential elements within a core are fully redundant. This will ensure any single point of failure that impacts critical services is avoided. In almost all cases, switchover from active to standby element is automatic and instantaneous with no impact to users.



3.4.8.3 Primary/Redundant Network and Site control schemes must include protected, redundant power supply units so that the loss of a single power supply will not interrupt control scheme operations.

Comply

3.4.8.4 Radio site controllers shall minimally provide the following features:

Comply

A. Working channel assignment.

Comply

B. Verification of user identification.

Comply

C. Assignment of call priority.

Comply

D. Electronic tracking of call type, caller/called, call time, channel assignment, etc.

Comply

E. Monitor/control of special system features.

Comply

F. Ability to disable/enable call access to specific field units.

Comply

3.4.9 Radio Network Alarm System

3.4.9.1 The Contractor shall furnish and install an automatic alarm system to monitor and alert, at a minimum, operational status (per site) for the following parameters:

Comply

A. The following Major Alarm Conditions (Defined as a condition that could lead to equipment failure in less than 2 hours).

Comply

B. Primary Network Controller Failure

Comply

C. Network Controller Failure

Comply

Motorola will exert continuous effort to resolve critical failures.

D. Simulcast Control Point/Prime Site

Comply

Virtualized Simulcast Prime Site

The Virtualized Prime Site is Motorola Solutions' next generation Simulcast/Voting Prime Site for ASTRO 25 trunking systems. Site Controller and Comparator voting applications are virtualized onto a common hardware platform, consolidating Fault Management and Configuration capabilities into a centralized location and allowing for easier implementation and maintenance. Virtualization also enables software-only expandability. For example, when adding base stations to a simulcast subsystem the Prime Site only needs to add voting software licenses to expand the capacity up to 18 channels. As no additional hardware is required, this expansion can be done remotely.

This fully redundant platform offers a new, web-based configuration tool and access to critical applications for more advanced support without the need for additional hardware. With less equipment to maintain, less power being consumed, and a smaller physical footprint, the Virtualized Simulcast Prime Site lowers the total cost of ownership.

The proposed Virtualized Simulcast Prime Site supports the following features and configurations:

- FDMA/TDMA Voice Calls
- Integrated Data
- Geo-Redundant Prime
- Expandable up to 30 Channels/Carriers
- Up to 32 Remote Sub-sites

As part of the Virtualized Prime Site, the DSC 8000 consolidates the capabilities of a site controller and voting comparator of the ASTRO 25 trunking simulcast sub-system into a single hardware unit. The DSC 8000 assigns voice and data channels, manages and reports alarms, provides Ethernet switching capabilities, and offers an option to use an integrated (i.e. internal) or external timing reference for simulcast synchronization. GPS references are included for the proposed system.

The DSC 8000 also provides an IP-based voting and simulcast operation for trunking channels, picking up audio from multiple sites and performs a frame-by-frame analysis to build a high quality composite audio package for transmission. The DSC 8000 is provided in a redundant configuration, which means no single DSC 8000 failure will cause the loss of any functionality or capacity at the Prime Site.

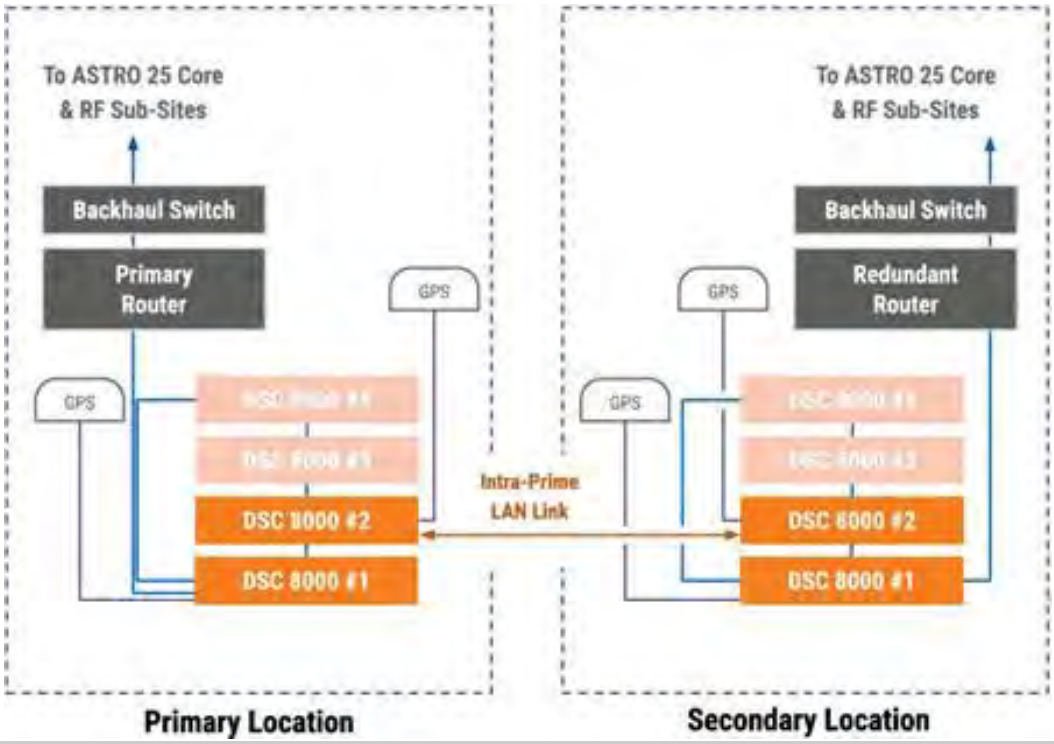
Networking

The Virtualized Prime Site routers are geo-redundant and provide connectivity to both the ASTRO 25 core and RF sub-sites. In addition, geo-redundant backhaul switches connect to Ethernet links (e.g., point-to-point Ethernet links, or to connect to multiple ports on the Ethernet WAN transport backhaul network).

E. Secondary Simulcast Control Point/Prime Site

Comply

We have included a geographically redundant prime site configuration per the RFP. Additionally, the comparators are redundant at each simulcast control point.



F. Site Channel Failure

Comply

G. Channel Failure

Comply

H. Console/Audio Controller Failure

Comply

I. ISSI/Base Station Gateway Failure

Comply

J. Receive Multi-coupler Failure / Tower Top Amplifier

Comply

K. AC Power Failure

Comply

L. High Reflected Power - TX Antenna

Comply

M. Battery Charger Failure

Comply

N. Major Generator Failure/Shutdown

Comply

O. Tower Light Failure

Comply

P. Over/Under Temperature Alarm (HVAC failure)

Comply

Q. Low Transmitter Output (each transmitter)

Comply

R. Microwave Link Failure

Comply

3.4.9.2 The Contractor shall furnish and install an automatic alarm system to monitor and alert, at a minimum, operational status (per site) for the following parameters:

Comply

A. The following Minor Alarm Conditions (Defined as a condition that has little, to no risk of leading to equipment failure prior to arrival of technical staff).

Comply

1. Generator Running

Comply

2. Door Alarm

Comply

3. Tripped DC Breakers(s)

Comply

4. Battery Charger Failure, Minor

Comply

5. Low Fuel

Comply

3.4.9.3 Alarm Monitoring

Comply

A. The use of a software-based alarm network scheme is desired since this would allow for off-site maintenance personnel to interrogate the system in response to agency/user-reported operational deficiencies.

Comply

B. Designated personnel should be able to log in to view alarms remotely.

Comply

C. In addition, the Contractor shall provide:

Comply

1. A summed major/minor alarm indication should be displayed on each alarm system terminal position.

Comply

2. These alarm positions will be located at both network controller locations and the Customer dispatch location.

Comply

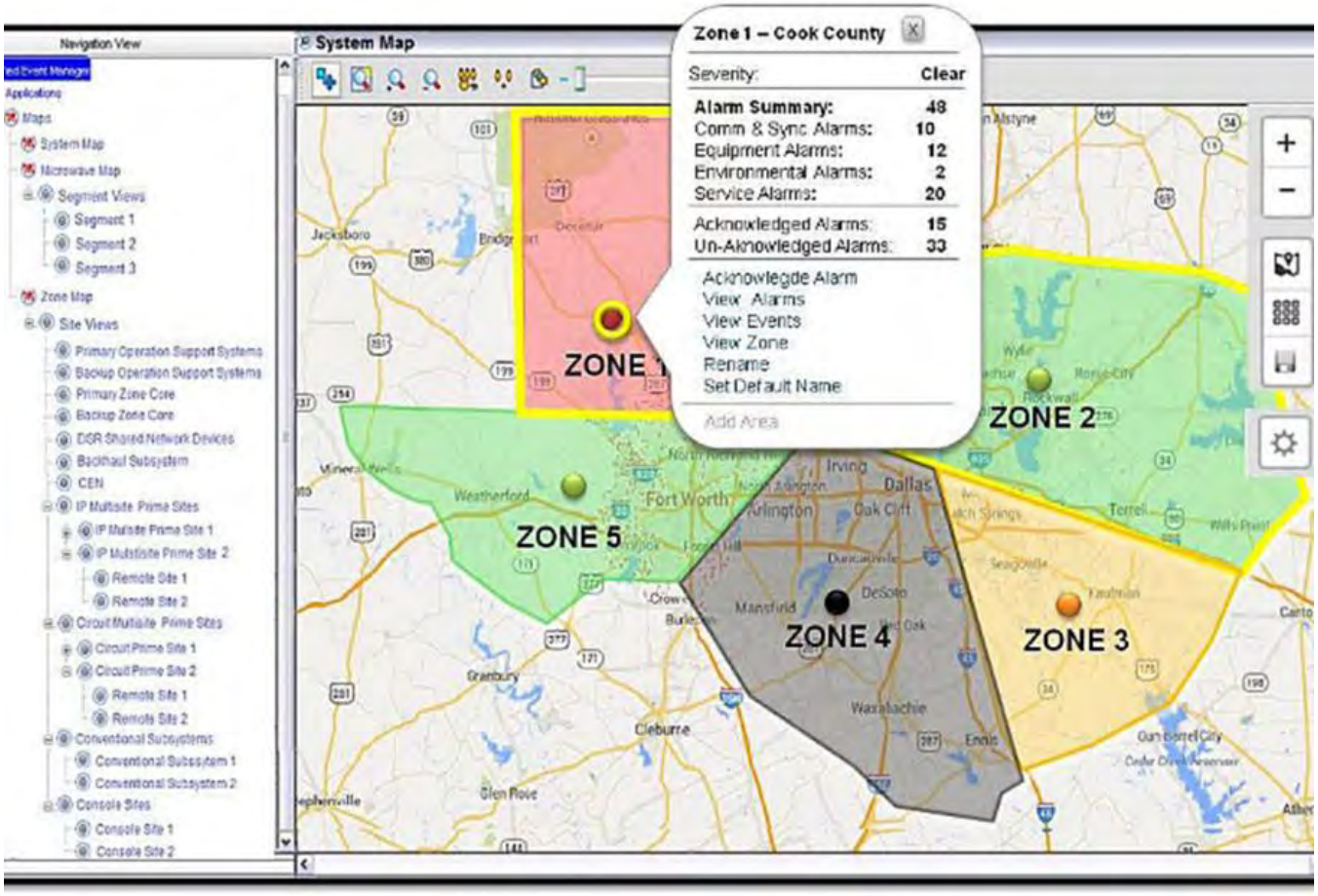
3. This alarm indication should appear as both an audible alert and a flag at a conspicuous area on the flat-screen display field.

Comply

4. Determination of specific alarm point conditions shall be obtainable from any dedicated alarm system terminal position.

Comply

As the primary fault manager tool, the UEM provides system administrators a single interface to view the health of their system infrastructure. Users may drill down from a high-level dashboard to identify the finest component-level alarm, view metering data and access environmental status and controls.



5. These alarms must be capable of email or other common messaging alert to the Customer-designated or proper technical personnel.

Comply

6. This solution shall allow for a view of individual component functionality and status involving, at a minimum, base stations, controllers, gateways, charging systems, GPS timing equipment, and other devices essential to the System's operation.

Comply

D. Vendor shall include, as an optional service, Network Operation Center (NOC) monitoring of the system.

Comply

With Network Event Monitoring, Motorola Solutions uses a Managed Services Suite of Tools (“MSST”) to detect events 24/7 as they occur, analyze them, and escalate them to the Network Operation Center (“NOC”).

The CMSO NOC agent assigns a priority level to an incident and then initiates a response in accordance with the Customer Handling Procedure (“CHP”). Depending on the incident and other services purchased, Motorola Solutions’ response may include continued monitoring for further incident development, remote remediation by technical support, dispatching a field service technician, or other actions Motorola Solutions determines necessary.

Network Monitoring Service

In the public safety world, first responders have little margin for error. That’s why Motorola Solutions developed the Network Monitoring service. With Network Monitoring, you get continuous, real-time monitoring of your network and immediate, proactive response to all network issues, many of which can be resolved remotely without the need to send out a technician. No matter who uses your network, absolute network availability means communications your users can rely on.

Real-Time System Event Monitoring 24x7x365

Motorola’s Network Operations Center (NOC) provides real-time fault monitoring and diagnostics capabilities for your network on a consistent, continuous basis. Motorola Solutions’ NOC utilizes multiple hardware and software tools for remote monitoring, event characterization, and restoration of your communication network. When an event is detected, NOC technologists acknowledge and assess the situation, conduct remote diagnostic routines, and initiate an effective response. Such responses could include, but are not limited to, continuing to monitor the event for further developments; attempting remote restoration; or transferring the event information via a case report to Technical Support to better define the event or dispatch a local service technician. The service technician will respond to the customer site based on pre-determined severity levels and response times and NOC maintains contact with the on-site service technician until the system is restored and the case is closed.

- System availability – Monitoring network events 24x7x365 and taking immediate response helps to maximize the availability of your communications network to your users.
- Quick restoration – Potential network disruptions can be identified and often remotely diagnosed and fixed before there is any impact to your communications system.
- Cost effective – Take advantage of a centralized resource by leveraging the significant investment Motorola Solutions has made in NMO resources, equipment, and processes. No need to duplicate this investment yourself.
- Making it easy – Motorola Solutions’ proven processes, state-of-the-art Network Operations Center, and trained, qualified, and experienced technologists continuously monitor your network so you can focus on your business.

E. The Vendor shall include a description of this service as part of their Response.

Comply

3.4.10 Regional Interoperability

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

3.4.10.1 Customer has a frequent need to communicate with the neighboring agency systems that may utilize their own P25 system or are a part of a regional P25 radio system including the State of Florida's Statewide Law Enforcement Radio System SLERS.

Comply. Per the RFP Motorola has included ISSI for interoperability with other P25 Compliant systems

3.4.10.2 Seamless interoperability between the P25 digital voice radio networks is a requirement. The ability to monitor and/or patch to the VHF or UHF systems is also desired.

Comply

3.4.10.3 The Customer will use subscriber equipment to operate on these neighboring systems directly where possible and though a gateway otherwise.

Comply. See Section 3.4.11.2 for information on neighboring system interoperability.

3.4.10.4 In preparation for such regional interoperability, the Customer requires the capabilities outlined in 3.4.11, 3.4.12 and, 3.4.13.

Comply

Below is a list of ASTRO 25 features showing their level of support between system zones (in a multi-zone system, although the proposed system is single-zone) and across ISSI-linked systems. If a feature is shown as unsupported, this does not indicate a non-compliance with the ISSI standard but typically indicates that the ISSI standard does not provide the mechanisms to support the feature. ("X" denotes "supported").

Table: System to System Connectivity and Features Supported

Feature	Inter-zone or Shared System	Motorola To Motorola ISSI	TIA Based ISSI to Other Vendors
High Level Comparison:			
Full ASTRO 25 feature set	X		
Integrated Data between Zones or Systems	X		
Support for PTT ID and Alias Sharing (Note: These are Motorola Supplementary Services, not core P25 features)	X	X	X
FDMA and TDMA Talkgroups between Zones or Systems	X	X	X
Reduced feature set when Roaming between Zones or Systems		X	X

Feature	Inter-zone or Shared System	Motorola To Motorola ISSI	TIA Based ISSI to Other Vendors
Shared Governance or Separate System Autonomy	Shared	Separate	Separate
Roaming between Zones or Systems: Automatic or Manual	Automatic	Man. Or Auto	Man. Or Auto
Zones or Systems must have Same System Software Version	X		
Dynamic System Resiliency (DSR) Capable 3rd Party ISSI Server protected – link protection is dependent on 3rd party architecture	X	X	X
Alias information	X	X	
Faster/Smooth roaming with Adjacent Channel	X	X	
Fast Start/All Start Config	X	X	
Busy Queuing with Call Back	X	X	
Emergency Recognize across Systems	X	X	
P25 ISSI Voice Features:			
Broadcast Call	X	X	X
Announcement Group Call	X	X	X
Confirmed Group Voice Service (AllStart)	X	X	X
Unconfirmed Group Voice Service (FastStart)	X	X	X
Emergency Group Call	X	X	X
Encrypted Voice	X	X	X
P25 Full-rate vocoder (FDMA)	X	X	X
P25 Half-rate vocoder (TDMA)	X	X	X

Feature	Inter-zone or Shared System	Motorola To Motorola ISSI	TIA Based ISSI to Other Vendors
P25 ISSI Subscriber Unit and Group Management			
Subscriber Unit SC Registration	X	X	X
Transport of Authentication Credential	X	X	X
Secure SU registration (SU Registration)	X	X	X
Subscriber Unit Deregistration	X	X	X
Group Affiliation	X	X	X
Call Restriction	X	X	X
P25 ISSI Roaming (Note: Inter WACN and Inter System IDs are specific to systems that interface via ISSI. Direct integration with a shared system or Interzone will have one WACN and one system ID therefore subscribers can roam automatically without intervention from the user.)			
Inter-WACN (manual)	N/A	X	X
Inter-WACN (automatic)	N/A	X	X
Inter-System (manual)	N/A	X	X
Inter-System (automatic)	N/A	X	X
Intra-System (automatic)	N/A	X	X
RFSS Service Capability Polling	N/A	X	X
Supplementary Services Features:			
Transport of Talking Party Identity	X	X	X
Priority Call	X	X	X
Emergency Alarm	X	X	X
Emergency Alarm Cancellation	X	X	X

Feature	Inter-zone or Shared System	Motorola To Motorola ISSI	TIA Based ISSI to Other Vendors
Group Emergency Cancellation	X	X	X
Selective Call (Private Call)	X		
Selective Alert (Call Alert)	X		
Short Message/Programmed Data Messaging	X		
Radio Check	X		
Radio Monitor	X		
Radio Inhibit/Un-Inhibit	X		
Radio Status Query/Status Update	X		
Location	X		
Over the Air Re-Keying (OTAR)	X		
Over the Air Programming (OTAP)	X		
Text Messaging	X		
Priority Level Access and Queuing	X		
Busy Processing (Busy Queuing & Callback)	X	X	X
Emergency Preemption (Ruthless Preemption)	X		
Dynamic Regrouping	X		
Talkgroup Merge (Group Regroup)	X		
Trunked Scan/Priority Monitor	X		

In addition to supporting standards-based features, Motorola Solutions' P25 ISSI will provide the City of Fort Lauderdale the following operational features supported between Motorola Solutions ASTRO 25 networks:

Alias Display—Allows you to see the Alias from the Home and Visitor Systems.

Unit Alias sharing across ISSI—System B subscribers that have manually roamed to system A can be assigned an alias within system A that can be passed across the ISSI link back to system B. The aliases of the subscribers' home to either system that transmit in either system will be seen at the consoles in either system.

Alias Sharing—Two ASTRO P25 systems can be configured to share their unit aliases. When a subscriber roams to a foreign system, and both the home system and the new system are ASTRO 25 systems, the home system forwards the alias to the new system so that consoles and logging applications can report the correct unit alias when that subscriber transmits.

Fast, Auto Roaming—Allows for fast automatic switchover from the Home to Visitor System coverage footprint.

Busy Queuing and Callback—Home and Visitor talkgroups will receive a busy of the talkgroup is active in either System and receive a callback when the resource is available.

FastStart/AllStart—A foreign talkgroup can be configured as AllStart or FastStart. The AllStart foreign talkgroup will wait for all busy sites to be available before notifying the home that resources are available. The FastStart foreign talkgroup will notify the home that resources are available as long as console sites are available. Foreign talkgroup cannot have designated critical sites. Note that even if the foreign talkgroup is designated AllStart, the home system of the talkgroup may be configured to start the call without the foreign RF resources. In this case, the call will start with whatever resources are available, and the busy sites will join when they are available.

The Critical Connect subsystem includes a server, the Critical Connect application, and firewall. It uses an MPLS or business grade circuit to connect to other ISSI subsystems over a Wide Area Network (WAN). The ISSI link is an Ethernet link that requires a fixed IP address. The different agencies who require interconnectivity can select from a variety of "last mile" and WAN solutions.

3.4.11 ISSI Gateway

3.4.11.1 Vendors shall describe how the proposed System can be interfaced to other regional P25 radio networks now in operation, under development or procurement planning.

Comply. See Section 3.4.11.2 for more information on ISSI gateway technology.

3.4.11.2 Further, the Vendor shall describe each operational feature that is supported by its proposed ISSI technology.

Comply REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Motorola Solutions is proposing P25 ISSI functionality through our Critical Connect subscription-based service offering. The Critical Connect solution is an interoperability solution that will enable the City of Fort Lauderdale's ASTRO 25 system to connect to other P25 systems regardless of their RF bands (VHF, UHF, 700/800 MHz), manufacturer type, release versions and using both P25 Phase 1 FDMA and Phase 2 TDMA technology. Critical Connect is built to the TIA–102 suite of standards used for the design of Project 25 interoperable communication products. When linking two systems of any P25 infrastructure technology, a Critical Connect link enables users on each system to seamlessly and automatically roam between the two systems on designated talkgroups, without having to touch their radios.

P25 subscribers enabled for automatic inter-system system roaming can register on a foreign system that supports registration of foreign subscribers. When the P25 subscriber registers in a system that is not its home, it provides its WACN ID, System ID, and Unit ID. The WACN ID and System ID enable the Inter-System Gateway (ISGW) to determine the IP address of the home system's ISSI interface. Upon a registration from a foreign radio, the ISGW sends the registration request to the home system. If the foreign radio is already registered, it can roam between sites in the same system without involving the home system.

A Motorola subscriber with system roaming capability will indicate on its display that it is roaming outside its home system.

There are three methods of finding a control channel in a different system:

- Foreign Adjacent Status Broadcasts.
- Programming the foreign control channel(s) in the radio.
- Full spectrum scan.

Foreign Adjacent Status Broadcast is the quickest method of finding a new control channel. The full spectrum scan is the slowest method.

The Foreign Adjacent Status Broadcasts can advertise control channels in systems with different frequency band plans from the local system. In this case, the foreign frequency band plan is advertised as well. Unlike same-system Adjacent Status Broadcasts, Foreign Adjacent Status Broadcasts are not based on the health of the adjacent control channels, but only on the pre-configuration of foreign channels in the local system. The health of control channels is not conveyed between systems. Only one control channel per foreign site will be advertised. This should be that site's primary control channel. If the foreign site is using a different control channel, it will not be advertised at the adjacent systems.

When auto-roaming to a different vendor that does not have a preferred control channel (i.e. a control channel that is always used except in the case of channel failure or being forced out of service), or a control channel that can arbitrarily roll over to a different frequency, it is recommended that the list of available control channels be programmed into the home system's subscribers. Motorola's APX subscribers support this capability. This allows for speedy re-acquisition of a control channel in the visited system, without reliance upon a full spectrum scan.

The full spectrum scan can take several minutes, and is not a practical solution for frequent roaming between systems. The full spectrum scan would generally only be used when a subscriber enters the coverage area for a new system that is not adjacent to its previous system and whose control channel frequencies were not configured in the code-plug.

In general, when a subscriber roams to a new system during an active call on a talk-group, the subscriber will be dropped out of the current transmission but will be joined to the call on the next transmission.

When the first radio or console affiliates to a foreign talk-group, the ISGW sends a talk-group registration message across the ISSI link to the talk-group's home system. This enables the talk-group's home system to include the radio or console in the foreign system in future PTTs on the talk-group, and to accept calls across the ISSI link. (If the home system does not allow the talk-group affiliation, the radio is not allowed to affiliate at the site.) Subsequent affiliations to that talk-group from other devices can be processed without being sent to the home system.

A foreign talk-group can be assigned and monitored on a Motorola Solutions console. When the first radio or console affiliates to a foreign talk-group, the ISGW sends a group registration message across the ISSI link to the talk-group's home system. This enables the home system to include the console in future PTTs on the talk-group, and to accept calls from the foreign console across the ISSI link. (If the home system does not allow the talk-group affiliation, the console user will be notified that it was rejected.)

Below is a list of P25 ISSI features showing their level of support between system zones (in a multi-zone system, although the proposed system is single-zone) and across Critical Connect P25 ISSI-linked systems. If a feature is shown as unsupported, this does not indicate a non-compliance with the ISSI standard but typically indicates that the ISSI standard does not provide the mechanisms to support the feature. ("X" denotes "supported").

Table: System-to-System Connectivity and Features Supported

Feature	Inter-zone or Shared System	Motorola To Motorola ISSI	TIA Based ISSI to Other Vendors
High Level Comparison:			
Full ASTRO 25 feature set	X		
Integrated Data between Zones or Systems	X		
Support for PTT ID and Alias Sharing (Note: These are Motorola Supplementary Services, not core P25 features)	X	X	X
FDMA and TDMA Talkgroups between Zones or Systems	X	X	X
Reduced feature set when Roaming between Zones or Systems		X	X
Shared Governance or Separate System Autonomy	Shared	Separate	Separate
Roaming between Zones or Systems: Automatic or Manual	Automatic	Man. Or Auto	Man. Or Auto
Zones or Systems must have Same System Software Version	X		
Dynamic System Resiliency (DSR) Capable 3rd Party ISSI Server protected – link protection is dependent on 3rd party architecture	X	X	X
Alias information	X	X	

Feature	Inter-zone or Shared System	Motorola To Motorola ISSI	TIA Based ISSI to Other Vendors
Faster/Smooth roaming with Adjacent Channel	X	X	
Fast Start/All Start Config	X	X	
Busy Queuing with Call Back	X	X	
Emergency Recognize across Systems	X	X	
P25 ISSI Voice Features:			
Broadcast Call	X	X	X
Announcement Group Call	X	X	X
Confirmed Group Voice Service (AllStart)	X	X	X
Unconfirmed Group Voice Service (FastStart)	X	X	X
Emergency Group Call	X	X	X
Encrypted Voice	X	X	X
P25 Full-rate vocoder (FDMA)	X	X	X
P25 Half-rate vocoder (TDMA)	X	X	X
P25 ISSI Subscriber Unit and Group Management:			
Subscriber Unit SC Registration	X	X	X
Transport of Authentication Credential	X	X	X
Secure SU registration (SU Registration)	X	X	X
Subscriber Unit Deregistration	X	X	X
Group Affiliation	X	X	X
Call Restriction	X	X	X

Feature	Inter-zone or Shared System	Motorola To Motorola ISSI	TIA Based ISSI to Other Vendors
P25 ISSI Roaming			
Inter-WACN (manual)	N/A	X	X
Inter-WACN (automatic)	N/A	X	X
Inter-System (manual)	N/A	X	X
Inter-System (automatic)	N/A	X	X
Intra-System (automatic)	N/A	X	X
RFSS Service Capability Polling	N/A	X	X
Supplementary Services Features:			
Transport of Talking Party Identity	X	X	X
Priority Call	X	X	X
Emergency Alarm	X	X	X
Emergency Alarm Cancellation	X	X	X
Group Emergency Cancellation	X	X	X
Selective Call (Private Call)	X		
Selective Alert (Call Alert)	X		
Short Message/Programmed Data Messaging	X		
Radio Check	X		
Radio Monitor	X		
Radio Inhibit/Un-Inhibit	X		
Radio Status Query/Status Update	X		

Feature	Inter-zone or Shared System	Motorola To Motorola ISSI	TIA Based ISSI to Other Vendors
Location	X		
Over the Air Re-Keying (OTAR)	X		
Over the Air Programming (OTAP)	X		
Text Messaging	X		
Priority Level Access and Queuing	X		
Busy Processing (Busy Queuing & Callback)	X	X	X
Emergency Preemption (Ruthless Preemption)	X		
Dynamic Regrouping	X		
Talkgroup Merge (Group Regroup)	X		
Trunked Scan/Priority Monitor	X		

*Note: Inter WACN and Inter System IDs are specific to systems that interface via ISSI. Direct integration with a shared system or Interzone will have one WACN and one system ID; therefore, subscribers can roam automatically without intervention from the user.

The following operational features are supported between Motorola Solutions ASTRO 25 networks:

- Alias Display—Allows you to see the Alias from the Home and Visitor Systems.
- Unit Alias sharing across ISSI—System B subscribers that have manually roamed to system A can be assigned an alias within system A that can be passed across the ISSI link back to system B. The aliases of the subscribers' home to either system that transmit in either system will be seen at the consoles in either system.
- Alias Sharing—Two ASTRO 25 systems can be configured to share their unit aliases. When a subscriber roams to a foreign system, and both the home system and the new system are ASTRO 25 systems, the home system forwards the alias to the new system so that consoles and logging applications can report the correct unit alias when that subscriber transmits.
- Fast, Auto Roaming—Allows for fast automatic switchover from the Home to Visitor System coverage footprint.
- Busy Queuing and Callback—Home and Visitor talkgroups will receive a busy of the talkgroup is active in either System and receive a callback when the resource is available.

- FastStart/AllStart—A foreign talkgroup can be configured as AllStart or FastStart. The AllStart foreign talkgroup will wait for all busy sites to be available before notifying the home that resources are available. The FastStart foreign talkgroup will notify the home that resources are available as long as console sites are available. Foreign talkgroup cannot have designated critical sites. Note that even if the foreign talkgroup is designated AllStart, the home system of the talkgroup may be configured to start the call without the foreign RF resources. In this case, the call will start with whatever resources are available, and the busy sites will join when they are available.

The Critical Connect service includes a Gateway server at each P25 system core (main and standby), the Critical Connect application, and firewall. Critical Connect uses an MPLS or business grade circuit to connect to other ISSI subsystems over a Wide Area Network (WAN).

3.4.11.3 A minimum of four (4) ISSI connections with twenty talk paths each shall be provided and installed by the Contractor as part of this project's implementation.

Comply

3.4.11.4 Vendors shall propose as an option a redundant gateway configuration that will automatically become operable should the primary gateways sustain an electronic/ functional failure.

Comply

3.4.11.5 The Vendor shall describe its planned ISSI redundancy scheme and functionality.

Comply

Our proposal includes a P25 ISSI gateway and firewall at each of our geo-redundant Zone Core sites.

3.4.12 Base Station Gateway

3.4.12.1 It is important for The Customer to be able to include effective radio interoperability linkages to external radio systems operated by federal, state, and other non-public safety agencies in the future.

Understood

3.4.12.2 The Vendor shall provide:

A. Base Station Gateway devices shall be located at the radio tower sites and allow the interconnection of legacy analog, and other digital radio systems onto the new radio network.

Comply

B. The location of the gateways should be part of the vendor's design and located to best serve the interoperability requirements of Customer.

Comply

C. The Base Station Gateway shall additionally facilitate appropriate Radio-to-IP interfaces and Four-Wire 'Ear and Mouth' (4W E/M) interfaces that are compatible with new radio system's infrastructure and dispatch center configuration.)

Comply

The MCG 8000 CCGW supports Radio-to-IP Interfaces and Four-Wire 'Ear and Mouth' interfaces.

D. The furnished Gateway shall provide the below-listed functionality:

Comply

1. Base Station Gateway shall allow System users to initiate and drop appropriate control link/base stations via talk-group selection on appropriately-programmed System user radios.

Comply

2. Any control station or radio device that is interfaced to the Base Station Gateway shall be steerable to a minimum of sixteen (16) channels or talkgroups.

Comply

3. Users shall be able to monitor traffic on the external radio systems, via the Base Station Gateway device.

Comply

4. The Customer radio telecommunicators shall have the ability to patch the System’s Base Station Gateway channel traffic onto other P25 network talkgroups on an ad-hoc, as-needed basis.

Comply

3.4.13 Broadband Gateway Solution

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

3.4.13.1 The ubiquitous use of commercial broadband Smartphone devices presents new opportunities for providing P25 radio access to those entities having the need for communications with The Customer’s user agencies.

Understood

3.4.13.2 Vendor shall provide:

A. Furnish and install a Broadband Gateway solution designed to support connectivity with outside cellular device users.

Comply

B. The Broadband Gateway Solution shall be located in conjunction with both the primary and redundant Network Controllers.

Comply

Our optional pricing presented with this proposal includes a redundancy option for the on-premises portion of the Broadband Gateway solution, whereby this functionality will be available at the backup zone core ("DSR") site in the case of failure of the primary system.

C. Each Gateway shall, as an option, be configured as an “automatic-protected” from whereas if the primary Broadband Gateway at a Network Controller site should fail, the equipment would “self-heal” and automatically transition to the backup, redundant Gateway device.

Comply

D. The Vendor shall identify the required smartphone and licensing for Broadband users. The Vendor shall provide the capability and quantity of users that are included with the design.

Comply

See Section 1.1.17 of Attachment 17 – 3.4.13.2.F Functional Description of Proposed Broadband Gateway Platform or Solution (Solution Description).

1. The quantities for additional user licensing and increments shall also be estimated at quantity of 3000.

Comply

E. The Broadband Gateway Solution shall support normal P25 voice radio user functionality, inclusive of AES 256-bit encryption.

Comply

F. The Vendor shall provide a functional description of its proposed Broadband Gateway platform or solution, including automatic failure-recovery modes and alarm notification processes.

Comply

Please refer to the system description in **Attachment 17 – 3.4.13.2.F Functional Description of Proposed Broadband Gateway Platform or Solution (Solution Description)** for a detailed overview of the proposed Broadband Gateway Solution. At the cloud, we have in-data-center redundancy by default, in addition to geo-redundancy if a data center is lost. Our optional pricing presented with this proposal includes a redundancy option for the on-premises portion of the Broadband Gateway solution, whereby this functionality will be available at the backup zone core ("DSR") site in the case of failure of the primary system. The Broadband Gateway platform reports alarms through the Motorola Unified Event Manager (UEM).

*Attach functional description of proposed Broadband Gateway platform or solution

Comply. See **Attachment 17 – 3.4.13.2.F Functional Description of Proposed Broadband Gateway Platform or Solution (Solution Description).**

G. This Broadband Gateway Solution shall be required to interface with FirstNet as well as other commercial cellular carriers utilized by the Customer.

Comply

3.4.14 System Voice Encryption

3.4.14.1 The following components, at a minimum, require system voice encryption:

Comply

A. Each of the network's P25 trunked digital RF channels shall be equipped to support voice encryption using the Advanced Multiband Excitation +2 (AMBE+2) or newer vocoder.

Comply

B. Encrypted mobile and portable units shall be of the same physical size and general configuration as non-encrypted units.

Comply

C. Encrypted units shall be certified for FIPS 140-3 along with any associated equipment to support the functionality.

Comply

The APX family of radios exceeds this requirement by utilizing the Motorola Advanced Cryptographic Engine (MACE) chip. The MACE is an on-board radio encryption device providing cryptographic services for all voice and data communications. It also provides a secure environment for storing encryption keys via a hardened tamper-resistant chassis. The MACE has the capability to not only store the City of Fort Lauderdale's encryption keys but will also protect those keys from being accessed by unauthorized users through physical or electronic means. Any physical disruption of the MACE chip automatically triggers the radio to erase all key material.

This capability allows the APX family of radios to meet Federal Information Processing Standard Publication (FIPS) encryption standards FIPS 140-3 Level 1 and Level 3 and FIPS 197. APX series P25 two-way radios are the only radios in the industry that meet the FIPS 140-3 Level 1 and Level 3 validation.

D. Accessory equipment shall be compatible with both types of units.

Comply

E. Proposed Phase 1, or Phase 2, radio coverage throughout the area defined in Section 3.13 Coverage Criteria, in the digital encrypted mode, shall be equal to that in the digital clear mode.

Comply

F. The System shall be configured and include both Over-the-Air-Programming (OTAP) and Over-the-Air-Rekeying (OTAR) of user radio equipment as an option. Both of these configurations must include the server to accommodate this functionality.

Comply

3.4.15 NPSPAC 800MHz Mutual Aid Sub-System

3.4.15.1 If NPSPAC channels are utilized in the proposed system, the Vendor shall describe in detail the configuration of its NPSPAC 800MHz Mutual Aid subsystem that is optimized to provide mobile radio coverage and conforms to the following requirements:

Understood

3.4.15.2 The mutual aid subsystem will be comprised of five duplex channels that conform to the National Plan, as follows:

Comply

A. 8CALL90 - 851/806.0125MHz

Comply

B. 8TAC91 - 851/806.5125MHz

Comply

C. 8TAC92 - 852/807.0125MHz

Comply

D. 8TAC93 - 852/807.5125MHz

Comply

E. 8TAC94 - 853/808.0125MHz

Comply

F. All channels use CTCSS 156.7Hz

Comply

3.4.15.3 Contractor shall interconnect these various mutual aid base stations into the P25 trunked radio network via site-located conventional base station gateway devices. Radio tele- communicators shall be capable of monitoring each of these various mutual aid channels.

Comply

3.4.15.4 The Vendor shall provide a description of its proposed mutual aid subsystem configuration, inclusive of coverage maps depicting VHF, UHF and 700/800 MHz mobile coverage as applicable.

Comply

Please refer to the Coverage Map Section in **Attachment 18 – 3.4.15.5 Configuration Diagrams and Coverage Maps.**

3.4.15.5 Further refinement of the mutual aid subsystem is anticipated and may be undertaken by the Customer as part of the project's design review meeting process.

Understood

*Attach any Configuration Diagrams and Coverage Maps

Comply

Please refer to the Coverage Map Section in **Attachment 18 – 3.4.15.5 Configuration Diagrams and Coverage Maps.**

3.5 Physical Security

3.5.1 The Vendor shall propose a comprehensive set of physical and cybersecurity safeguards to protect the integrity of the new system.

Exceeds

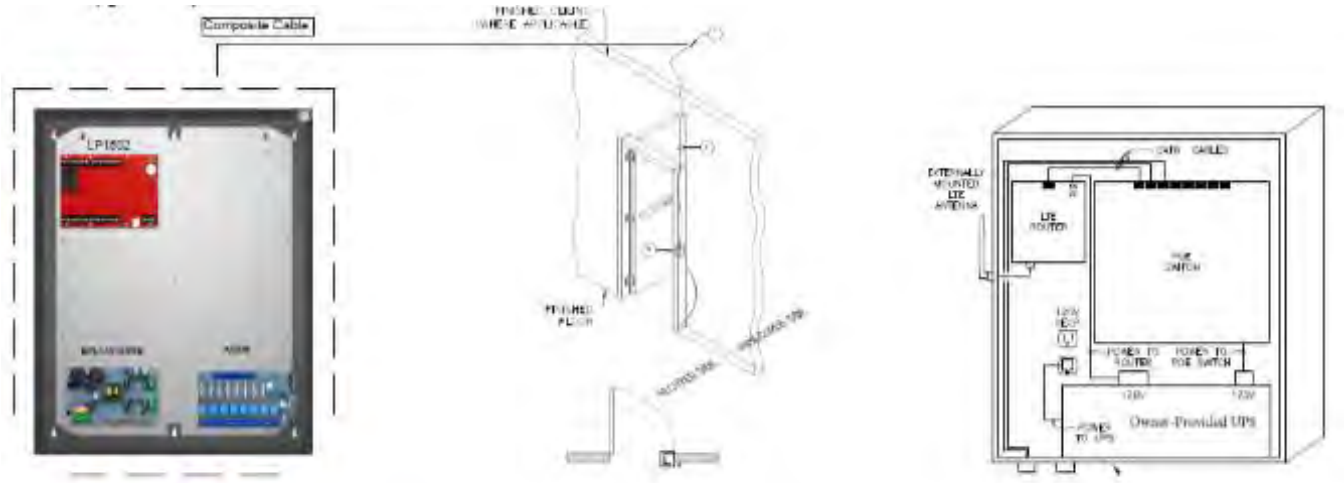
All new shelters provided by Motorola shall include Avigilon video surveillance and Genetic compatible door strikes with card readers installed included with 3 years subscription included for all licenses.

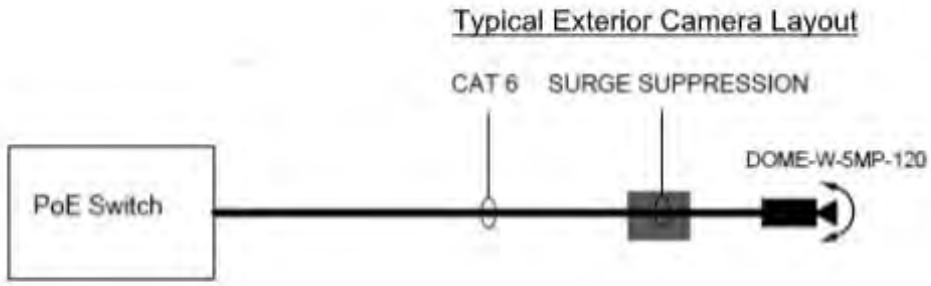
Fort Lauderdale owned shelters are not included.

Motorola's proposed solution include per each new shelter :

- Per shelter:
  - (2) Dome interior / exterior Avigilon Alta Cloud Camera with 90 days of on camera Storage for 3 Year duration
  - Honeywell Pro-Watch controllers per each required door of the proposed shelters
  - PepLink 5G router for internet connectivity or connect to site backhaul

The proposed Honeywell credentials can be utilized as standalone solution





3.5.2 The physical portion of the furnished communications network shall include:

Understood

3.5.2.1 Video surveillance of fixed remote infrastructure sites.

Comply

3.5.2.2 Storage of the video surveillance footage shall be stored internally to the cameras for a minimum of 90 days.

Comply

3.5.2.3 A mechanical keylock set and a keycard system shall be supplied for each of the remote tower site facilities.

Comply

3.5.3 The Customer currently uses a Honeywell ProWatch for keycard access.

Understood

3.5.4 The Vendor should provide a standalone Honeywell ProWatch keycard system for access to the proposed shelters. As an option, the Vendor is requested to use the existing Honeywell ProWatch system and provide proper connectivity and the interface. Vendor to determine versions and compatibility with the City's existing infrastructure.

Comply

3.6 Cybersecurity

3.6.1 The system may contain various entry points that include ISSI/CSSI and Broadband gateway connections to external radio communications facilities operated by others and the accessibility of the radio system to technical and engineering resources via the Internet. Each of these points must be appropriately secured using firewalls, data encryption, and other means to prevent intentional hacking of critical information or installing viruses and malware that could inhibit or disrupt mission-critical communications.

Comply

3.6.2 The Vendor shall provide, within its Technical Response, a detailed description of the various cybersecurity measures it would employ to protect the proposed new System, both initially and throughout the warranty and post-warranty maintenance periods.

Comply

3.6.3 The system and all of its associated equipment, connected either directly or indirectly, shall be SOC 2 Compliant where applicable. The Vendor shall supply certifications validating this compliance within their response.

Comply

3.6.3.1 Where respondents propose systems that are not reliant on offsite infrastructure (cloud hosting), SOC-2 is not necessary.

Understood

3.7 Minimum System Operative Characteristics

3.7.1 General

3.7.1.1 In this Section, channel usage characteristics for agencies now operable on the Customer's legacy radio system are presented. From this information, the Vendor can better determine the channel capacity (and subsequently the channel plan) needed to satisfy talk-group structure requirements for this project.

Understood

3.7.2 Minimum System Performance

3.7.2.1 The Vendor should assume that the current talk-group assignment/usage will be replaced with a P25 digital radio overlay having a similar trunked radio talk-group structure.

Comply

A. Appendix B contains a detail of the current talk-group structure now being utilized.

Understood

3.7.2.2 The Vendor can use this information and other statistics or information to structure capacity studies and related technical considerations necessary to develop a radio frequency channel/capacity plan for the system.

Understood

3.7.2.3 The minimally-acceptable Quality of Service Objective for the system shall be a call blocking rate of no more than 1%, with the delay for such calls that are queued to be no greater than 0.5 seconds.

Exceeds

Motorola Solutions predicts a worst case call blocking rate of only 0.01% under the traffic simulations that were run for this system. This was even after using a baseline of 28% higher busy hour traffic than the worst busy hour provided in the City's traffic data, and the 25% required growth. Further details of our traffic modeling can be found in our Solution Description in Section 1.1.9.

3.7.2.4 The Vendor shall describe in the response:

Understood

A. Typical call setup times for trunked radio calls, which in no case shall exceed 0.5-seconds.

Comply

The proposed P25 trunked radio system will conform to TIA/EIA approved standards with respect to channel access and audio delay. PTT access time provided shall be no greater than 500 milliseconds (ms).

B. Typical audio processing delays, due to vocoding and digital signal processing, within the Vendor's specific radio technology solution. These delays shall be described for Emergency Calls, Group Calls, Patched Calls, ISSI Calls, Base Station Gateway Calls and Broadband Gateway Calls.

Comply

The proposed P25 trunked radio system will conform to published TIA/EIA approved standards regarding audio processing delays through the proposed system.

TIA/P25 audio processing delays are defined in the context of a trunking system, trunking or conventional base station, and end user subscriber units and therefore, are not specific to any call type. Motorola's proposed system configuration complies with all the TIA/P25 requirements and does not introduce any call processing delays as verified through the DHS P25 CAP verification process.

C. The various levels of call transaction priority as assigned to: Emergency Calls; Group Calls; Fleet Calls; Patched Calls; ISSI Calls; Base Station Gateway Call transactions and Broadband Gateway Calls.

Comply

The proposed system provides 10 Priority Levels, allowing system administrators to segment radio users according to their communications needs. Priority 1 is always reserved for emergencies. Priorities 2 through 10 can be assigned on a per radio or talkgroup basis. These priorities are only applicable when the system is busy.

D. How these various call transaction delays can potentially impact site capacity loading, and how does the Vendor mitigate this in the design process.

Comply

The effects of the various call transaction delays are mitigated during the design process by incorporating theoretical maximum delays into the Grade of Service (GoS) calculations. Per our GoS studies, the Fort Lauderdale P25 system is designed for better than 1% GoS.

3.8 System Fleet/Talkgroup Requirements

3.8.1 Contractor shall assist the Customer and various user agencies in determining user identification and talk path assignments.

Comply

3.8.2 Contractor shall program all portable, mobile and control station radios, all System or site controllers and all other equipment to operate on the FCC-licensed operating frequencies and determined talk path profiles.

Comply

Motorola Solutions has included all programming cost for proposed P25 radio mobiles, portable and control stations as well as programming of all system controllers, control points, base stations and networking equipment provided in our proposal to Fort Lauderdale.

3.8.2.1 This includes existing equipment that is capable, and may operate on the System, at the time of cutover, supplied by other P25 subscriber manufacturers.

Comply

3.8.3 Contractor shall prepare and furnish to the Customer "as programmed" records for each control station radio and pager placed on the System.

Comply

3.8.4 Contractor shall provide training for System/Network Managers sufficient to permit the Customer's prime agencies to add users, create new, or delete obsolete talk paths and to access all other System software-controlled features.

Comply

3.8.5 Provisions shall be incorporated into the system to allow the Contractor, from its home office, to remotely interrogate the operating system, provide remote technical assistance and install software patches if requested by The Customer.

Comply

3.8.6 Contractor must provide eight (8) sets of radio and equipment programming software, appropriately equipped laptop/desktop computers, and all other support equipment and special cables necessary to program all control stations and dispatch consoles supplied by the Contractor.

Comply

3.9 Minimum Infrastructure Equipment Requirements

3.9.1 General

3.9.1 This Section describes minimally-acceptable requirements for fixed-site radio equipment.

Understood

3.9.2 All radio equipment installed or provided by the Contractor shall be FCC type accepted under Part 90 of the FCC Rules and Regulations. All supplied equipment shall be in current production and shall meet or exceed the requirements of this Section.

Comply

3.9.3 Base station/repeaters shall support P25 Phase 1 and Phase 2 modulation formats and shall support P25 trunked data technology.

Comply

3.10 Base/Repeater Stations

3.10.1 All Base/Repeater P25 radios proposed shall:

3.10.1.1 Meet APCO minimum recommendations and EIA/TIA standards for P25 Public Safety digital trunked/conventional radio systems (depending upon application within sites).

Comply

3.10.1.2 Furnished equipment must be capable of operation as a combined Phase 1 and Phase 2 infrastructure.

Exceeds

Motorola Solutions exceeds this requirement. Motorola Solutions is proposing 700/800 MHz P25 Phase 1 FDMA for all channels and Phase 2 TDMA with Dynamic Dual Mode (DDM) on four channels. Equipping the system with DDM allows Fort Lauderdale the ability to maintain seamless interoperability with other P25 FDMA subscribers.

The included four TDMA licenses allow the system to carry up to 13 voice paths, which are sufficient to meet the capacity and traffic requirements for the system. Our price proposal also shows optional, incremental pricing to add additional TDMA licenses to more of the voice channels, should the City wish to do so. (Note: In any TDMA expansion being contemplated, it is unnecessary to add TDMA licenses to the control channel.)

3.10.1.3 Be designed for 100% continuous-duty operation at full manufacturer specification.

Comply

Motorola Solutions DBR M12 P25 Repeater is the successor to the GTR 8000 Expandable Site Subsystem. The DBR M12 is rated for 40 W, measured from the top of the rack, as was its predecessor, the GTR 8000 ESS. This 40W power output in the GTR 8000 ESS is the top of rack power that could be guaranteed when starting with 100W from the power amplifier and the cavity combiner and Tx Post filter loss tolerances are accounted for.

3.10.1.4 In P25 multi-site and simulcast configurations, base stations shall utilize linear RF power amplifiers and function in a linear simulcast mode that minimizes to the greatest extent possible destructive time-delay interference within site coverage-overlap regions and minimizes digital modulation distortion, termed modulation fidelity.

Comply

3.10.1.5 Modulation fidelity, for this RFP, is a measurement of the degree of closeness that the transmitted modulation matches the ideal theoretical modulation for P25 Phase 2 waveforms.

Comply

3.10.1.6 Incorporate site monitor and infrastructure alarm systems having the ability to report major/minor infrastructure functionality alarms on multiple dispatch-located alarm console display devices. Additionally, the alarm reporting system shall have the capability of being remotely accessed for the monitoring and remote-interrogation of field/site related alarms, using a laptop configuration from any node within the network.

Comply

3.10.1.7 Utilize the proposed 48 VDC battery backup subsystem.

Comply

3.10.1.8 Include a "Fail-over/Fail-Soft" trunking scheme designed to maintain network performance as critical site components fail. System must be fault tolerant with redundant levels of computer hardware/software, as necessary, to maintain trunked operation during equipment failures.

Comply

The proposed system is inherently redundant and can sustain multiple system–level failures while still delivering high levels of operational functionality.

Motorola Solutions' ASTRO 25 trunking networks have three modes of operation for increased reliability. The normal mode of operation is Wide Area Trunking. In the event of multiple component failures that lead to system disruption, the system is equipped to continue operation in two reduced feature operational modes: Site Trunking and Failsoft.

Wide Area Trunking Wide Area Trunking is the ASTRO 25 system's normal mode of operation. Wide Area Trunking implies that the Fixed Network Equipment is operating properly. All Simulcast cells and ASTRO 25 Repeater Sites are communicating with the Zone Core. Subscriber units automatically roam between the various network RF cells. Talkgroup calls occur in the appropriate RF cells if users are distributed throughout multiple cells. Data applications are properly assigned channels for communication between the subscriber units and the host application.

Site Trunking Site Trunking is the first failover mode of operation. Site Trunking impacts individual RF cells within a network. In multiple RF cell systems, one RF cell can be in Site Trunking, while the rest of the system remains in Wide Area Trunking. Site Trunking implies that the Simulcast Prime Site Controller or the ASTRO 25 Repeater Site has lost connectivity with the Zone Core. Talkgroup calls initiated in the RF cell that is in Site Trunking will only be broadcast in that RF cell. Dispatch consoles use control stations (or if desired, the operators use portable radios) to communicate on a Site Trunking RF Cell. Console priority is not available in Site Trunking. Data applications are not available on a site in Site Trunking and will have to be reinitiated once the system reverts to Wide Area Trunking.

Radios detect if a site is in Wide Area Trunking or site trunking. Radio models with a display will indicate to the user when the site is operating in site trunking. The radio alternately displays the selected talkgroup and "Site Trunking". Depending on how the system and user equipment are programmed, subscriber units will try to roam to an RF cell that is in Wide Area Trunking.

Failsoft by Talkgroup Subsystem/Site Failsoft is the final fallback means of communication if a site no longer maintains Wide Area or Site Trunking operation. Multiple failures have to occur for the system to enter Failsoft. The subsystem goes into Failsoft mode in any of these scenarios:

- The site controllers are not functioning properly.
- When all control channels are disabled or malfunctioned; or
- When only one channel is enabled.

Failsoft operation provides communications in conventional mode via repeaters/base radios in order to maintain vital communications. In an IP multi-site Simulcast subsystem in subsystem–wide Failsoft, received audio is routed to the comparator for voting and redistributed to all of the sites for simulcast transmission.

The subscriber's operation in Failsoft mode is determined by the subscriber's programming. A subscriber can be programmed to behave in the following manner:

- Failsoft by control channel operation - The subscriber first scans for alternate control channels outside the multi-site subsystem, then scans the control channel frequencies for Failsoft data.
- Failsoft by working group - The subscriber looks for Failsoft data on a pre-programmed frequency after a scan for alternate control channels outside the multi-site subsystem is unsuccessful. If the subscriber cannot decode Failsoft data on the pre-programmed frequency, the subscriber then scans the control channels in the Simulcast subsystem for Failsoft data.

Dispatch consoles use control stations to communicate on a Site Trunking RF cell. The City of Fort Lauderdale's dispatch sites will a back up radio for each dispatch position so dispatchers can access these control stations from their consoles. Console priority is not available in Site Trunking. Data applications are not available on a site in Failsoft and will have to be re-initiated once the system reverts back to Wide Area Trunking.

3.10.1.9 Support special services, i.e. encrypted voice, data transmission, multiple Computer Aided Dispatch (CAD) system interfaces, Automatic Vehicle Location (AVL) interfaces, audio recording of talk groups, and collection of system operational data.

Comply

Refer to **Attachment 17 – 3.4.13.2.F Functional Description of Proposed Broadband Gateway Platform or Solution (Solution Description).**

3.10.1.10 700/800MHz P25 Repeater station specifications are as follows:

*Attach supporting documentation for this section.

Comply

See **Attachment 19 – 3.10.1.10 Repeater Station Supporting Documentation.**

3.10.1.11 General Specifications:

Comply

A. Frequency Range: 764-776MHz, 851 to 870MHz

Comply

The frequencies from 764 to 768 MHz are reserved for broadband use and have been specifically established for FirstNet use under the current FCC band plan.

The offered repeater stations support the frequency bands 768-776 MHz or 851-870 MHz. These frequencies cover the entirety of the band plans authorized by the FCC for public safety narrowband use.

B. Number of Frequencies: One transmit; one receive

Comply

C. Channel Spacing: 25/12.5KHz

Comply

D. Channel Capacity: 10, minimally

Exceeds

The DBR M12 can support up to 12 channels per rack, and up to 28 channels in a simulcast cell.

E. Input Voltage: 48 VDC operation

Comply

F. Temperature Range: '-30°C to +60°C

Comply

G. Humidity: 90 % relative humidity at 50°C (typical)

Comply

3.10.1.12 Transmitter specifications are as follows:

Understood

A. Output Impedance: 50 Ohms

Comply

B. Power Output: 100 watts

Comply with Clarification

Motorola Solutions DBR M12 P25 Repeater is the successor to the GTR 8000 Expandable Site Subsystem. The DBR M12 is rated for 40 W, measured from the top of the rack, equivalent to the GTR 8000 ESS. This 40W power output in the GTR 8000 ESS is the top of rack power that could be guaranteed when starting with 100W from the power amplifier and the cavity combiner and Tx Post filter loss tolerances are accounted for.

C. Stability: 0.01 PPM from -30 °C to +60 °C ambient, when referenced to site-based GPS-disciplined frequency standard.

Comply

Repeater site: 100 ppb/2yrs or GPS synchronized
Simulcast (multi-site): GPS synchronized

D. Emission: 8K30F1W; 8K70D1W; 9K80F1D; 11K2F3E; 9K80F1D, 9K80D7W or comparable Phase 2 Emission

Comply

E. Modulation Deviation: +/-2.5KHz (12.5KHz), +/- 4KHz (NPSPAC)

Comply

F. Channel Spacing: 25KHz; 12.5 KHz

Comply

G. Audio Distortion: 2% at 1KHz

Comply

H. Audio Response: Within +1, -3db of 6dB/octave per EIA

Comply

I. Spurious/Harmonic: -65dB

Exceeds

Spurious and Image Rejection - 100dB.

3.10.1.13 Receiver specifications are as follows:

Understood

A. Frequency Range: 792-825MHz

Comply

The frequencies from 792 to 798 MHz are reserved for broadband use and have been specifically established for FirstNet use under the current FCC band plan.

The offered repeater stations support the receive frequencies 796-825 MHz. These frequencies cover the entirety of the 700 MHz and 800 MHz base station receive band plans authorized by the FCC for public safety narrowband use.

B. Modulation Acceptance: 1KHz off channel

Comply

C. Selectivity: -70dB

Comply

D. Sensitivity: 0.25uv

Exceeds

0.25uv is equivalent to -119dBm sensitivity. The DBR specs exceed this, H-CPM: -121.5 dBm.

E. Intermodulation: -80dB

Comply

F. Spurious/Image: -85dB

Exceeds

Spurious and Image Rejection -100dB.

G. Frequency Stability: 0.01-PPM (GPS standard)

Comply

H. Channel Spacing: 12.5KHz

Comply

I. Audio Distortion: 2% at rated audio line level (600-Ohm)

Comply

J. Audio Response: Within +1/-3dB of 6dB/octave per EIA

Comply

K. Duty Cycle (EIA): Receiver 100%

Comply

3.10.1.14 General Specifications Minimum 800MHz Analog Base/Repeater station specifications:

Understood

A. Frequency Range: 806 to 869MHz

Comply

B. Number of Frequencies: One transmit; one receive

Comply

C. Channel Spacing: 25/12.5KHz

Comply

D. Channel Capacity: 10, minimally

Comply

E. Input Voltage: 48 VDC operation

Comply

F. Operating Temperature: -30°C to +60°C

Comply

G. Humidity: 90 % relative humidity at 50°C (typical)

Comply

3.10.1.15 Transmitter specifications are as follows:

Understood

A. RF Output Impedance: 50 Ohms

Comply

B. Power Output: 100 watts

Comply

Motorola Solutions DBR M12 P25 Repeater is the successor to the GTR 8000 Expandable Site Subsystem. The DBR M12 is rated for 40 W, measured from the top of the rack, as the GTR 8000 ESS was. This 40W power output in the GTR 8000 ESS is the top of rack power that could be guaranteed when starting with 100W from the power amplifier and the cavity combiner and Tx Post filter loss tolerances are accounted for.

C. Frequency Stability: 0.01 PPM from -30 °C to +60 °C ambient, when referenced to site-based GPS-disciplined frequency standard.

Comply

D. Modulation Deviation: 0 to +/- 5KHz (25KHz), 0 to +/- 4KHz (NPSPAC)

Comply

E. Modulation Type: Analog FM 16K0F3E

Comply

F. Channel Spacing: 25KHz; 12.5 KHz

Comply

G. Audio Distortion: 2% at 1KHz

Comply

H. Audio Response: Within +1, -3db of 6dB/octave per EIA

Comply

I. Spurious/Harmonic: -65dB

Exceeds

3.10.1.16 Receiver specifications are as follows:

Comply

A. Frequency Range: 806-825MHz

Comply

B. Modulation Acceptance: 1KHz off channel

Comply

C. Selectivity: -70dB (-80db for 25KHz channel)

Comply

D. Sensitivity: 0.25uv 5.2.10.3.5. Intermodulation: -80dB

Comply

E. Spurious/Image: -85dB

Exceeds

Spurious & Image Rejection 100 dB

F. Frequency Stability: 0.01-PPM 5.2.10.3.8. Channel Spacing: 12.5KHz

Comply

G. Audio Distortion: 2% at rated audio line level (600-Ohm)

Comply

H. Audio Response: Within +1/-3dB of 6dB/octave per EIA

Comply

I. Duty Cycle (EIA): Receiver 100%

Comply

3.11 Fixed Microwave Equipment Requirements

3.11.1 The microwave network shall adhere to The Customer's network management plan as defined in Appendix G: Network Management Requirements.

Comply

3.11.2 Digital voice/data technology shall be used to minimize audio-phase delays and/or incompatibility of audio levels within the proposed network solution.

Comply

3.11.3 Where VoIP techniques are used to interconnect infrastructure sites, in lieu of traditional PCM multiplex channel schemes, a robust means shall be provided thereby assuring that the highest priority possible is given to voice packet delivery.

Comply

3.11.4 Redundant transmit, receive, and baseband equipment for each site, configured for automatic hot standby operation, shall be provided by the Vendor. This redundant equipment will automatically switch to the hot standby component(s) upon failure of the primary equipment.

Comply

Motorola Solutions and its microwave backhaul partner, Infinity Technology Solutions, provided a Loop design solution with directional switching, which provides multiple layers of path redundancy and availability. Per the City's specification, we have provided a monitored, hot-standby (MHSB) terminal configuration for each radio.

For automatic hot standby operation, redundant equipment will automatically switch to the hot standby component(s) upon failure of the primary equipment.

3.11.5 A Microwave Alarm System shall be provided by the Vendor to monitor microwave site functions and to provide alarm status of abnormal operational parameters of equipment associated with the microwave system. Microwave major alarms shall be integrated within the radio alarm packaged supplied by the Vendor.

Comply REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Infinity Technology Solutions' microwave alarms will integrate into Motorola Solutions' Unified Event Manager.

3.11.6 An orderwire channel with 4 wire E&M output and individual site handsets will be provided to link all microwave locations for testing and troubleshooting.

Comply

3.11.7 A separate 48 VDC microwave standby battery system will be provided and sized for 48-hours of continuous microwave equipment operation at each infrastructure site.

Comply

3.11.7.1 An automatic low-voltage disconnect system will be employed to protect the battery plant from deep-cycle discharge damage.

Comply

3.11.8 Microwave system availability shall be no less than 99.999%. 6GHz path segments longer than 12-miles must utilize space-diversity. The system shall be loop-configured with hitless directional switching.

Exceeds

Motorola Solutions offers an annual 2-way path availability of 99.9998% on one path and 99.9999% on all other paths. Further details can be found in our Solution Description in Section 1.1.8.

3.11.9 Microwave antennas, radomes, and antenna mounts supplied and installed will be capable of surviving wind speeds of up to 150mph and maintaining reliable operations during sustained storm force winds of up to 125mph.

Comply

3.11.10 Each furnished antenna system will be equipped with dual stiff arms/ruggedized mounts to limit antenna vibration and flexing during high wind events.

Comply

*Attach supporting documentation for this section.

Comply

See **Attachment 20 – 3.11.10 Dual Stiff Arms and Ruggedized Mounts**. This document includes general product information and information relating to dual stiff arms and ruggedized mounts.

3.11.11 Minimum operational service parameters of each microwave link are as follows:

3.11.11.1 Unfaded Bit Error Rate (BER): Not Less Than 10-10

Comply

3.11.11.2 Calculated RF Link Fade Margin: Not Less Than 40dB

Comply

3.11.11.3 Link Outage Level: To coincide with 10-3 BER, to occur at a signal level not less than 3db in excess of the calculated RF link fade margin.

Comply

3.11.12 Microwave system shall incorporate a quadrature amplitude modulated adaptive protocol that automatically adjusts protocol to maintain critical communications during abnormally faded conditions.

Comply

3.11.12.1 This technique is intended to extend the microwave system's functionality to beyond that of the normal 40db flat fade margin.

Comply

3.11.13 Vendors may use high-power amplifiers (i.e., 36dBm to 39dBm), as may be necessary, to achieve the best balance between antenna size versus the 40db flat fade margin requirement.

Comply

3.11.14 In no case should antennas larger than 8ft. in diameter be considered for this project unless high-performance antennas are required due to interference mitigation requirements as noted by the Frequency Coordinator.

Exceeds

Motorola Solutions exceeds this requirement. Our microwave backhaul system includes no antenna larger than 6-feet in diameter.

3.11.15 The Contractor shall be responsible for the engineering and filing costs for microwave system frequency coordination, prior coordination notification, FCC license application preparation and submittal of necessary microwave licensing documents on behalf of the Customer.

Comply

3.12 Additional Submittal Requirements:

3.12.1 The Vendor is not required to present a detailed fixed path design of the proposed microwave subsystem for the purpose of the Technical response, as such work is dependent upon exact antenna placements that will be resolved by the Vendor during the various design review meetings to be held prior to system construction.

Understood

3.12.2 The Vendor shall provide the following information as part of the Technical proposal:

Understood

3.12.2.1 Technical specification literature for its proposed microwave radio, antenna and related equipment.

Comply

Motorola Solutions has provided specifications sheets for the proposed microwave radio, antenna and related equipment in **Attachment 21 – 3.12.2.1 Technical Specifications Literature for Microwave Radio, Antenna and Related Equipment.**

*Attach supporting documentation for this section.

Comply. See **Attachment 21 – 3.12.2.1 Technical Specifications Literature for Microwave Radio, Antenna and Related Equipment.**

3.12.2.2 A sample path profile analysis indicative of the scope to be used during the actual microwave analysis process.

Comply

3.12.2.3 The sample analysis shall include all of the tower sites that encompass the Vendor's proposed radio infrastructure configuration.

Comply

*Attach supporting documentation for this section.

Comply. See **Attachment 22 – 3.12.2.3 – Path Profile Analysis.**

3.12.2.4 A sample test and alignment verification process, to be used during the commissioning of the new microwave subsystem.

Comply

*Attach supporting documentation for this section.

Comply

See **Attachment 23 – 3.12.2.4 Sample Test and Alignment Verification Process.**

3.12.2.5 The Vendor may reuse/reconfigure the Customer’s existing microwave equipment as this equipment if it is supported and is expected to have operational value within the new P25 System.

Understood

3.12.2.6 The Vendor will provide the bandwidth provided by the proposed microwave system.

Comply

A. This information should include the amount of bandwidth for all portions of the radio system and any other equipment/systems integrated in the proposed network.

Comply

B. It should also include any additional bandwidth that could be used by the Customer and the interface at each site for the additional bandwidth.

Comply

*Attach supporting documentation for this section.

Comply

See **Attachment 24 – 3.12.2.5.B Bandwidth Supporting Documentation.**

3.13 Coverage Criteria

3.13.1 General

3.13.1.1 The System's P25 digital trunked radio network shall be designed to support portable hand-carried radio subscriber equipment on the hip with a speaker microphone, operated on-street, at physical locations throughout the identified service area.

Comply

3.13.1.2 The Vendor must fully determine and guarantee the coverage predicted for the proposed solution, as per the functional and operational requirements of this RFP.

Comply

3.13.1.3 The Vendor shall provide within the response a sample Coverage Test and Acceptance Plan that encompasses the elements described as follows.

Understood

3.13.2 Coverage parameters

3.13.2.1 The Vendor must consider the following operating parameters in the development of their coverage guarantee:

Comply

A. Shoulder/microphone units without antennas will be used with portable radio units in most instances and shall be the normal configuration considered for coverage design.

Comply

B. Body and obstruction losses must therefore be considered in the proposed network design for both talk-in/talk-out coverage analyses.

Comply

C. Flexible, quarter wavelength antennas shall be required for portable units. Coaxial-skirt type or ½ wave antennas are not acceptable due to size and other mechanical/ergonomic limitations.

Comply

1. User operations and portable subscriber configurations do not relieve the vendor of system design and testing requirements to a ¼ wave portable antenna.

Comply

D. Mobile unit configurations shall utilize low profile 3db gain 700/800MHz antennas. These antennas shall be located on the vehicle's trunk, having an average base level height of 3.5 feet.

Comply

E. All Loss factors for portable loss factors and testing will be clearly identified in contractor's response.

Comply

The portable loss factor used in the coverage design, and to be used for coverage testing, is 8.9 dBd. This is the loss factor for the APX N50 model of portable, equipped with a 10 cm stubby (1/4-wave) antenna in a swivel case worn on a belt at waist level, with remote speaker microphone. The portable loss factor accounts for both the antenna gain relative to a half-wave dipole, and the typical body loss of the wearer. **Motorola Solutions asserts that this paragraph contains Trade Secret information as defined in Florida Statute 688.002 that is exempt from public records disclosure per Florida Statute 119.0715.**

1. Failure to provide these loss factors will result in a lower score or consideration of the proposal being non-responsive.

Understood. See previous response.

3.13.3. Noise Floor & Interference

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

3.13.3.1 It is the intent and requirement that the system shall be designed such that the indicated coverage goals and requirements herein be met irrespective of external noise and interference.

Comply

A. It is essential that the Contractor undertake whatever measurements, surveys, and studies as necessary such that the state of the noise and interference environment is quantified prior to the system's final design.

Comply

B. The final system design shall make such allowances as necessary, including but not limited to reduced repeater site effective sensitivity (predictions) in the presence of noise and interference (as measured) to achieve the Customer's required degree of coverage.

Comply

In an effort to proactively identify potential interference, Motorola Solutions made good faith effort pre-proposal to identify if any noise interference is present that could impact the proposed solution. The results of our limited duration evaluation do not identify frequency noise risk issues for the spectrum proposed. Motorola Solutions cannot account for or if any frequency noise issues were not present during our evaluation.

Motorola Solutions recorded noise measurements at the proposed sites as part of our proposal effort within Fort Lauderdale to sample noise within our proposed 800 MHz receive frequencies. The results of the monitoring are both documented and captured in the Spectrum Analysis report provided below. This action in conjunction with the vetted frequency plan are proactive steps to developing a final system design that will deliver maximum coverage and audio quality. These measurements and findings will act as the baseline for interference and noise floor for the entire system.

Motorola Solutions shall execute an evaluation for the presence of impactful noise and interference at each of the sites during project implementation.

3.13.3.2 The Contractor shall not excuse a failure of any portion of the coverage test due to external noise or interference, with one exception:

Understood

A. If the Contractor can show, with certified measurement data, that the noise and/or interference environment has substantially changed between the initial pre-design measurements/surveys and the time of the performance of the coverage acceptance test.

Comply

B. If such findings can be demonstrated, then the coverage requirement for the affected portion of the coverage test may be conditionally accepted by the Customer as an exception.

Comply with Clarification

Motorola Solutions reserves the right to review any test tiles that fail. If a coverage test, or a portion thereof, is suspected by Motorola Solutions to have failed due to external interference, those tiles suspected of being affected by an interferer may be re-tested. If the test tiles re-tested are confirmed to have failed due to interference or external noise, those test tiles will be excluded from all acceptance calculations and Motorola Solutions will work with Fort Lauderdale to identify potential solutions to the interference issues.

3.13.3.3 As part of its proposal development, the Contractor shall undertake a best-faith effort to investigate the existence of abnormal noise/interference levels, if any, and shall incorporate those findings within its coverage map submittals for the proposed system.

Comply

As part of the preparatory work for this proposal, a Motorola Solutions technician visited each proposed RF site to capture 20 minutes of spectrum analyzer measurements at ground level.

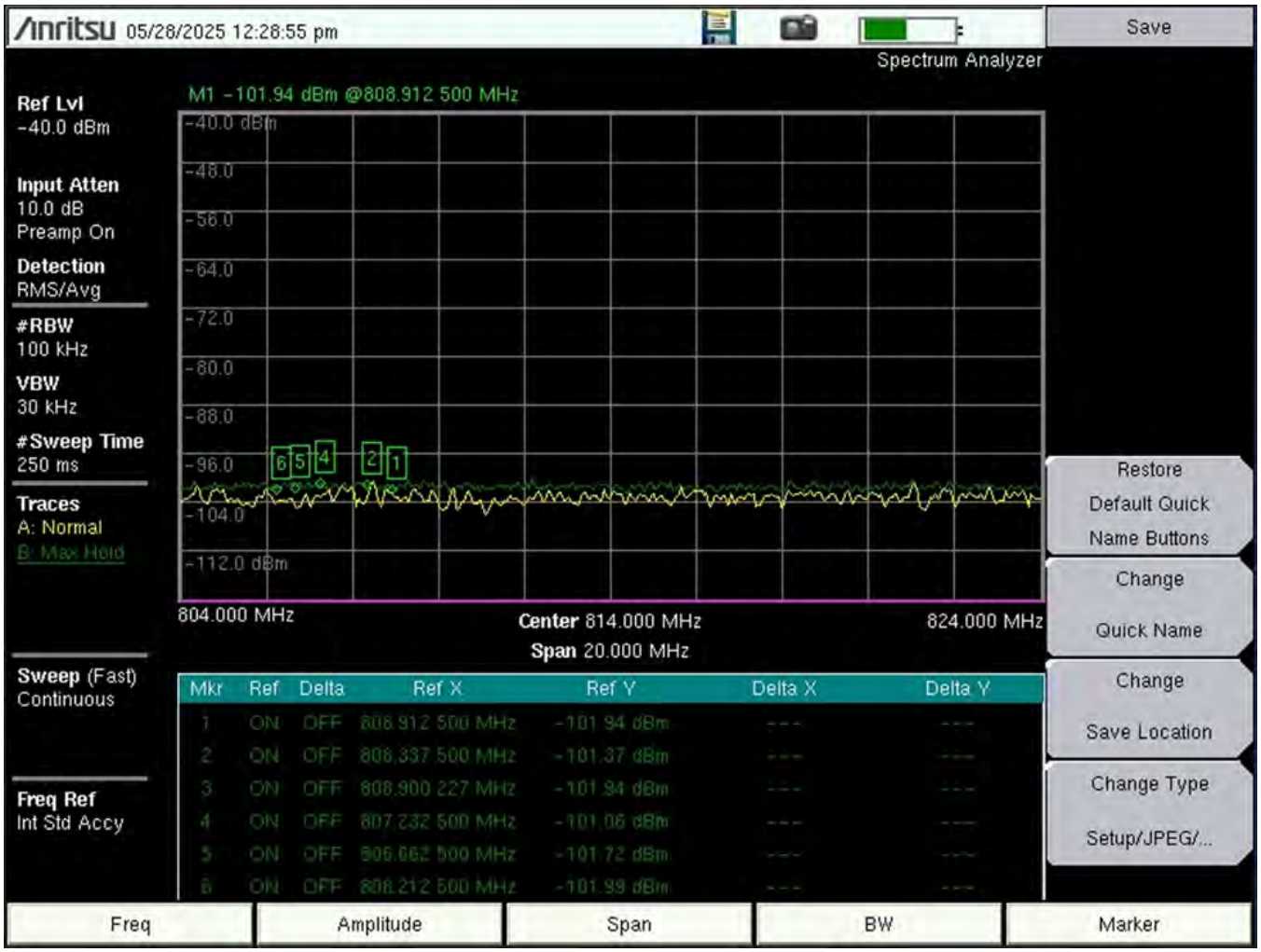
In each location, the antenna-derived measurements were paired and compared with baseline measurements using a dummy 50 ohm load on the analyzer’s input. The maximum signal strength detected over the 20 minutes is displayed in the green “Max Hold” trace on the spectrum analyzer screen shots provided below. Measurements were taken with a ¼-wave mobile antenna at the two tower sites, and a 5 dBd mobile antenna at the two condominium sites, and were taken with the analyzer’s preamp turned on. The analyzer readings automatically compensate for the internal preamp and attenuator gains and losses, but not for the gain of the external antenna.

While this was a best-faith effort in accordance with RFP paragraph 3.13.3.3, it should be noted that measurements conducted at ground level can be of limited value, as interference will often only be detected at higher elevations (above surrounding building and tree heights) unless the interferer is very

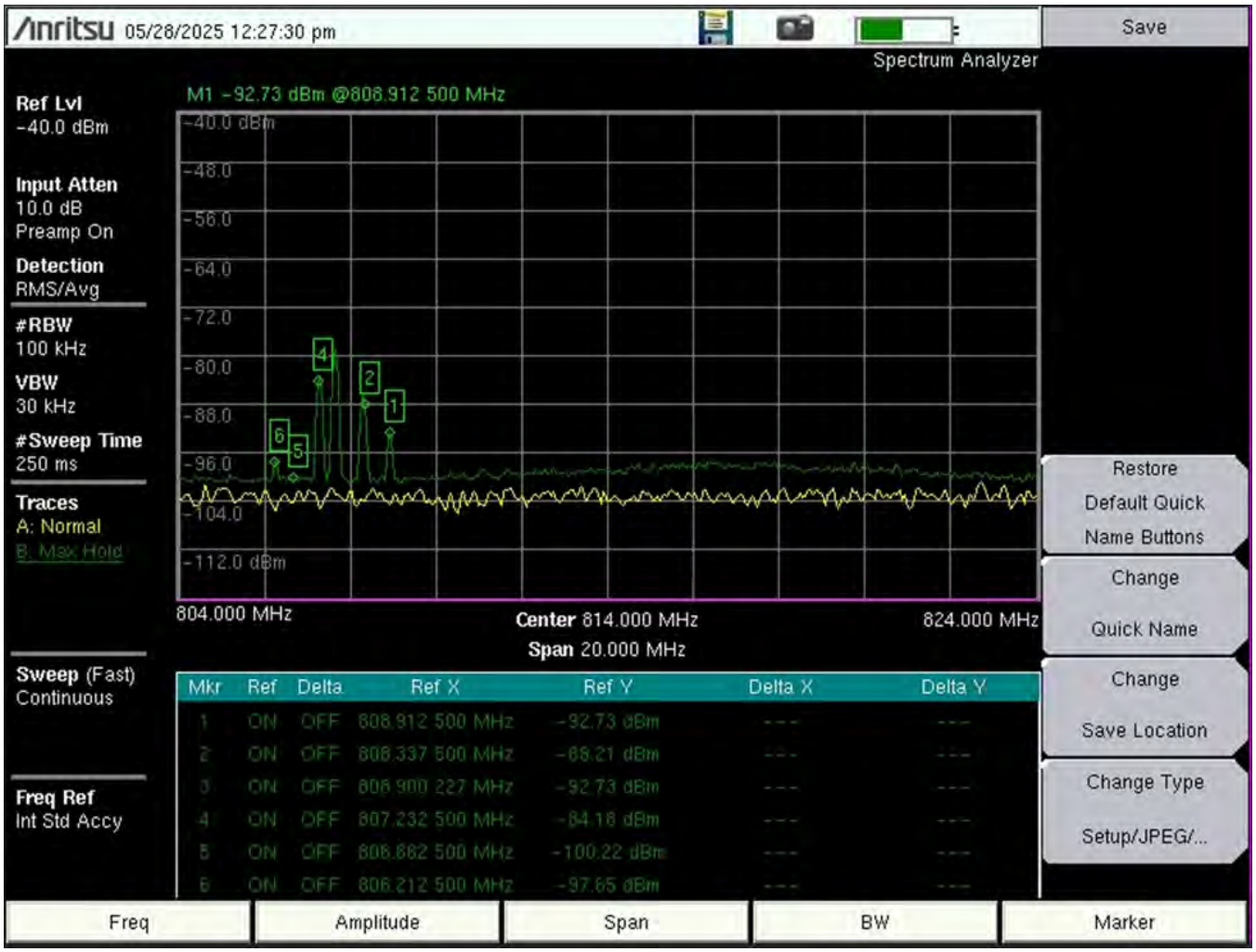
near. In contrast, a scientifically conducted spectrum fingerprinting study commissioned from a firm specializing in these studies, will typically span at least 24 hours and will employ elevated antennas or actual site antennas where they exist and where possible to tap into these. A spectrum fingerprinting study is much more likely to be successful in detecting unwanted interference, if any exists. Noise measurement results are included in the following pages.

Future State of Florida Tower location

Connected to 50 ohm load

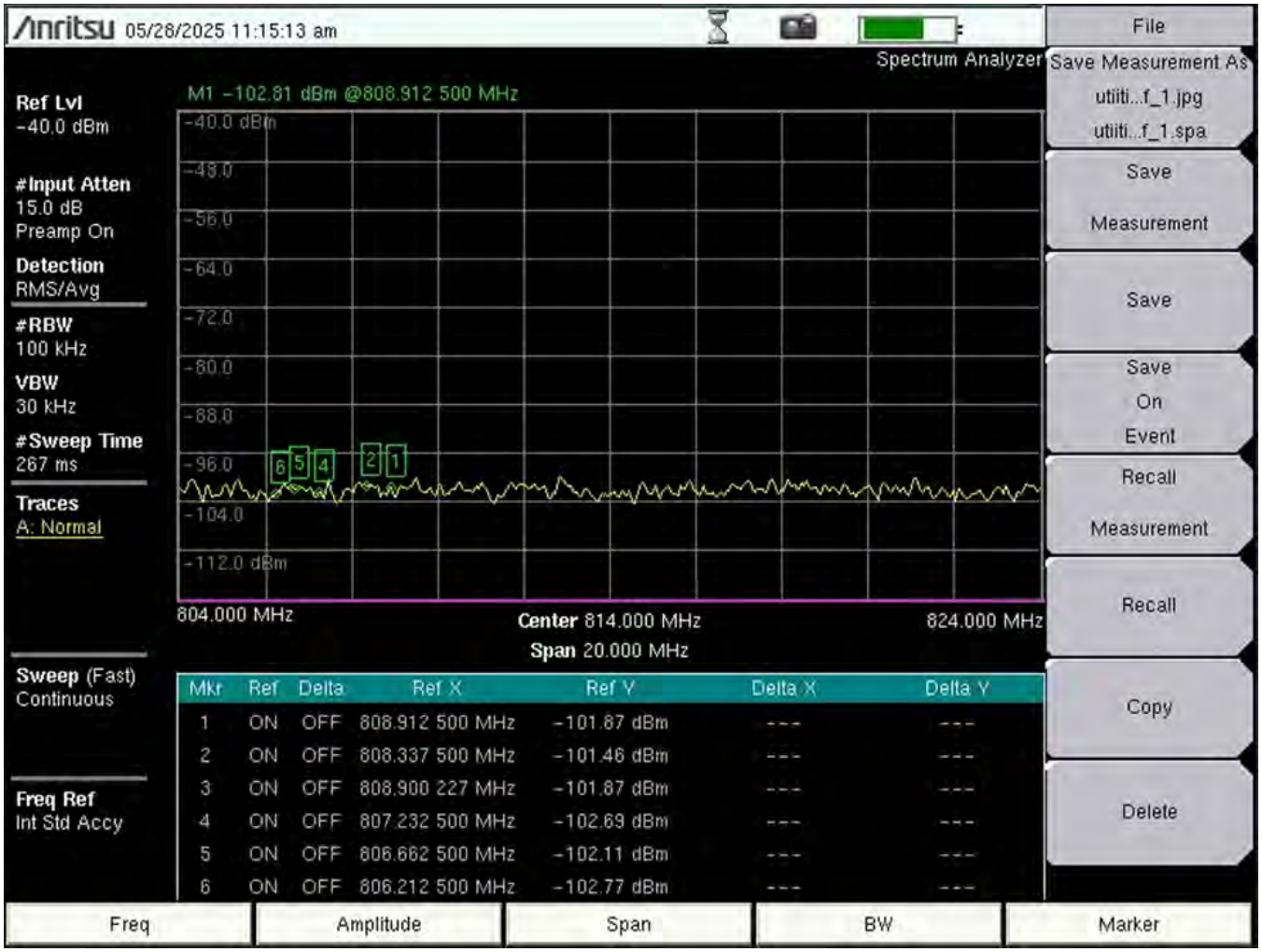


¼-wave antenna measurement

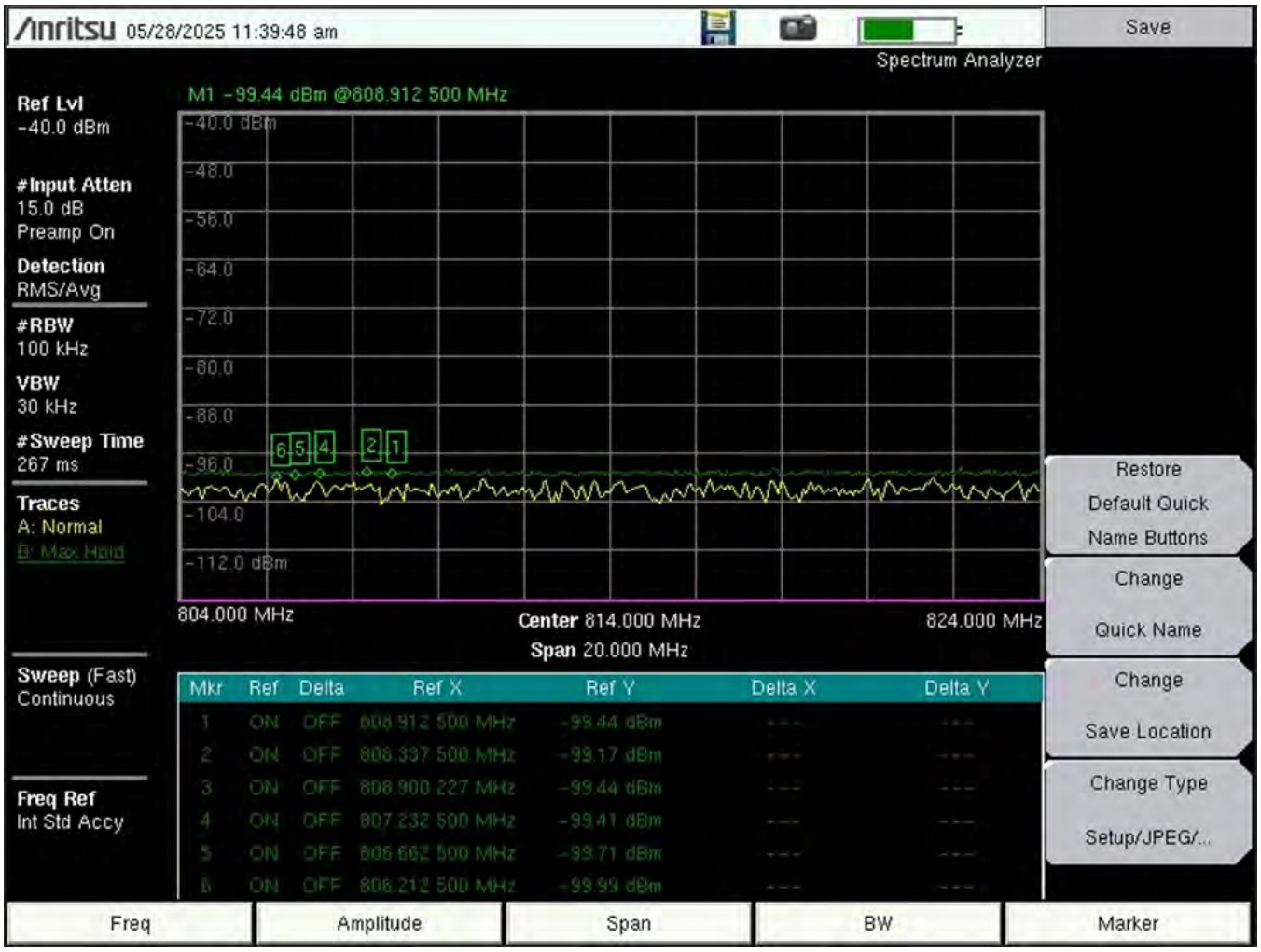


Utilities Tower location

Connected to 50 ohm load

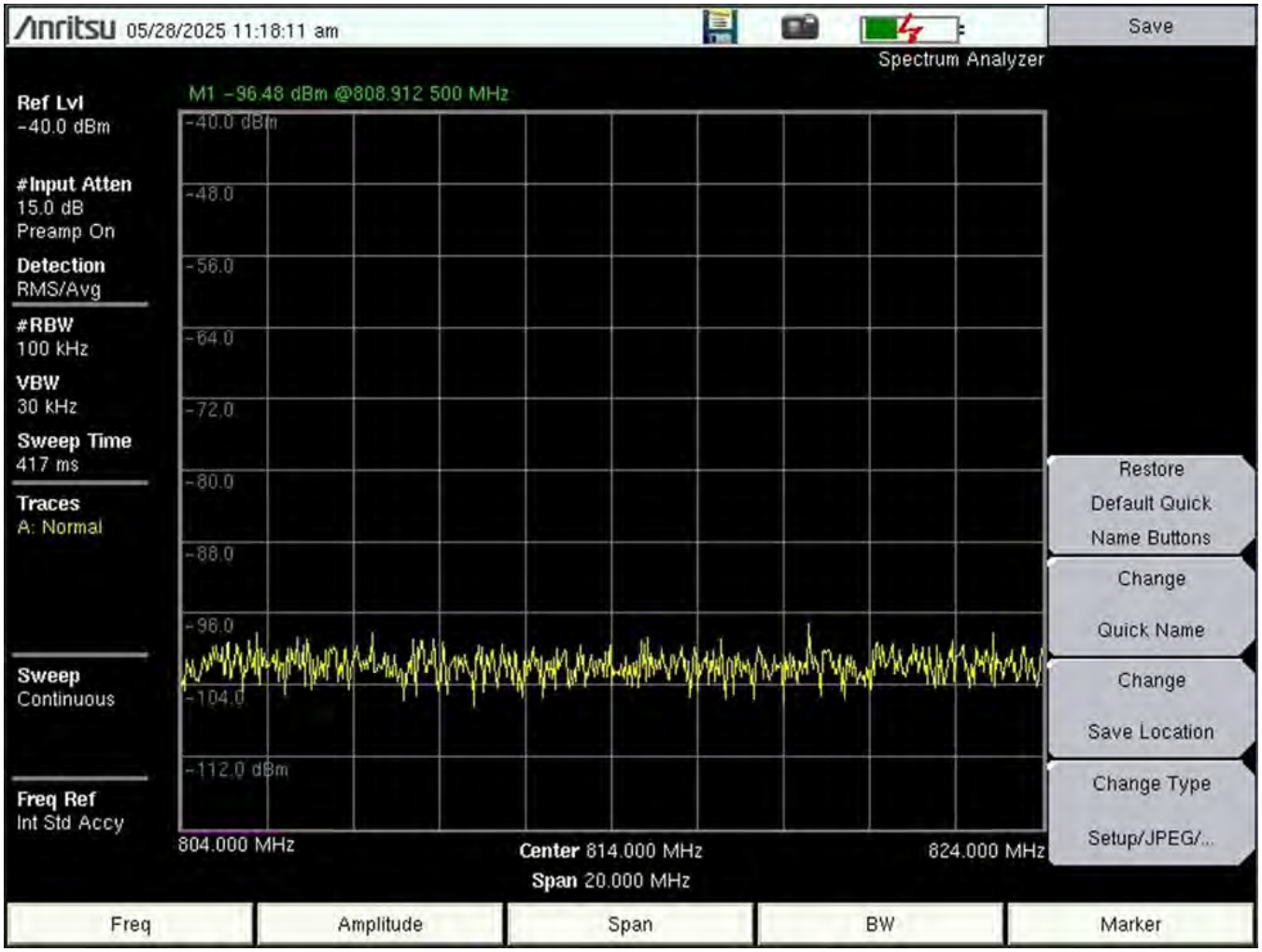


¼-wave antenna measurement

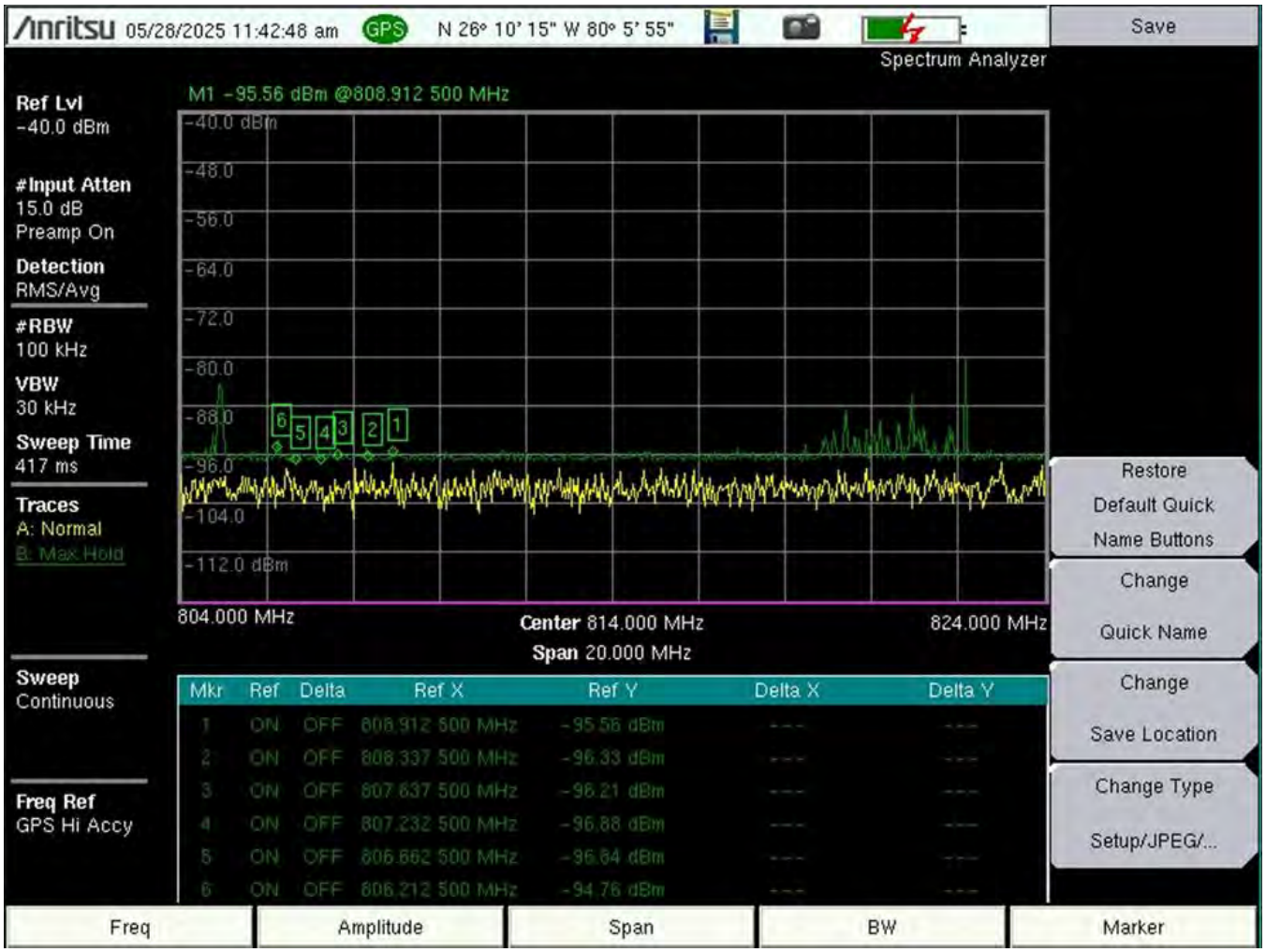


Playa del Sol location

Connected to 50 ohm load

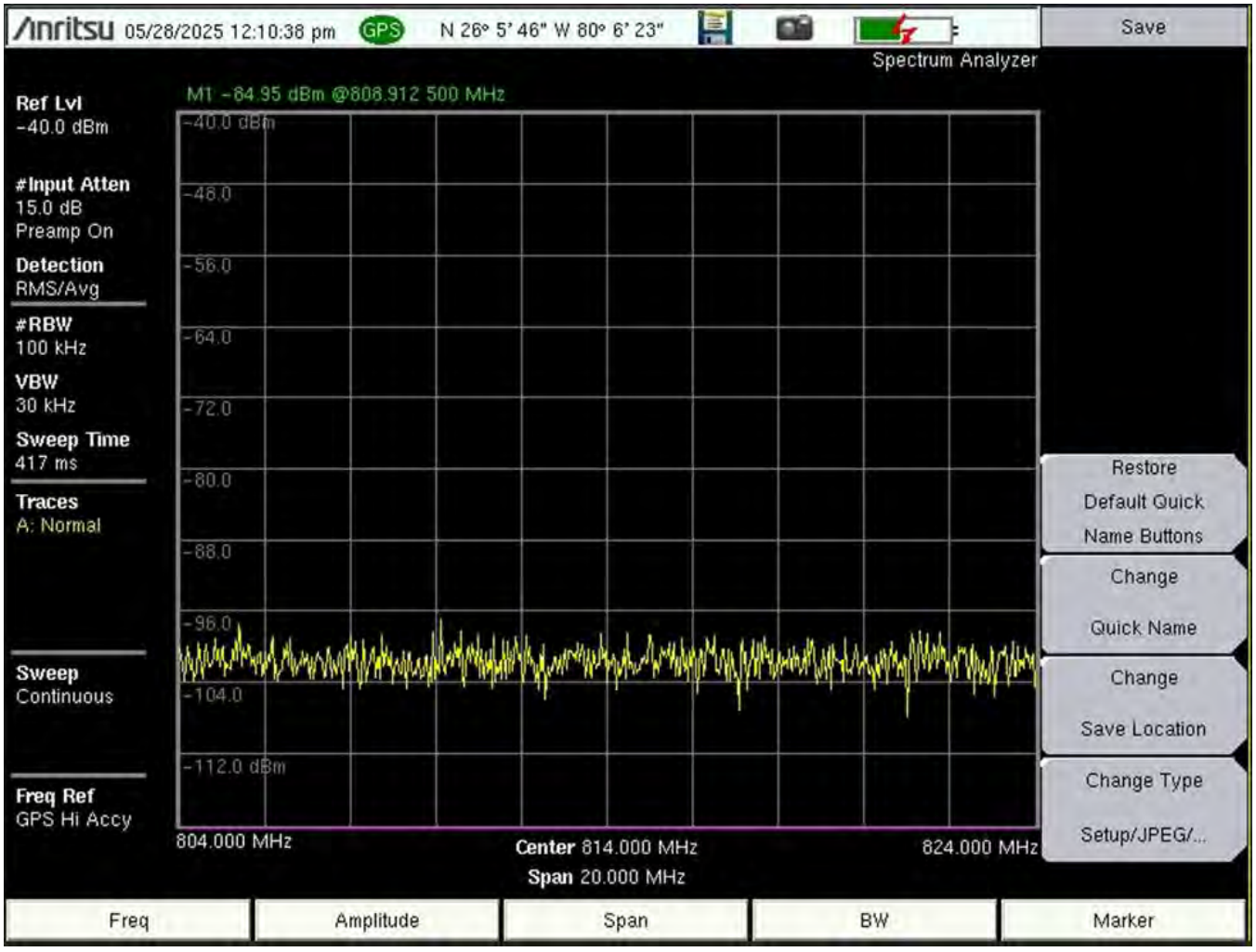


5 dBd antenna measurement

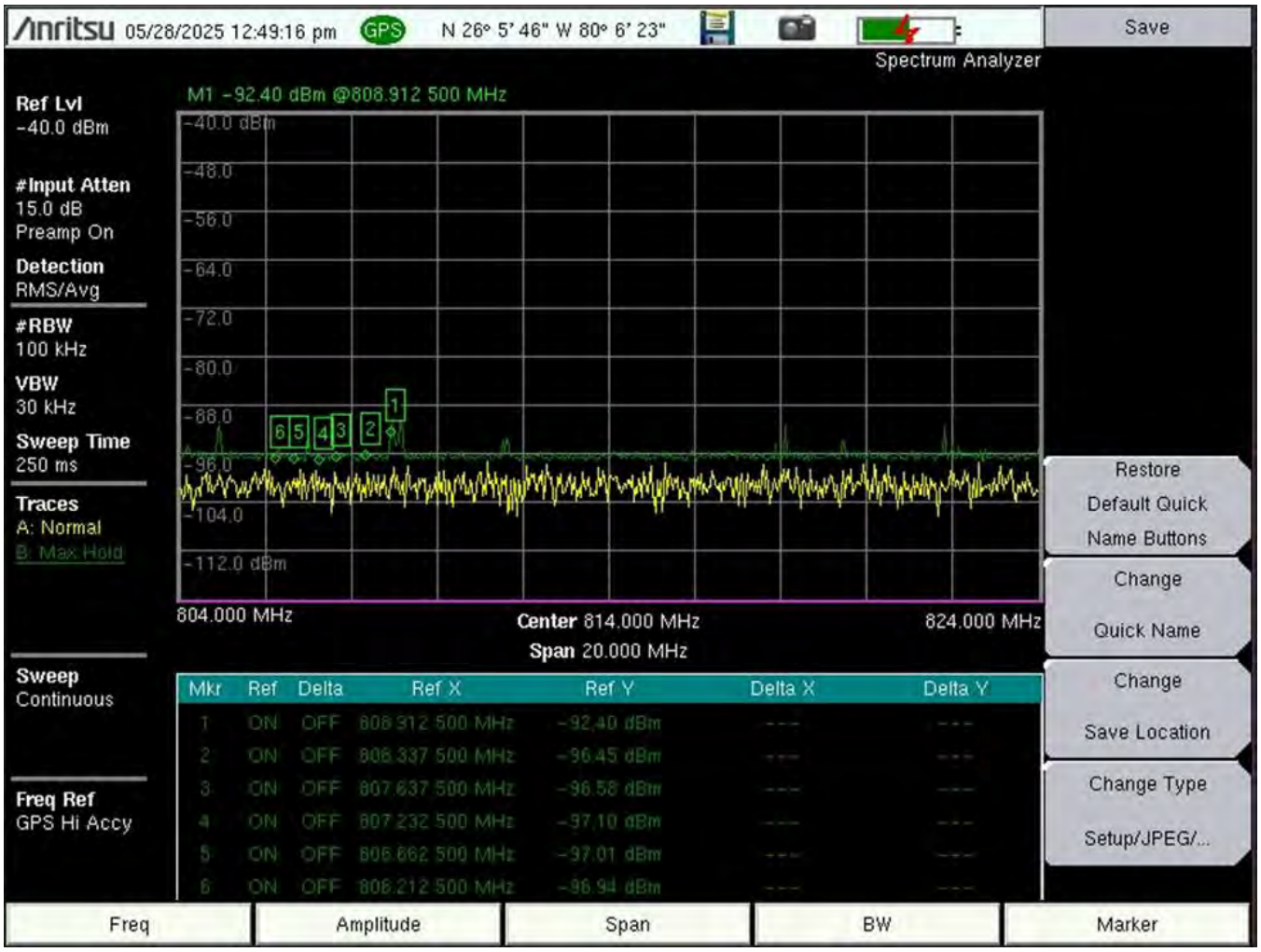


Point of Americas location

Connected to 50 ohm load



5 dBd antenna measurement



Conclusions

The spectrum analyzer plots revealed nothing of concern. The spectrum was relatively flat over the frequency range of interest and barely overcame the analyzer's own noise floor, except at points where a seemingly legitimate transmission was being detected. Signals were picked up at the frequencies of 806.2125, 807.2625, 807.6375, 808.3375 and 808.9125 MHz, particularly at the site of the future State of Florida tower and to a lesser extent at the condominium sites. However these are all channels on Fort Lauderdale's current P25 system, so these are likely to be legitimate transmissions from nearby subscribers.

3.13.3.4 These measurements shall be conducted between the hours of 8 a.m.– 5 p.m. Monday through Friday.

Comply

3.13.3.5 Off hours and holiday periods will not be acceptable periods for measurements.

Comply

3.13.3.6 Ultimate final acceptance of the affected portion of the completed system may be given only if the Customer is shown sufficient information to demonstrate that any observed degradation is beyond the reasonable, Industry-recognized control of the Contractor.

Comply

3.13.3.7 If, however, coverage degradation to the system is found to be within the Contractor's control, then whatever additions, modifications, or costs incurred to resolve the coverage deficiency shall be borne solely by the Vendor.

Comply

3.14 Intermodulation Study Requirement

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

3.14.1 The Vendor shall ensure that the proposed System will be within the accepted limits of Industry- accepted engineering practice, free of interference or degradation due to intermodulation (IM) noise/sideband products.

Comply

Motorola Solutions will conduct an intermodulation analysis based on two–way radio frequencies used in our proposed P25 system plus other frequencies used at the site, a list of which will be provided upon the completion of frequency coordination. Motorola Solutions will not be responsible for any intermodulation issues caused by another system or source outside of our proposed P25 system; however, Motorola Solutions will work with the City of Fort Lauderdale to determine resolutions.

3.14.2 IM study shall be required to be provided by the Contractor prior to the project's the Customer Design Review (CDR) meeting, and subsequent meetings, as the new radio network is deployed.

Comply

3.14.3 This study shall investigate the impact of both trunked system channels as well as those channels utilized by the conventional mutual aid and interoperability subsystem.

Comply

3.14.4 This study shall also include any current co-located equipment that may be present in the shelter and/or tower.

Comply

3.14.5 As part of the Technical Response, the Vendor shall fully describe the planned methodology to develop and complete the required noise and IM studies.

Comply

3.14.6 The Vendor shall submit a representative sample of the noise and IM reporting documentation of sufficient scope and detail to support the methodology, as provided in the Technical Response.

Comply

3.15 Service Area

3.15.1 Portable radio on-street, on the hip with a speaker microphone coverage must extend throughout no less than 97% of that area within the land region encompassed by Fort Lauderdale, FL, including Wilton Manors and Oakland Park, and one-mile outside of Fort Lauderdale at Delivered Audio Quality (DAQ) 3.4 and -95 dBm.

Exceeds

Based on previous guidance provided by the City, Motorola Solutions exceeds this requirement by guaranteeing 97% portable radio on-street coverage extending to two miles outside of the tri-cities, these cities being Fort Lauderdale, Wilton Manors and Oakland Park, thereby exceeding the requested one mile. Testing methods shall follow TSB 88 recommended processes, as outlined in our proposed Coverage Acceptance Test Plan. Our guarantee is based on achieving the required Channel Performance Criterion (CPC) of DAQ-3.4 as measured by bit error rate testing. In a simulcast system as proposed here, received signal strength alone is not a reliable determinant of CPC. A received signal strength of -95 dBm is not required to achieve a CPC of DAQ-3.4 and is no longer a requirement of this RFP based on the City's guidance.

The design presented in this proposal requires a waiver to the Region 9 Regional Planning Committee's Radio Communications Plan requirement that "*The Protected Service Area Contour (PSAC) of a base station is the +40 dBu signal strength contour as calculated by FRIP. The geographical extent of the PSAC [Protected Service Area Contour] is limited to no more than three (3) miles beyond the boundary of the entity's legal jurisdiction*" or agreement by the Committee that the City's jurisdiction extends beyond city limits. To maximize the likelihood of a successful waiver for the contour reach required by an RFP-compliant design, Motorola Solutions has selected channels from the City's current FCC licenses that are not used by nearby incumbents and will maintain the interference protection criteria to all other existing systems. In the event that such approval is not granted, Motorola's guaranteed service area reliabilities would be reduced as necessary to shrink the 40 dBµV/m contour sufficiently to satisfy the above rule or to the extent that the Regional Planning Committee authorizes.

3.15.2 The system shall support mobile radio user coverage throughout the City and two miles outside of the City at 97% coverage at Delivered Audio Quality (DAQ) 4.0.

Comply

Motorola complies with this requirement. The design presented in this proposal requires a waiver to the Region 9 Regional Planning Committee's Radio Communications Plan requirement that "The Protected Service Area Contour (PSAC) of a base station is the +40 dBu signal strength contour as calculated by FRIP. The geographical extent of the PSAC [Protected Service Area Contour] is limited to no more than three (3) miles beyond the boundary of the entity's legal jurisdiction" or agreement by the Committee that the City's jurisdiction extends beyond city limits. To maximize the likelihood of a successful waiver for the contour reach required by an RFP-compliant design, Motorola Solutions has selected channels from the City's current FCC licenses that are not used by nearby incumbents and will maintain the interference protection criteria to all other existing systems. Motorola has also included a preliminary

write up to help the City of Fort Lauderdale justify the waiver request along with precedent examples where waivers were successfully approved.

3.15.2.1 Portable radio coverage within buildings is required.

Comply

3.15.2.2 The system shall support no less than 95% coverage/DAQ-3.4 within residential structures and Law/Fire/EMS facilities and municipal buildings throughout all areas of the Customer.

Exceeds

Motorola Solutions exceeds this requirement in two aspects by guaranteeing an area reliability of 97% portable coverage throughout the required areas, for a loss of up to 15 dB representing residential structures. These guaranteed areas extend to two miles outside of the tri-cities which include Fort Lauderdale, Wilton Manors and Oakland Park, thereby exceeding the requested 95% for residential structures of 8 dB loss. We comply to Law/Fire/EMS facilities and municipal buildings, which are covered at an area reliability of 95%, for a loss of up to 20 dB, representing municipal structures under the provisions of section 3.15.3.

The design presented in this proposal requires a waiver to the Region 9 Regional Planning Committee's Radio Communications Plan requirement that "*The Protected Service Area Contour (PSAC) of a base station is the +40 dBu signal strength contour as calculated by FRIP. The geographical extent of the PSAC [Protected Service Area Contour] is limited to no more than three (3) miles beyond the boundary of the entity's legal jurisdiction*" or agreement by the Committee that the City's jurisdiction extends beyond city limits. To maximize the likelihood of a successful waiver for the contour reach required by an RFP-compliant design, Motorola Solutions has selected channels from the City's current FCC licenses that are not used by nearby incumbents and will maintain the interference protection criteria to all other existing systems. In the event that such approval is not granted, Motorola's guaranteed service area reliabilities would be reduced as necessary to shrink the 40 dBµV/m contour sufficiently to satisfy the above rule or to the extent that the Regional Planning Committee authorizes.

3.15.2.3 Residential structure is described as a single-story house based on local building codes with a minimum typical loss of 8 db.

Exceeds

Motorola Solutions exceeds this requirement by guaranteeing an area reliability based on a loss of 15 dB representing residential structures, thereby exceeding the requested 8 dB. Since the decibel (dB) scale is logarithmic, when considered in linear terms, this equates to more than a quadrupling of the tolerated building loss versus the requested loss.

3.15.2.4 Structures greater than one-story shall require coverage on all floors above grade.

Comply

Motorola complies as to the buildings listed in Appendix D and for schools up to 25dB of building loss. These structures will be tested per the procedure documented in the proposed Coverage Acceptance Test Plan.

3.15.2.5 In addition, portable radio coverage to this same or greater reliability and audio quality is required within a specific set of critical building locations and critical areas, as listed in Appendix D Critical Building/Area List.

Comply

3.15.3 The system shall support no less than 95% coverage within critical buildings and other type 20dB structures within the city limits of the following cities plus one mile outside the border and along the corridor of major roads with a one-half mile boundary on either side.

Comply

We understand the reference to "the following cities" to refer to the cities of Fort Lauderdale, Wilton Manors and Oakland Park.

The design presented in this proposal requires a waiver to the Region 9 Regional Planning Committee's Radio Communications Plan requirement that "*The Protected Service Area Contour (PSAC) of a base station is the +40 dBu signal strength contour as calculated by FRIP. The geographical extent of the PSAC [Protected Service Area Contour] is limited to no more than three (3) miles beyond the boundary of the entity's legal jurisdiction*" or agreement by the Committee that the City's jurisdiction extends beyond city limits. To maximize the likelihood of a successful waiver for the contour reach required by an RFP-compliant design, Motorola Solutions has selected channels from the City's current FCC licenses that are not used by nearby incumbents and will maintain the interference protection criteria to all other existing systems. In the event that such approval is not granted, Motorola's guaranteed service area reliabilities would be reduced as necessary to shrink the 40 dBµV/m contour sufficiently to satisfy the above rule or to the extent that the Regional Planning Committee authorizes. To aid in the application of this waiver request, Motorola has provided a detailed document in Attachment 14 which can be used as a reference for the application.

3.15.4 The vendor should put an emphasis on providing reliable coverage in all schools regardless of the loss factor for each school.

Comply

Motorola Solutions has analyzed the predicted coverage using 25 dB as the maximum building penetration loss value for given test points for all schools. Schools will be tested per the procedure documented in the proposed Coverage Acceptance Test Plan, which states that failed test points that exceed 25 dB loss will be removed from the reliability calculations for the building.

3.15.5 The vendor will guarantee coverage in all schools at no less than 95% coverage at 25db.

Comply

Motorola Solutions has analyzed the predicted coverage using 25 dB as the maximum building penetration loss value for given test points for all schools. Schools will be tested per the procedure documented in the proposed Coverage Acceptance Test Plan, which states that failed test points that exceed 25 dB loss will be removed from the reliability calculations for the building.

3.16

All references to coverage reliability in this RFP refer to statistical area reliability.

Understood

3.16.1 For example, the phrase "95% coverage" indicates that the total area described shall exhibit at least 95% statistical probability that coverage areas, if tested, would be found to support electrical performance which equals or exceeds that minimum signal level necessary for that Contracted delivered audio quality.

Understood

3.16.2 Use of cellular capabilities will not be permitted in order to successfully pass a coverage grid. Only LMR coverage will be permitted.

Comply

3.16.3 It will not be acceptable to provide a coverage guarantee which includes a relatively large number of failed points within any single vicinity, while still meeting the overall goal of 95% coverage.

Comply

3.16.4 It will not be acceptable to have a failure of six or more contiguous test points/grids.

Comply

3.17 Propagation Analysis

3.17.1 The Vendor shall provide written descriptions of the processes and propagation models used to calculate proposed area coverage objectives.

Comply

3.17.2 Coverage maps and other pertinent calculations must be submitted with the following minimum information clearly defined for each map or submittal:

Comply

3.17.2.1 Transmitter site power output.

Comply

3.17.2.2 Antenna gain and type (Include transmission line losses).

Comply

3.17.2.3 Effective signal level necessary, at both infrastructure and user radio antenna ports, to produce DAQ 3.4 delivered audio quality in the typical land mobile radio environment (inclusive of noise floor degradation, if any).

Comply

3.17.2.4 Antenna height.

Comply

3.17.2.5 Portable unit effective radiated power.

Comply

3.17.2.6 Portable unit effective receiver sensitivity.

Comply

3.17.2.7 Transmitter site talk out range, individual sites as well as composite coverage.

Comply

3.17.2.8 Portable unit talk-in range, individual sites as well as composite coverage.

Comply

3.17.2.9 A statement defining the percentage of land area covered shall be provided for each submitted map configuration.

Comply

3.17.2.10 Okamura modeling should be used for propagation projection.

Comply

3.18 Radio System Coverage Acceptance Criteria

3.18.1 Verification of the installed system's coverage is a component part of the Test and Acceptance criteria described in Section 3.45 Phased Implementation.

Understood

3.18.2 Vehicular coverage testing (performed within a road vehicle during terrestrial coverage testing or watercraft when performing river or lake coverage testing) shall be done with computer-controlled test equipment.

Comply

3.18.2.1 This equipment shall automatically record the position of the test vehicle (by means of GPS positioning) at the time of a reading and records the signal strength of at least 200 signal samples over a 40-wavelength period for each reading taken within a test grid. Signal strength measurements shall be made continuously along the drive route.

Comply

3.18.3 Test grid sizes within all city limits shall utilize grid sizes no greater than 1320 feet x 1320 feet (1/4 mile). Grids sizes within rural areas shall be 2640 feet x 2640 feet (1/2-mile).

Comply

3.18.4 A minimum number of accessible grids, sufficient to provide statistical accuracy of results in the order of 1.25db or less, shall be tested.

Comply

Motorola Solutions follows TSB-88.3-D Estimate of proportions section to determine the appropriate number of test tiles.

3.18.5 The Customer and the Contractor shall mutually determine the size/location of grids and a suitable drive route that encompasses the entirety of accessible grids. This testing shall apply to any area capable of being traversed by a 4x4 vehicle. Inaccessible grids will be excluded from the coverage result calculations.

Comply

3.18.6 Field strength test results obtained throughout the coverage area, in accordance with minimally required reliability percentages, shall be of sufficient level to produce a Delivered Audio Quality (DAQ) rating of 3.4 or higher where required (see below - Figure 1 Chart) throughout the predicted service area to be considered passing.

Comply

Motorola Solutions follows the definition of DAQ 3.4 as defined in TIA's TSB-88.1-F Table 3 Delivered Audio Quality (or most recent version available).

3.18.6.1 Figure 1 Chart

Comply

DAQ Rating | Explanation

5 | Reception is very clear, and the message is perfectly readable. No background noise is present, and every word is understood.

4 | Reception is clear, but with slight background noise. Message is readable, and every word is understood.

3.4 | Reception is clear, but with slight background noise. Message is readable and understood with few/occasional missing syllables.

3 | Background noise is evident. Message is readable and understood even with missing syllables.

2 | Background noise is prevalent. Message is readable with difficulty and requires repetition.

1 | Evidence that transmission is being made. Voice message is barely discernible, and no words are understood. Unusable.

0 | No transmission is heard. No activity on the channel is evident.

Notes | CPC is set to the midpoint of the Range. SINAD values are NOT to be used for system performance assessment.

3.18.7 Mobile radio signal strength measurements shall be made from either a terrestrial (land) vehicle moving at approximately 35 mph, or a watercraft (river/lake/ocean/waterway) vehicle traveling at approximately 20-knots.

Comply

3.18.8 The device used to measure field intensity shall be stable and have a dynamic range suitable for the conditions under test.

Comply

3.18.9 Prior to the execution of these test activities, all test equipment and data gathering equipment to be used shall be fully certified by an independent testing laboratory having calibration tools traceable to the National Institute of Standards and Technology. These certification documents shall be presented to the Customer's project staff prior to coverage testing.

Comply

3.18.10 The test output shall be retained by a laptop computer or an equivalent computer device. The Contractor shall submit a written and/ or graphical report containing an analysis of the test results to the Customer daily, and a formal report at the end of the test.

Comply

3.18.11 The Contractor's analysis shall include maps of the coverage area divided into grids, with the test results for drive tests displayed in each grid on a separate map.

Comply

3.18.12 All test data, in its raw form, shall be made available for independent inspection.

Comply

3.18.13 The Customer reserves the right to reject any instrumentation or procedures.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Comply

Motorola Solutions complies subject to the understanding that the CATP provided in the proposal, or such version as negotiated prior to contract signing, will be deemed as acceptable and any rejection of instrumentation must be reasonable.

3.18.14 During these tests, the system's P25 transmitter(s) output power shall be monitored by the Customer and no adjustments shall be made to the base station(s), antenna system(s), transmitter(s), portable/mobile radio units or test instrumentation after appropriate calibration of all involved equipment.

Comply

3.18.15 Optimization data for the infrastructure will be provided to the Customer prior to the commencement of these tests.

Comply

3.18.15.1 Optimization data will include at a minimum, antenna sweeps, TX power measured at the base station output and the combiner output, receive sensitivity, and any other data deemed necessary to prove the system is optimized and ready for testing.

Comply

3.18.16 Should The Customer reject any portion of the test, the Contractor shall correct the errors and omissions as defined by the Customer at no additional cost.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Comply

Motorola Solutions complies with the understanding that any rejection must be based upon Motorola Solutions failing the test as outlined in the CATP.

3.19 Audio Quality Test Process

3.19.1 In addition to the signal level collection method described above, the Contractor shall be required to conduct a voice audio quality test of the system.

Comply

3.19.2 The P25 digital portion of the new radio system shall encompass an automated BER Test for both in-bound and outbound transmission pathways.

Comply

3.19.3 The Contractor shall, as part of its Acceptance Test, produce a BER Test Report that correlates actual BER to predicted results.

Comply

3.19.4 Of those accessible grids evaluated because of the field-testing process, no fewer than 95% shall achieve a BER that is directly correlated to DAQ-3.4, as defined by EIA/TIA TSB-88D, as depicted by Figure 1.

Comply

The definition of DAQ 3.4 shall be that which is defined in TIA's TSB-88.1-F Table 3 Delivered Audio Quality (or most recent version available).

3.19.4.1 A call transmission failure in either direction shall be considered a failure of the tested grid.

Comply

3.19.5 The BER test shall encompass the same grid structure as devised for the signal level test process.

Comply

The BER test will determine the pass/fail outcome of the test. Signal levels will be collected for information only.

3.19.6 A manually-conducted voice quality test simulating in-residence portable radio operations shall also be conducted.

Comply

3.19.6.1 In conducting portable voice quality testing, vehicular-mounted mobile radios and proposed portable radios will be utilized in Contractor-equipped vehicles, but with appropriate transmission line attenuators installed to replicate outdoor portable radio operations.

Comply

3.19.6.2 The Customer's service area shall be comprised of test grids equal to those used in BER testing.

Comply

3.19.6.3 Test calls for each grid will be transacted, as required vehicle-to-base/console and base/console-to-vehicle or portable-to-base/console and base/console-to-portable, with the results for each call segment scored as per TSB-88D recommendations.

Comply

3.19.6.4 No fewer than 97% of the total number of grids tested in this manner shall be ranked as achieving DAQ-3.4 audio quality, or higher.

Comply

3.19.6.5 A failure in either call direction shall be considered as a failure of the tested grid.

Comply

3.19.7 The following voiced audio quality verification process shall apply:

Comply

3.19.7.1 The portable radio voice quality testing shall be performed using a minimum of ten phonetically balanced phrases, to be supplied by the Contractor.

Comply

3.19.7.2 A successful test measurement shall be one which requires no repetition, and as defined in Figure 1 to understand the spoken phrase and with a DAQ-3.4.

Comply

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Motorola Solutions complies with the understanding that any rejection must be based upon Motorola Solutions failing the test as outlined in the CATP.

3.19.7.3 A successfully tested grid is defined as one in which communications from a dispatch console to a field radio unit, as well as for the reverse path, are not less than DAQ 3.4 as described above.

Comply

3.19.8 The Customer shall designate the test team(s) to participate in coverage testing.

Comply

3.19.9 All test vehicles shall be provided by the Contractor and be off-road capable.

Comply

3.19.9.1 Where boats are required, these shall be provided by the Customer.

Comply

3.19.10 Testing shall commence daily at 8:00 AM and will cease at 4:30 PM.

Comply

3.19.11 At least three teams will conduct the tests in the interest of timely completion.

Comply

3.19.12 Failure of Contractor test equipment shall not be considered as an acceptable reason for a Contract time extension.

Comply

3.19.13 The Customer will not pay for retesting caused by delays or equipment failures.

Comply

3.19.14 Testing will proceed through weekends and during peak foliage until concluded.

Comply

3.19.15 Final System Acceptance shall not be achieved until the constructed system successfully equals or exceeds the coverage performance guaranteed by the Contract.

Comply

3.20 Critical Building Coverage Test Process

3.20.1 Coverage shall be no less than 95% inside of the listing of representative buildings contained in Appendix D Critical Building/Area List.

Comply

Indoor coverage testing will be performed according to the in-building testing procedure documented in the CATP in **Attachment 15 – 3.1.14.2.D Sample Acceptance Test Plan**.

3.20.1.1 It is desired that most of these building structures shall be supported by the proposed fixed infrastructure (tower sites).

Comply

Indoor coverage testing will be performed according to the in-building testing procedure documented in the CATP **Attachment 15 – 3.1.14.2.D Sample Acceptance Test Plan**.

3.20.1.2 However, the Vendor shall exercise good judgment in balancing the proliferation of costly infrastructure tower sites with the number of building sites.

Comply

Indoor coverage testing will be performed according to the in-building testing procedure documented in the CATP **Attachment 15 – 3.1.14.2.D Sample Acceptance Test Plan.**

3.20.1.3 The use of building amplifier systems, while necessary in some instances, shall likewise be minimized to the most practical and fiscally responsible extent possible.

Comply

3.20.2 The Vendor shall specifically identify those buildings from that list that are likely to require building amplifier systems in their proposal.

Comply

Motorola's critical building coverage modeling predicted that no building in RFP Appendix D has a greater than 1% chance of needing a building amplifier system, when building loss is assumed not to exceed 20 dB.

These predictions suggest that no building from RFP Appendix D is likely to require a building amplifier system.

3.20.3 If any of these representative buildings fail to demonstrate 95% reliable coverage (DAQ 3.4 Audio Quality), the following procedure will be followed:

Comply

3.20.3.1 The Vendor must propose a detailed testing method showing how the failed building will be tested to verify that it does or does not meet the in-building coverage criteria. Testing shall not be limited to the ground floor.

Comply

3.20.3.2 If System radio coverage gaps are identified versus Vendor as-proposed coverage models, the Contractor will be responsible for modifying the System, at no additional cost to the Customer, to achieve the required coverage within the failed building.

Comply

3.20.3.3 Remediation may include any or all the following approaches, as mutually agreed by the City and its Consultant:

Exceeds

Motorola Solutions has included an allowance to address the requirement to potentially provide the types of system listed in paragraphs A through C below, in the event that buildings require remediation.

If the actual costs exceed the allowance, Motorola Solutions will work with the City of Fort Lauderdale for approvals and invoicing. If the actual costs are less than the stated allowance, Motorola Solutions will provide a Technology Credit to the City of Fort Lauderdale.

To further assist the City with any in-building coverage challenges that arise during day-to-day First Responder operations, Motorola has included five (5) 700 MHz DVR-LX suitcase-format Digital Vehicle Repeater systems as additional coverage support for public safety users with this proposal. (700 MHz operation was selected as DVR systems typically have to operate in an alternate band for adequate frequency separation from the P25 channels.) The DVR-LX integrates with an APX series mobile radio

to function as compact 10-Watt vehicle repeater installed in the back of a patrol car or fire apparatus. The higher power APX mobile radio extends the range of the portable radio back to dispatch.

A. Bi-directional amplifier (BDA) system installed in the building.

Comply

B. Passive repeater systems installed in the building.

Comply

C. Satellite receiver systems in or near the building.

Comply

D. Modifying/adjusting repeater site antenna systems.

Comply

3.20.3.4 The determination to utilize a BDA within any structure shall be engineered as a part of a comprehensive system design.

Comply

A. The Contractor shall not install any BDA system in structures that shall introduce interference into the overall P25 System operation.

Comply

3.20.3.5 If any changes are made to the fixed sites (such as re-orienting antenna patterns) in order to resolve building coverage failures, then a complete re-test of coverage shall be required at no additional cost to the Customer.

Comply

3.21 Dispatch Console Requirements

3.21.1

The Customer requires new Dispatch Consoles as part of this project.

Understood

3.21.2 Parallel Implementation

3.21.2.1 The vendor shall be responsible for ensuring the Customer’s existing/legacy radio configuration remain operationally available during the installation and acceptance phases of the P25 System.

Comply

Motorola's proposed migration plan is included in Section 3.44.1.

3.21.2.2 The Customer will permit the co-location of new dispatch console equipment with this legacy equipment during the project's user migration phase and until project acceptance.

Comply

3.21.2.3 Any solution that would cause the temporary interruption of the existing radio system for any duration must be reviewed and approved, in advance, by the affected entities and the Customer.

Comply

3.21.3 Console Locations and Quantities

3.21.3.1 The Customer currently utilizes one dispatch center for 911, Law, Fire, EMS, and other public safety agencies.

Understood

A. The dispatch center is located at 1300 W. Broward Blvd. Fort Lauderdale, FL 33312

Understood

B. There is a quantity of (6) consoles at this location.

Comply

3.21.3.2 Customer has a backup dispatch center.

Understood

A. This backup location will have eight (8) additional consoles.

Comply

B. The new location will include a monopole tower if required, microwave connectivity to the P25 radio system, and DC battery backup for the microwave.

Comply

In full compliance to the RFP, Motorola has included the Backup Dispatch Site in the proposed microwave ring, facilitated by a proposed 80 ft monopole tower to be erected at the 2200 Executive Airport Way facility. The 80 ft monopole is necessary to achieve sufficient line-of-sight clearance for RFP-compliant, high-availability microwave paths. Due to its close proximity to the airport, any antenna structure being considered at this location will require an FCC filing and will trigger an aeronautical hazard study by the FAA. It is Motorola's opinion that an 80 ft monopole has a low likelihood of gaining FAA approval, judging from the minimal heights observed for nearby existing structures.

Motorola has therefore included contingency pricing for the Executive Airport Way facility to alternatively be connected by ASTRO Connectivity Services (which would bring a fiber circuit to the location, augmented by LTE backup) instead of microwave, in the event that FAA authorization for the monopole is denied.

1. Based on the system design, the vendor proposal should identify the heights and location of any tower required to meet the specifications and support the proposed design including this monopole.

Comply

This proposal includes an 80-foot-tall monopole to accommodate a microwave dish height of 70 feet above ground level. The exact positioning of the monopole tower within the property will be subject to a detailed site survey of the facility, which as not included in the City-led site walks of December 2, 2025, and the precise location will be chosen in consultation with the City.

C. The backup dispatch center is located at 2200 Executive Airport Way, Fort Lauderdale, FL 33309.

Understood

D. There is a quantity of (8) consoles planned for this location.

Comply

3.21.4 Installation Specifications

3.21.4.1 Vendor shall install new radio dispatch equipment cabling that must, likewise, be completed in a manner that causes no interference with the operation of the existing legacy network.

Comply

3.21.4.2 Vendor shall carefully evaluate dispatch facilities prior to initial design review to determine the most effective means to install and implement its new dispatch console equipment and associated subsystems.

Comply

3.21.4.3 The installation of the Video Display(s) used for the radio dispatch positions shall be capable of desk mounted on furniture or dispatch console furniture display arms.

Comply

3.21.4.4 Contractor-furnished cabling shall be neatly installed and protected from physical damage.

Comply

3.21.4.5 Installation plans must be reviewed and approved by the Customer prior to physical installation.

Comply

3.21.4.6 Cable raceways shall be used where possible.

Comply

3.21.4.7 No cabling shall create a safety or mobility problem for dispatch personnel.

Comply

3.21.5 Reliability/Resiliency

3.21.5.1 Due to the critical nature of the communications services provided by these public safety dispatch facilities, a high degree of reliability for the new radio dispatch console subsystem is required.

Understood

3.21.5.2 The console subsystem, to the greatest extent possible, shall:

Comply

A. Be automatically self-correcting.

Comply

B. Auto Diagnostics/Self-Healing and Diagnostic Features

Comply

1. The new dispatch console subsystem shall be equipped with several self- diagnostic elements that continuously monitor and verify the correct operation of each distributed microprocessor, each audio path in the console electronics, and between the console electronics and the system.

Comply

*Attach Self-Testing and Diagnosis Documentation

Comply

Please refer to section of **Attachment 25 – 3.21.5.2.B1 Self-Testing and Diagnosis Documentation.**

2. Diagnostic capability shall be distributed among independent and redundant subsystems and shall not rely on one central diagnostic circuit.

Comply

*Attach Distribution of Diagnostics Documentation

Comply

Please refer to section **Attachment 26 – 3.21.5.2.B2 Distribution of Diagnostics Documentation.**

3. In the case of voice transactions using the Internet Protocol, specialized coding shall be used to assure the timely delivery of audio packets to destinations such that recovered or transmitted audio is absent of noticeable voice delays or audio truncation.

Comply

C. Alert the operator in the event of component or sub-system failure.

Comply

D. Allow continued operation of the remaining consoles in the event of failure to a specific console, through isolation of the defective console device.

Comply

E. Be of a design that eliminates single points of failure.

Comply

F. Utilize packet-based, in lieu of traditional circuit-switched, technologies.

Comply

G. Modularity is likewise envisioned to reduce the number of sub-systems affected by a single component failure.

Comply

H. Repair of sub-systems without totally disabling multiple radio console positions shall be required, as continued console operation is necessary during repair.

Comply

*Attach Console Modularity / Repair Documentation

Comply. Please refer to section 1.1.7.8 of **Attachment 17 – 3.4.13.2.F Functional Description of Proposed Broadband Gateway Platform or Solution (Solution Description)** for information on APX Consolettes.

3.21.6 Console Auxiliary I/O Functions

3.21.6.1 All external auxiliary input and/or output (Aux I/O [logic or relay]) functions shall be controlled through an auxiliary interface module.

Comply

3.21.6.2 These functions shall be controlled from the console position as required.

Comply

3.21.6.3 The Aux I/O shall be capable of operating an alternative 3-light status light/alert system, supplied by the Vendor, to indicate each position is operating a radio transmission, or telephone call, on each console position.

Comply

3.21.7 Console Minimum Features/Functionality

3.21.7.1 Electronic Specifications

Comply

A. Console electronic circuitry shall be housed in an equipment rack/enclosure specific for each dispatch console position.

Comply

B. When installed by the Contractor, sufficient space for front and rear servicing of this equipment shall be provided.

Comply

C. The use of a centralized console electronic bank that supports audio and control signaling between multiple dispatch console positions is non-compliant and will be rejected.

Comply

D. Console electronic enclosures shall contain the various microprocessors, console interfaces, auxiliary function interfaces and other interfaces needed for radio dispatch operations.

Comply

E. If multiple circuit cards are required within the Vendor's enclosure solution, these shall be of plug-in design and shall be able to be inserted and/or removed with power applied and the location's other dispatch positions/equipment remaining on-line.

Comply

1. The digital voice network's radio dispatch subsystem shall include the circuitry required to operate remotely-controlled base stations and the system repeaters as described by this RFP.

Comply

F. At a minimum, each base station interface shall consist of a plug-in circuit card (or the software equivalent) containing VoIP-related circuitry, line driver amplifiers, two- wire and four-wire receive amplifiers, digital automatic level adjustment circuitry and fault diagnostic circuitry.

Comply

G. The interface shall also be capable of remotely controlling base stations via E/M multiplex-channel, and 2175Hz tone-burst signaling, as may be needed for legacy equipment.

Comply

*Power Supply/Backup Power Attach UPS Documentation

Comply

See **Attachment 28 – 3.21.7.1.G Power Supply_Backup Power – UPS Documentation.** Motorola Solutions assumes the City of Fort Lauderdale will provide UPS circuits for back room electronics along with a backup generator at the dispatch center. Motorola Solutions will provide the anticipated (maximum) load for the proposed equipment that will be added to the dispatch center to ensure proper sizing/operation of the UPS and generator.

1. It is a critical requirement that power loss or surges shall not affect radio dispatch operations.

Comply

a. Power loss or surges shall not alter the system software or operating parameters at the radio dispatch positions.

Comply

Per RFP sub-paragraph (c) below, Motorola Solutions assumes the City of Fort Lauderdale will provide UPS circuits for back room electronics, along with a backup generator at the dispatch center. Motorola Solutions will provide the anticipated (maximum) load for the proposed equipment that will be added to the dispatch center to ensure proper sizing/operation of the UPS and generator.

b. External power to each console shall be supplied by a nominal 120VAC, 60Hz, single-phase power source.

Comply

H. The proposed UPS will have a graphical display that shows battery life and voltage incoming and outgoing on the device.

Comply

I. All dispatch consoles shall be capable of operation without commercial power for at least 2 hours.

Comply with Clarification

This requirement was originally interpreted against RFP sub-paragraph (G) (c), whereby all dispatch console equipment was to have been connected to a circuit protected by an *existing,* centralized UPS. Based on previous guidance provided by the City, we have added to our proposal an 850VA UPS for each console position. Desktop or furniture-enclosable UPS devices are typically only designed to provide a few minutes of backup power unless run very far below their rated capacity. The proposed UPS is designed to provide about 10 minutes of backup power until the City-provided building generator kicks in, whereupon the generator would be expected to provide the two hours or more of backup power. It would be impractical to provide two hours of backup solely from an individual UPS unit deployed at each console location, as this would require a UPS device that is larger than can typically be accommodated in or around console position furniture, to sustain the estimated 300 watts of load required by each console position.

3.21.8 Flat Panel Display

3.21.8.1 A state-of-the-art color, non-interlacing minimum 22-inch display shall be provided.

Comply

3.21.8.2 Each operator shall have the ability to change screen displays to suit operator preferences.

Comply

The AXS dispatch console will allow individual flexibility in iconography, color palette, alert tones, day/night mode operation and multi-modal interaction (touch, click, type).

Customizable Colors

Create a unique visual experience with the colors of your choice or choose a predefined color theme. Customizable color elements include resources, folder groups, buttons and more.

Customizable Iconography

Choose from a wide array of icons from our library or upload the icons your agency already uses.

Customizable Alert Tones

Choose from a wide array of alerts and tones from our library or upload any .wav sound file to the library.

Agency Identity

Add your agency's unique emblem or logo within the user interface.

Day and Night Mode Operation

Select light or dark mode for optimal viewing in either light or dark environments, reducing eye strain.

Configurable Tab and Folder Organization

Take control of the layout with the ability to quickly and easily organize it as you see fit. With the availability of dynamic and fixed folders you can always have important resources front and center.

Agency or Individual Configurations

Customize the console's look and feel for an individual user or create an agency wide look and feel.

Multi-modal Interaction Flexibility

The AXS Dispatch Console is designed around simple, intuitive touch capabilities, so you can respond faster by going right to the resource on screen that you need. No more fumbling for a mouse during a crisis situation. Of course, we also understand that the job sometimes requires using a keyboard and mouse so you have those options too.

3.21.8.3 No less than eight console preferences shall be configurable for each console.

Exceeds

The CommandCentral AXS Dispatch GUI supports the creation of resource folders for organizing the various resources (radio resources, auxiliary input/output resources, etc.) which are assigned to the dispatch client. The number of useable folders that can be placed on the GUI is only limited by the size of the monitor and the resolution it is using. These folders may be given descriptive names to simplify the organization of the resources.

3.21.8.4 The screen(s) are required to be touchscreen.

Comply

*Attach Flat Panel Display Documentation

Comply. See **Attachment 29 – 3.21.8 Flat Panel Display Documentation.**

3.21.9 Headset Jack

3.21.9.1 All radio consoles shall, at a minimum, accommodate both right-handed and left-handed operators.

Comply

3.21.9.2 All radio consoles shall be configured for dual headset and local microphone operations.

Comply

3.21.9.3 Each console shall provide independent transmit audio level settings for audio inputs from the headset microphone and a desktop microphone, such that telecommunicators may freely switch operation without affecting dispatch audio quality.

Comply

The headset jack contains two volume controls; one for adjusting the level of received radio audio and one for adjusting the level of received telephone audio. A small dimple is molded into the headset jack housing near the telephone volume control so the dispatcher can tell them apart without having to look at them.

3.21.9.4 Dual headset jacks shall be provided at each position for training and supervisory purposes.

Comply

*Attach Headset Jack Documentation

Comply. See **Attachment 30 – 3.21.9 Headset Jack Documentation.**

3.21.10 Footswitch

3.21.10.1 The Contractor shall supply and install a switch for each console.

Comply

3.21.10.2 Each footswitch will operate PTT of the selected channel(s).

Comply

3.21.10.3 The footswitch shall be heavy duty, rated for constant and continuous use, and shall be designed so as not to skid on a smooth flooring surface.

Comply

*Attach Footswitch Documentation

Comply. See **Attachment 31 – 3.21.10.3 Footswitch Documentation.**

3.21.11 Master Time Source

3.21.11.1 A time generator system shall be provided, by the Contractor, that references the Global Positioning System to synchronize all dispatch clocks and logging recorders at all radio console positions/centers.

Comply

A. The use of standard NTP server mechanisms over the internet is not an acceptable solution.

Comply

3.21.11.2 This time generator system shall be made to fully interface to and control the event- time display of the radio consoles, console audio recorder, radio network management tools, radio network alarm system, and microwave alarm system at each radio dispatch location.

Comply

A. The time generator must provide standard NTP server protocol via ethernet for use on the local and wide area network only.

Comply

B. Additionally, this time generator must include at least one additional ethernet port for providing an NTP source to an outside network that would not have access to the proposed radio network.

Comply

*Attach Master Time Source Documentation

Comply. See **Attachment 32 – 3.21.11 Master Time Source Documentation.**

3.21.12 Telecommunicator Headsets

3.21.12.1 Each position shall be capable of utilizing a wireless headset hardware for connectivity into the proposed radio console headset jack hardware.

Comply

3.21.12.2 The following headsets are currently in use by the Customer and should operate with the new dispatch consoles: Poly CA22CD-SC

Comply

*Attach Telecommunicator Headset Documentation

Comply. See **Attachment 33 – 3.21.12 Telecommunicator Headset Documentation.**

3.21.13 Digital Fixed Station Interface

3.21.13.1 The console system shall be capable of modern digital fixed-station interface (DFSI) connectivity to base stations and other fixed radios.

Comply

3.22 Fallback Control Stations

3.22.1 Each dispatch and supervisory position shall be equipped with a P25 trunked control station to permit radio dispatch operations to continue in the event of radio console equipment or connectivity failures.

Comply

Control stations are an important resource of the Dispatch Console System. In the event that consoles lose wireline connection to the radio system, backup control stations provide dispatchers a means to continue to communicate on the system. This ability relies on the consoles sharing the same local area network with the control stations and the conventional site controller (CSC). The control stations, together with the conventional site controller and conventional channel gateways, make up the backup control station subsystem.

*Attach Fallback Control Station documentation for this section

Comply. See **Attachment 34 – 3.22.1 Fallback Control Station Documentation.**

3.22.2 These control stations, in addition to the minimum requirements specified by the Control Station Specifications section of this RFP, must contain an alphanumeric display to provide information on talk-group selection and emergency call alerts.

Comply

3.22.3 Each control station shall be operated either by a stand-alone footswitch and headset jack or be integrated to the console and operate with the console footswitch and headset jack.

Comply

3.23 Training

3.23.1 A comprehensive training program must be established by the Vendor in its Technical Submittal, to be implemented if selected as the Contractor.

Comply

3.23.1.1 This program would include not only familiarize telecommunicators with physical features and functions of assigned Dispatch Console equipment, but also instruction pertinent to the System’s talkgroup structure and how the System’s infrastructure establishes local, wide-area and outside interoperable call transactions.

Comply

*Attach Telecommunicators Training Documentation

Comply. See **Attachment 58 – 3.42.9.4.A Training Description.**

3.23.2 The Contractor’s training program must include the necessary graphics, visual simulations, and printed media tools to establish an appropriate training process for users.

Comply

3.23.3 Training videos must be available to users on a private web-based portal, thereby allowing for individual refresher training.

Comply

3.23.4 The Contractor must also supply technical assistance during the initial warranty period that allows for ongoing modifications to these training resources, to keep them in-step with additions and changes to the operable and interoperable resources within the System.

Comply

3.23.5 The Vendor shall provide a detailed description of its proposed user/infrastructure training program for fallback control stations/portable radios. Examples of training tools developed for similar P25 regional trunked and conventional radio configurations shall be provided within the Vendor's Technical Proposal Submittal.

Comply

*Attach Fallback Training Documentation

Comply. See **Attachment 58 – 3.42.9.4.A Training Description.**

3.23.6 The Customer must approve all training curriculum prior to training.

Comply

3.23.7 The Vendor shall propose training for up to 38 telecommunicators and 4 telecommunicator supervisors.

Comply

3.23.8 The Vendor must provide resumes of professional training staff that will train the telecommunicators on how the Dispatch Console and Fallback radios operate on the proposed system.

Comply

*Attach Trainer Resume Documentation

Comply. See **Attachment 59 – 3.42.9.6 Training Staff Resumes.**

3.24 Logging Recorder Specifications

3.24.1 The vendor shall provide a new P25 capable and compatible Logging Recorder to provide capability for recording any talkgroup on the System and other capabilities as listed.

Comply

3.24.2 Comments:

3.24.2.1 The recorder shall include:

A. Capability to record from a standard NG911 Capable Call Handling solution, via IP recording, following the NENA i3 standard. (NENA-STA-010.3b-2021)

Comply

B. At least twenty-four (24) channel analog recorder inputs for telephone lines, and other analog audio sources. At least twenty-four (24) channel VOIP recorder inputs for telephone lines.

Comply

C. Screen Capture, Meta Data, & Quality Assurance Capabilities

Comply

D. Capable of being re-keyed via Over The Air Re-Keying (OTAR).

Comply with Clarification

Motorola meets the intent of this specification. OTAR is an over-the-air protocol used for radio subscribers. The various logging recorders on the market do not directly decrypt audio or handle encryption keys. We have included OTEK (Over Ethernet Keying) to the AIS (Archival Interface Server) that supports the Eventide Logging Recorder.

*Attach Logging Recorder Documentation

Comply. See **Attachment 38 – 3.24.2.1 Logging Recorder Documentation.**

3.24.3 The vendor shall include any cost for hardware, software, and services to integrate the proposed system to the existing logging recorder.

Comply

3.24.3.1 There is no existing logging recorder.

Understood

3.25 Dispatch Console Positions Features and Functions

3.25.1 Vendor shall replace all existing radio dispatch consoles at the Customer's dispatch center(s) with an IP-based solution and have seamless integration with the newly proposed system radio network.

Comply

3.25.2 Each of the radio dispatch consoles shall include all controls that apply to the various channel/talk- groups and auxiliary functions for the console.

Comply

The AXS dispatch console radio resource includes all typical controls for channel/talkgroup operation including but not limited to instant transmit, volume control, frequency select, encryption select, channel marker, wild card, etc. In addition, the AXS console provides a call stack with IRR for audio from that channel within the resource window.

3.25.3 Each console position shall contain as a minimum:

*Attach Dispatch Console supporting documentation for this section.

Comply

Please refer to **Attachment 39 – 3.25.3 Dispatch Console Supporting Documentation.**

3.25.3.1 Select Speaker – for audio from selected channels/talk-groups, with volume control.

Comply

3.25.3.2 Unselect speaker – for audio from unselected channels/talk-groups, with volume control.

Comply

3.25.3.3 Resource selectable speaker – Minimum of 1 additional speaker which allow for console audio resources to be dynamically assigned by the operator.

Comply

3.25.3.4 Transmit Function – a color-coded transmit function to control the push to talk (PTT) function for the selected transmitter(s) and/or talk-group(s).

Comply

3.25.3.5 All controls that apply to the various channel/talk-groups and auxiliary functions for the console.

Comply

3.25.3.6 CTCSS Monitor or Disable Function – shall disable the receiver CTCSS decoder of selected conventional base station(s) operating on conventional channels for monitoring purposes.

Comply

3.25.3.7 Clock – shall display time in twenty four-hour formats and shall be synchronized with the time server.

Comply

3.25.3.8 VU Meter or Audio Level Display.

Comply

3.25.3.9 Keypad or screen representation of a keypad for numeric data entry.

Comply

3.25.3.10 Microphone – desktop microphone type.

Comply

A. This microphone shall be resistant to interference, such as transmitting hum from lights, cathode ray monitors, or other devices used in the proximity of the console.

Comply

3.25.3.11 Dual Headset Jack – a dual headset jack shall be provided which will allow for use of a headset equipped with RJ-327 type plug with modular adapter.

Comply

A. Separate headset volume controls for radio and telephone audio output shall be provided.

Comply

3.25.3.12 Intercom – intercom between operator positions shall be provided.

Comply

A. A visual display shall be provided to identify both the calling and called parties by console name.

Comply

B. Multiple simultaneous intercom conversations between individual consoles shall be possible.

Comply

3.25.3.13 ID Display on the channel window for standard calls and emergency calls with a minimum of eight alphanumeric characters.

Comply

3.25.3.14 All Receiver Mute Function – a function, which will mute the received audio from all unselected channels, shall be provided.

Comply

A. This muting function shall be programmable in predetermined increments.

Comply

3.25.3.15 Simultaneous Select and Instant Transmit Function – controls shall be provided that allows the operator to manually select any combination of console controlled base stations for simultaneous transmissions.

Exceeds

Motorola Solutions exceeds this requirement. Up to 16 different Simultaneous Select (MSEL and Patch) groups per console can be configured.

A. Three selectable combinations shall be allowed at the discretion of the telecommunicator.

Comply

B. The patch shall utilize a single trunked channel when patching more than one talk group.

Comply

C. The Vendor will describe how the system will communicate from different type talkgroups or resources integrated to base station gateways.

Comply

1. P25 - P25 Talkgroup

Comply

2. P25 Encrypted Talkgroup - P25 Talkgroup

Comply

3. P25 Encrypted Talkgroup Key 1 - P25 Encrypted Talkgroup Key 2

Comply

4. Conventional - P25 Talkgroup

Comply

5. Conventional - P25 Encrypted Talkgroup

Comply

6. Base State Gateway P25 Talkgroup - P25 Talkgroup

Comply

7. Base Station GW P25 Encrypted Talkgroup - P25 Encrypted Talkgroup

Comply

3.25.3.16 Emergency/ Reset

Comply

A. Consoles shall receive emergency alerts from the trunked radio system regardless of the status of the channel control window.

Comply

B. Emergency messages shall be indicated by a flashing ID, emergency ID character and an audible alert.

Comply

C. Telecommunicator acknowledgment of the message shall silence the audible alert and stop the flashing display.

Comply

D. Multiple emergency messages shall be queued in the display stack and the emergency ID character shall continue to flash until all messages have been viewed and subsequently cleared by the telecommunicator.

Comply

3.25.3.17 Alert Tones

Comply

A. The console shall be provided with, at a minimum, three distinct tones used for alerting purposes over the air.

Exceeds

Motorola Solutions exceeds this requirement. The CommandCentral AXS dispatch console will operate with 15 distinct alert tones. Fifteen default .wav files are provided with the dispatch position software, but any combination of these default files may be replaced with customized .wav files to meet the City's specific needs.

1. Each alert tone shall be immediately broadcast, when activated, on the selected radio channel.

Comply

2. Alert 1 – Steady Alert Tone – shall generate a nominal 1000 Hz steady tone.

Comply

3. Alert 2 – Warbling Tone – shall generate a warbling tone.

Comply

4. Alert 3 – Pulsed Alert Tone – shall initiate an automatic sequence, consisting of a nominal 1000 Hz tone, for a period of two (2) seconds.

Comply

3.25.3.18 Paging Encoders – Each console shall include a multi-tone paging/signaling encoder that is accessible, minimally, through the data entry keyboard.

Comply

3.25.3.19 Call Indication – a color-coded status call indicator shall be provided for each receiver in a channel control window on the display screen.

Comply

3.25.3.20 Individual Volume Adjust – shall be provided for each channel on the console. Associated color-coded status indicators shall continuously show whether the channel is in the full or adjustable volume control shall be automatically bypassed when a channel is placed in select status.

Comply

3.25.3.21 Talk-group/Channel Cross Patch

Comply

3.25.3.22 Channel/Group Name – designated channel/group control modules shall include a minimum of eight-character alphanumeric display symbols to identify the channel/group.

Comply

3.25.3.23 Talk-Group/Channel Busy Indication

Comply

3.25.3.24 NENA interface – Connectivity to existing E911 and future NG911/IP telephony system (provided by others) for single headset operation.

Comply

3.26 General Equipment and Shelter Requirements

3.26.1 Shelter Design Considerations

*Attach Shelter Design Documentation

Comply. See **Attachment 40 – 3.26.1 Shelter Design Documentation.**

3.26.1.1 Equipment shelters shall be of a concrete floor, bullet-resistant, concrete aggregate type designed to house radio communications, the standby power generator/transfer switch, and sensitive electronic equipment:

Comply

A. The exterior wall measurements shall be no less than 10ft high, 12ft wide and 30ft long. Interior dimensions shall include nominal wall, roof and floor dimensions, to be determined by Contractor.

Comply

B. Equipment shelters must provide an interior climate suitable for the operation of sensitive electronic equipment, that is, it must be dust proof, watertight and airtight.

Comply

1) Airtightness shall be measured by a door fan test equivalent to that used to pass a dry agent fire suppression pressure test of 10 minutes at 8 feet.

Comply

C. The shelter shall include a separate power generator equipment area that includes a separate access doorway and a fire-barrier separator that isolates the generator area from the HVAC-conditioned radio equipment space.

Comply

D. This generator equipment area shall also be equipped with a ceiling mounted, thermostatically controlled, electrical heater.

Comply

E. Each equipment shelter shall be supported by a reinforced concrete pad with attachment devices appropriate for securing the building assembly to survive hurricane or straight-line type force (no less than 150-mph) winds.

Comply

1. Construction detail for pad and attachment must be stamped by a licensed engineer.

Comply

F. Any sites located within a FEMA 100-Year Floodplain shall require elevation due to the increased flood risk. These equipment shelters shall be elevated upon approved concrete piers or galvanized steel framework. Failure to identify sites that meet this requirement does not excuse the Contractor from meeting the requirement and all work shall be performed at the Contactor’s cost.

Comply

*Attach FEMA Floodplain documentation for this section.

Comply. See **Attachment 41 – 3.26.1.1.F & 3.26.1.1.F.2 FEMA Floodplain Documentation.**

1. The finished length of piers/framework shall extend, minimally, four feet above ground level but otherwise in accordance with FEMA’s 100-Year floodplain elevation height plus a 24-inch contingency margin.

Comply

2. Any site located within a FEMA 500-Year Floodplain must be clearly identified by the vendor within the proposal.

Comply. The State of Florida and Utilities sites are in the 500-year Flood Hazard Zone.

*Attach list of proposed sites with indication of those in the FEMA floodplain.

Comply. See **Attachment 41 – 3.26.1.1.F & 3.26.1.1.F.2 FEMA Floodplain Documentation.**

G. Any metal components, attachment hardware, cross-braces and lifting eyes shall be hot-dip galvanized metal after fabrication.

Comply

3.27 Shelter Configuration Details

3.27.1 The exterior wall finish shall be exposed aggregate concrete. Seeding of aggregate for an exposed aggregate finish is not acceptable. Exterior walls must be bullet resistant as defined below.

Comply

3.27.1.1 The roof shall be a flat, tapered type having a minimum slope of 1/2" per foot from the roof centerline.

Comply

3.27.1.2 The roof shall be designed to support a minimum of 100-lbs/sq. ft. distributed load.

Comply

3.27.1.3 A roof shield shall be provided and installed by the Contractor, above the equipment shelter and of sufficient size to adequately protect the shelter and personnel from falling materials via the nearby radio site's tower.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Comply with Clarification

Motorola does not typically install roof shields in climates where ice is not a factor. However, Motorola can provide this at an additional cost if requested.

3.27.2 All exterior wall, floor and roof joints shall be sealed using a compressible, resilient sealant. There shall be no exposed roof-to-wall or wall-to-floor joints.

Comply

3.27.3 Cement used in concrete shelters shall be standard Portland cement conforming to the requirements of the "Standard Specification of Portland Cement", ASTM Designation C150. Concrete aggregate shall conform to the requirements of the "Specifications for Concrete Aggregates" ASTM C33 and "Specifications for lightweight aggregates for structural concrete" ASTM C330.

Comply

3.27.4 Exterior concrete surfaces shall be sealed with a minimum of two coats of THOROGLAZE® H Concrete Sealer or approved equal.

Comply

3.27.5 The shelter's interior floor shall be covered with poured epoxy. It shall be navy in color with red and white flecks

Comply

3.27.5.1 The subfloor shall be designed to support a minimum of 200 lbs. / sq. ft. distributed floor load, while on foundation, or as needed to support proposed equipment.

Comply

3.27.5.2 Consideration should be given to the area(s) for the proposed 48VDC battery plant weight load.

Understood

3.27.6 Walls shall have a minimum thermal insulation factor of R11.

Comply

3.27.7 The shelter's roof shall have a minimum thermal insulation factor of R19.

Comply

3.27.8 Interior wall surfaces shall be faced with white vinyl/coated wood paneling.

Comply

3.27.8.1 The interior ceiling surface shall be white, vinyl coated plywood. Seams in the plywood shall be trimmed with batten strips painted to match the ceiling.

Comply

3.27.9 Building openings for the door, air-conditioners, transmission line entrance and other entries shall be framed and sealed in such a manner that moisture, nor insects cannot penetrate the insulation within the walls or the interior walls of the structure.

Comply

3.27.10 Each door measuring 36"W x 84"H x 3" made of thick insulated bullet-resistant steel, and equipped with a three-point latch, shall be provided. All door hardware shall be stainless steel and incorporate three external hinges having non-removable hinge pins. Door shall open outward to maximize internal building utilization.

Comply

The door meets all requirements mentioned above, however the door is standard thickness.

3.27.10.1 The term 'bullet-resistant" is defined, for this RFP, as unable to be penetrated by a .30-06 or .308 commercial cartridge firing a lead tipped, 160-grain projectile, at no more than 2600 fps muzzle velocity. The projectile will be test-fired at a range of 100 yards. The structure/material must not be completely penetrated at that distance.

Comply

3.27.11 Aluminum exterior awnings shall be provided to protect the door entrance(s) and air-conditioner units.

Comply

3.27.12 All hardware used on the exterior surfaces of this shelter shall be either hot-dipped galvanized or stainless steel. Wafer, MDF (Medium-Density Fiberboard), or particleboard wood products are not an acceptable construction material for this project.

Comply

3.27.13 Contractor shall provide detailed fabrication drawings for the concrete foundation (or steel frameworks), designed to adequately support the proposed building structures and wind loads.

Comply

3.27.13.1 Additionally, the building frame shall be mechanically bonded to the concrete/steel foundation. Strapping and anchor materials shall be hot-dipped galvanized protected.

Comply

3.27.14 Building, and foundation detail drawings and related calculations must be reviewed, approved and stamped by a licensed Professional Engineer (P.E.), licensed in the State of construction.

Comply

3.28 Shelter Electrical Requirements

3.28.1 Each shelter shall be equipped with overhead cable trays located above all planned equipment rack groupings.

Comply

3.28.1.1 Auxiliary cable trays shall be provided to support transmission lines and telecommunications cables, as necessary.

Comply

3.28.1.2 All cable tray joints shall be electrically bonded using No. 6 AWG copper wire jumpers with approved compression fittings.

Comply

3.28.1.3 Trays shall be bonded to the interior ground halo.

Comply. Motorola will be 100% compliant with R56 and local standards.

3.28.2 Individual, properly grounded with home run grounds, 120VAC, 20A electrical circuits shall be provided to each of the equipment racks/cabinets.

Comply

The number of overhead electrical circuits is not specified. MSI has included a total of twelve (12) 20AMP twist lock receptacles as noted in Section 3.28.9.

3.28.3 Each shall be terminated as a single, duplex outlet mounted on the cable tray directly above the center of each planned equipment rack.

Comply

The twist lock receptacles will be ceiling mounted over the equipment rack locations.

3.28.4 Individual, properly grounded with home run grounds, 240VAC, 30A electrical circuits shall be provided for each battery charger unit.

Comply

3.28.5 Sufficient flexible conduit shall be provided above the rack to permit interconnection to chargers located at the bottom of the rack.

Comply

3.28.6 DC wiring for the radio network's battery plant and interconnection to the various equipment groupings shall be furnished and installed, as required.

Comply

3.28.7 Install eight (8), properly grounded with home run grounds, quad 120VAC convenience outlets, two each on the two longest walls and one each on each of the remaining walls.

Comply

3.28.8 Install four (4), properly grounded with home run grounds, quad 120VAC convenience outlets shall be installed within the generator space.

Comply

3.28.9 No fewer than twelve (12) 120VAC ceiling mounted outlet boxes shall be provided, each with one (1) duplex receptacle and home run ground. These receptacles should be spaced according to areas of located 120VAC equipment or future expansion space areas.

Comply

3.28.10 The Contractor shall furnish and install no fewer than one circuit breaker panel board. Panel board shall be sized for all the indicated branch circuits, equipment loads plus a fifty (50%) growth factor.

Comply

3.29 Electrical/Transient Grounding System

3.29.1 The Contractor shall furnish and install an interior and buried exterior electrical grounding system and power surge protection for each location, as follows:

Comply

3.29.1.1 A single #2AWG copper conductor ground halo shall be installed on all four interior walls, spaced approximately six inches below ceiling level.

Comply

3.29.1.2 The halo shall include a twelve-inch gap/break at the furthest point from the single-point ground attachment, which shall coincide with the RF transmission line entrance.

Comply

3.29.1.3 Ground halo shall be mounted on six-inch standoffs, located on twelve-inch centers. It shall be affixed to the transmission line ground entry-port buss bar.

Comply

MSI will mount the ground halo on four-inch standoffs in accordance with R56 specifications.

3.29.1.4 This ground entry-port buss bar must be equipped with an Alarm, connected to the network's alarming system, to indicate ground failure, tamper, or theft.

Comply

3.29.1.5 All equipment cabinets, racks, transmission line entrance and cable trays shall be individually bonded to the halo using #6AWG copper conductors with approved compression fittings.

Comply

3.29.1.6 Interior halo shall be bonded to an exterior, buried ground network using low impedance copper conductors.

Comply

3.29.1.7 Electrical transient protectors shall utilize MOV and avalanche clamp devices such as the Transector Systems Model 1101-808 series or equivalent. This device shall be installed on the commercial power feed as well as the standby generator feed to the power transfer switch.

Comply

3.29.1.8 A single, stranded #00AWG copper exterior ground system shall be installed about the building and tower perimeter, located below the frost line, as identified locally, and exothermically bonded to the building frame, interior halo, transmission line ladder, generator system, ice shields, and radio tower legs.

Comply

3.29.1.9 All site grounding practices and methods shall meet a recognized telecommunications standard such as IEEE, Motorola R56 or the current revision of Harris AE/LZT 123 46181/1.

Comply

3.30 Shelter Lighting Requirements

3.30.1 Install LED light fixtures as necessary to provide effective illumination for each equipment rack, and within the generator room.

Comply

3.30.2 Install emergency exit and interior lighting as required by fire code.

Comply

3.30.3 Exterior lights above the door(s) and area lights on each of the exterior shelter corners shall be controlled by, at a maximum, two light switches located just inside the main door opening on the side away from the hinges at shoulder height.

Comply

3.30.4 LED lights are permitted on exterior walls with prior approval by the Customer.

Understood

3.30.4.1 LED lights should be tested to limit interference with system operation. Lighting that causes interference shall be replaced at the expense of the Vendor

Comply

3.31 HVAC Requirements

3.31.1 The Contractor shall furnish and install a redundant heating and air conditioning system appropriately sized to maintain an average temperature of 70 degrees Fahrenheit and less than 60% relative humidity. Redundancy shall mean that the failure of one air conditioner shall not cause the room temperature to exceed 80 degrees F and/or 75% relative humidity.

Comply

3.31.2 The HVAC system, due to shelter hardening, should consist of split unit compressors and air handlers to minimize wall penetrations. The air handler units shall include a condensation collection and removal system with an alarm for high water level/pump failure. The alarm will be wired and configured for access by a remote network management client.

Comply

3.31.3 Vendors are permitted to submit alternative or cost savings options in addition to the HVAC requirements listed in Section 3.31.

Understood

3.31.4 For heat load calculations, Contractor shall include all continuous duty equipment and assume all transmitters will be operating at a 50% duty cycle. Heat load shall also include a building loss factor appropriate for the location’s historical high temperature average (previous 5 years) and the shelter's overall insulation rating. Heat from future growth equipment shall also be included in the initial load. Heat from interior lighting and service outlets may be excluded.

Comply

3.31.5 The HVAC system shall provide the heating capacity necessary to maintain a room temperature of 60 degrees Fahrenheit with all equipment powered off. Heating capacity shall be based on the shelter’s overall insulation rating and an outdoor temperature from the location’s historical low temperature average for the previous 5 years.

Comply

3.31.6 HVAC configuration must include a lead-lag controller to rotate use of the air conditioner units. The lead unit shall be rotated after each cycle. The controller shall support the number of HVAC units proposed, including any secondary stages, plus 1 additional similar unit for future expansion and redundancy. The controller shall support industry standard wiring used by the leading manufacturers.

Comply

3.31.7 The HVAC Controller should include the following sensors and alarms:

3.31.7.1 Indoor Temperature Sensor

Comply

3.31.7.2 Outdoor Temperature Sensor

Comply3.31.7.3 Indoor Humidity Sensor

Comply

3.31.7.4 Fire Suppression System Shutdown Input

Comply3.31.7.5 Ethernet Connectivity for Remote Management (wired and configured for remote access)

Comply

3.31.7.6 NO/NC Dry Contact Outputs (wired and configured for remote access)

Comply

A. Controller Primary Power Fail

Comply

B. Generator Active

Comply

C. Controller Failure

Comply

D. Unit Lock Out (ea.)

Comply

E. Emergency Shutoff High Temperature (ea. sensor)

Comply

F. Low Temperature

Comply

G. High Humidity

Comply

H. Filter Alarm

Comply

I. Emergency Ventilation Fan

Comply

J. Theft Alarm

Comply

3.31.8 Each AC unit shall incorporate circuitry to ensure that multiple compressors do not attempt to restart at the same time.

Comply

3.31.9 The HVAC configuration shall include appropriate sensors to cause multiple air conditioners to run simultaneously, as needed, to reduce the internal temperature more rapidly to a safe operating level.

Comply

3.31.10 Equipment shall be furnished with compressor anti-cycle circuitry to prevent short-cycle starts against high compressor head pressure.

Comply

3.31.11 Equipment shall be furnished with a compressor hot gas bypass (or its equivalent) to minimize electrical power surges because of compressor cycling.

Comply

3.31.12 The design of HVAC system shall take into consideration local environmental conditions and include appropriate coatings where units are exposed to salty air.

Comply

3.31.13 Buildings shall incorporate a thermostatically controlled Emergency Ventilation System (EVS) designed to operate in the event of a total HVAC failure and where the building’s interior temperature exceeds 90°F.

Comply

3.31.13.1 The EVS shall be capable of remote activation and deactivation.

Comply

3.31.13.2 When installed in a room with an automatic fire suppression system, the EVS will include circuitry to close all dampers and disable the fan.

Comply

3.31.14 The EVS shall incorporate appropriate motorized dampers, screens, and filters to limit dust and insect entry into the building.

Comply

3.31.15 A second EVS shall be installed within the generator room (for indoor generators).

Comply

3.31.16 Customer requires separate compressors and Air Handler Units (AHU).

Comply

3.31.16.1 Compressors shall be mounted on the platform with shelter.

Comply

3.31.16.2 AHU's can be ceiling mounted or floor mounted, with alarmed external condensation tray.

Comply

3.32 Shelter Alarm Systems

3.32.1 The Contractor shall furnish and install an over/under temperature sensor, continuously adjustable over the range of 40°F to 90°F, having independent Form-C output contacts suitable for high/ low temperature alarm activation.

Comply

3.32.2 The Contractor shall furnish and install a door entry alarm sensor, magnetic type, having a Form-C contact closure output.

Comply

3.32.3 The Contractor shall furnish and install single-loop smoke/ fire detection system with relay alarms output to the site alarm block independent of any alarms that may be provided by an engineered fire suppression system.

Comply

3.32.4 Smoke/fire alarm sensors shall be mounted above battery charger equipment, in the generator room, and in vicinity of AC power distribution panel board.

Comply

3.32.4.1 Smoke/fire alarm panel shall have visual indicators depicting individual alarm sensor status.

Comply

3.32.4.2 Smoke/fire alarm panel shall operate from both 120VAC and 12VDC battery power sources.

Comply

3.32.4.3 The Customer's Fire Marshal shall inspect the proposed fire alarm system.

Comply

3.32.5 All shelters shall be equipped with an inert gas fire suppression system that is environmentally approved and not injurious to communications personnel.

Comply

3.32.5.1 The system shall be connected to the shelter fire/smoke system alarms.

Comply

3.32.5.2 Trigger of the system causing a gas discharge shall cause the air conditioners and fans to automatically shut off.

Comply

3.32.6 Where the HVAC equipment is disabled by the Fire Suppression system, a method for remote restarting of the HVAC shall be provided.

Comply

3.33 Generator Requirements

3.33.1 LPG Generator Equipment Requirements

3.33.1.1 A standby dual-fuel power generator system shall be furnished by the Contractor for each infrastructure site. For its proposed infrastructure sites, the Vendor shall include:

Comply with Clarification

Motorola Solutions will conduct a load study for all four proposed Infrastructure sites, but proposes to continue using the existing generator at the Utilities site if it has sufficient capacity to continue powering that site. As confirmed by the City of Fort Lauderdale, the two condo buildings do not currently have a backup generator serving the intended equipment rooms. Due to the complexities of installing a generator at a condo building (e.g., building rules, HOA regulations, and city ordinances), Motorola Solutions has included an allowance to address this requirement to potentially provide backup generators at both the condo sites.

If the actual generator costs exceed the allowance, Motorola Solutions will work with the City of Fort Lauderdale for approvals and invoicing. If the actual generator costs are less than the stated allowance, Motorola Solutions will provide a Technology Credit to the City of Fort Lauderdale.

A. The necessary labor and materials, as required, to furnish and install LPG fuel tanks, automatic transfer switches, manual-operated auxiliary generator connector facilities, alarm functionality and electrical wiring services to provide fully operational standby power systems.

Comply

B. A generator housed inside the provided equipment shelter, in accordance with the manufacturer's specifications for shock and vibration mounting, ventilation, fuel supply and electrical connections.

Comply

C. The radiator air inlet shall incorporate a baffle to protect the radiator core from exterior wind-blown debris damage.

Comply

D. It shall be the responsibility of the Contractor to provide, install and test a complete and operable standby power generator with automatic transfer switch.

Comply

E. Equipment shall be new, factory tested at 0.8 power factor for 3-hours and shall be installed within the required equipment shelters, in accordance with local area building and electrical codes.

Comply

F. The following documentation shall be supplied by the Contractor for the generator set and transfer switch supplied:

1. Specification and data sheets for the exact type and model generator and transfer switch supplied pursuant to this procurement, including all options and accessories included.

Comply

2. Manufacturer's certification of prototype testing.

Comply

3. Manufacturer's warranty documents.

Comply

4. Shop drawings showing plan and elevation views of the equipment.

Comply

5. Interconnection wiring diagrams showing all external connections required; with field wiring terminals marked in a consistent point-to-point manner.

Comply

6. Manufacturer's installation instructions.

Comply

7. Operator's and maintenance manuals that outline routine maintenance and troubleshooting procedures.

Comply

8. Transfer switch manual and wiring diagram.

Comply

G. Start-Up Service shall be included with the following requirements:

1. A factory authorized service representative shall provide initial start-up service and shall conduct on-site acceptance testing.

Comply

2. The representative must remain until site acceptance is completed, as witnessed by the Customer.

Comply

3. Load test records for the installed generator system shall be furnished to The Customer.

Comply

H. The following type of engine configuration will be used:

1. The generator package shall include an LPG configured engine coupled with low reactance, brushless 120/240vac single-phase, 60Hz generator.

Comply

I. The generator package shall be equipped with:

1. A temperature compensated automatic voltage regulator;

Comply

2. Under/over-speed protection function;

Comply

3. A control panel;

Comply

4. Engine block heater;

Comply

5. High ambient-temperature cooling system.

Comply

J. Output power rating of the generator shall be sized for the full calculated load of the affiliated site, inclusive of a 50% excess load factor.

Comply

K. In no instance shall the proposed generator be configured for less than 45KW output.

Comply

L. The generator shall also be capable of continuous 24-hour operation, full single- phase output at 1.0 pf.

Comply

M. The following specifications shall also apply:

1. Voltage Regulation: Maintained with +/- 2% of rated voltage for constant load between no load and full load.

Comply

2. Frequency Regulation: Maintained within 0.5% from steady state no load to steady state rated load.

Comply

3. Single-Step Load Pickup: 100% of rated output power, less applicable derating factors, with the engine generator at operating temperature.

Comply

N. The generator shall have the following Set Controls:

1. The generator shall be a remote-start type compatible with the automatic transfer switch to be supplied pursuant to this procurement.

Comply

2. Manual starting and stopping shall be provided from the control panel.

Comply

3. Cranking control: Shall provide a minimum of three cranking cycles of at least 15-seconds before lockout and activation of an over-crank alarm condition.

Comply

4. The generator shall automatically shut down and lock out upon:

a. Failure to start (over-crank)

Comply

b. Over speed

Comply

c. Low lubricating oil pressure

Comply

d. High engine temperature

Comply

e. Low Coolant level

Comply

f. Other factors that may be harmful to the generator

Comply

5. Alarm contacts shall be provided to allow transmission of fault alarms for any of the above conditions, plus low oil pressure pre-warning, high coolant temperature pre-warning, low coolant temperature, low fuel and an alarm indication when the generator set is running.

Comply

a. These alarm contacts shall be wired into, and shall be reported by, the radio network alarm system.

Comply

6. Meters shall be provided and located both at the generator and within the equipment shelter, to indicate output voltage, output current, running time, and frequency/RPM.

Comply

7. An AC rheostat (or electronic equivalent) shall be supplied for fine tuning of the generator's output voltage.

Comply

8. These devices shall be mounted either on the transfer switch door or a separate, remote panel.

Comply

9. Each generator must have the capability to communicate to a central control software terminal, via the IP network, to allow for remote start and other diagnostic capabilities.

Comply

10. Each LPG-Generator shall have the following Fuel Supply requirements:

Comply

a. The Contractor shall supply a new, corrosion-proof, 1,000-gallon LPG storage tank to be installed on a concrete or elevated steel foundation, as dependent upon site flood plain conditions.

Comply

b. The fuel tank shall provide sufficient fuel to provide ninety-six (96) hours of continuous operation of the generator set at full load under low ambient temperature.

Comply

c. The fuel tank shall have a shield installed above to prevent debris from the nearby tower puncturing or damaging the tank shell.

Comply

d. The tank shall be refilled after the conclusion of radio network acceptance tests.

Comply

e. Fuel lines shall be buried below the frost line, as determined by the location. At any point at which the fuel line exits above grade, the line shall be insulated to reduce condensation at the regulator.

Comply

f. A low fuel level alarm shall be provided.

Comply

g. All fuel supply lines will be sized accordingly for the generator running at full load.

Comply

h. All necessary regulators, drip pots, piping, meters, or other supplies needed for installation that meets local fire and building codes shall be furnished and installed.

Comply

i. Contractor shall supply a full fuel tank at time of System Acceptance.

Comply

j. Generator shall be capable of being connected to a natural gas line with constant supply of natural gas rather than the supplied tank with the option to switch to the LPG tank if the natural gas supply is interrupted.

Comply

11. A residential-grade exhaust silencer shall be installed on the generator.

Comply

12. Battery and Charger specifications are as follows:

a. A lead acid starting battery, rated for the engine type to be supplied, shall be furnished and installed with the generator package.

Comply

b. This battery shall be float charged by a 10-ampere, voltage-regulated charger which is powered by a protected 120VAC source.

Comply

c. Float, taper and equalize charge settings shall be provided.

Comply

d. Battery charger shall be physically located within the generator transfer switch enclosure.

Comply

e. Battery and charger must be able to operate in, as low as, 0 degrees F.

Comply

f. Form-C charging system alarm contacts shall be provided and connected to the network's alarm system to report loss of AC power, low battery voltage and excessively high battery charging current.

Comply

13. The following Cooling System components are required:

a. A radiator-cooled engine is required.

Comply

b. The radiator shall be filled with a water/coolant mixture in accordance with the engine manufacturer's recommendations.

Comply

c. A thermostatically-controlled water jacket coolant heater shall be provided and installed in accordance with the manufacturer's recommendations.

Comply

14. The Generator Base shall have the following characteristics:

a. The generator set shall be mounted on a heavy-duty steel base which is anchored to a Contractor-furnished building foundation.

Comply

b. The base shall maintain alignment between generator set components and shall include vibration isolators.

Comply

3.33.1.2 Customer prefers a non-proprietary controller (e.g. Basler or approved equal).

Comply

3.33.1.3 Customer prefers GM 5.7-liter engine.

Comply

3.33.1.4 Customer requires baffling of the hot air exhaust

Comply

3.33.2 The Generator Transfer Switch

3.33.2.1 An automatic transfer switch which provides switching of the equipment shelter electrical load between commercial power and generator power shall be supplied and installed for each Vendor proposed standby generator.

Comply

A. Each transfer switch shall be completely factory assembled and shall contain electronic controls designed for surge voltage isolation, with voltage sensors on all phases of both input power sources.

Comply

B. Permanently attached manual handles shall also be installed on the transfer switch.

Comply

C. The switch shall provide positive mechanical and electrical interlocking, and mechanically-held contacts.

Comply

D. Quick-make and quick-break contact mechanisms shall be provided for manual transfer under load.

Comply

E. Each transfer switch shall be installed in a key locking, UL listed, NEMA rack to be mounted on a wall within the radio equipment shelter.

Comply

F. The switch shall be fully wired and integrated with the engine generator set in accordance with local electrical and fire codes.

Comply

G. A manually-operated transfer switch, as well as appropriate power connectorization, shall be provided to allow the interconnection of an auxiliary, trailered generator set should the permanently-located generator fail in operation, utilizing an Appleton plug. Vendor shall include terminals for auto start contact closure for the temporary generator solution.

Comply

H. All transfer switches and accessories shall be U.L. listed and labeled, tested per U.L. Standard 1008 and CSA Approved.

Comply

I. Transfer switches shall be double-throw electrically and mechanically interlocked and mechanically-held in both positions.

Comply

J. Main switch contacts shall be high-pressure silver alloy.

Comply

K. Contact assemblies shall have arc chutes for positive arc extinguishment. Arc chutes shall have insulating covers to prevent inter phase flashover.

Comply

L. Form-C contacts shall be provided in each main switch position for alarm reporting purposes.

Comply

M. These contacts shall be connected to the network's alarm system for reporting transfer status.

Comply

N. Each transfer switch shall be continuously rated for operation in ambient temperature ranges of -40 to +50 degrees Celsius.

Comply

O. Transfer switches shall be rated, minimally, to carry the generator's full rated output, inclusive of the 50% added capacity over calculated equipment loading.

Comply

P. The Line-In, Generator-In and Load side terminations for the automatic transfer switch shall be protected from lightning transients using a combination of Metal Oxide Varistor (MOV) and avalanche Zener diode technologies.

Comply

Q. All alarm and instrumentation wiring from the generator, that enters the equipment shelter, must likewise include appropriate lightning surge protection in the form of solid-state, fast-acting voltage clamp devices whose clamping voltage is closely matched to normal individual-alarm signal amplitudes.

Comply

R. Transfer switch control shall be solid state and designed for a high level of immunity to power line surges and transients.

Comply

S. The device shall be tested in accordance with IEEE Standard 587-1980 (or latest revision).

Comply

T. Controls shall have optically isolated logic inputs, and isolation transformers for AC inputs.

Comply

U. Relays shall be installed on all outputs.

Comply

V. Solid state under voltage sensors shall simultaneously monitor all phases of the standby power source and the commercial power source.

Comply

W. Pick up and drop out voltage settings shall be adjustable.

Comply

X. Voltage sensors shall allow for adjustment to sense partial loss of voltage on any phase.

Comply

Y. Controls shall be provided with solid state over voltage sensors, adjustable from 100-130% of nominal input voltage to monitor the source.

Comply

Z. An adjustable time delay shall be provided.

Comply

AA. Automatic controls shall signal the engine generator to start upon signal from normal source sensors.

Comply

BB. A time delay start, variable from 0 to 5 seconds, shall be provided to avoid nuisance startups.

Comply

CC. Battery voltage starting contacts shall be gold, dry type contacts which have been factory wired to a field wiring terminal block.

Comply

DD. The switch shall transfer when the emergency source reaches the set point voltage and frequency.

Comply

EE. A time delay shall be provided for transfer that shall be continuously variable from 0 to 120 seconds.

Comply

FF. The switch shall retransfer the load to commercial power after a delay.

Comply

GG. This time delay shall be variable (adjustable) from 0 to 30 minutes to avoid short engine run times.

Comply

HH. The retransfer time delay shall be immediately bypassed if the emergency generator fails.

Comply

II. A control shall automatically signal the engine generator to stop after a time delay, which shall be adjustable from 0 to 10 minutes, the time starting upon return to commercial power.

Comply

JJ. Power for transfer operation shall be from the source to which the load is being transferred.

Comply

KK. Diagnostic indicators shall be provided to allow the last successful step in the sequence of control functions to be pinpointed.

Comply

LL. The present status of the control functions shall also be indicated.

Comply

MM. These functions, at a minimum, shall include:

1. Source 1 OK

Comply

2. Start generator set

Comply

3. Source 2 OK.

Comply

4. Transfer timing

Comply

5. Transfer complete

Comply

6. Retransfer timing

Comply

7. Retransfer complete

Comply

8. Timing for stop

Comply

NN. A key-operated Front Panel selector switch shall be provided which will provide the following functions:

Comply

1. Test to simulate commercial power loss to allow testing of the generator set with or without transfer of the load.

Comply

2. Normal - leaves the transfer switch in its normal operating position.

Comply

3. Retransfer a momentary position which will provide an override of the retransfer time delay and cause immediate return to the commercial power source (if available).

Comply

OO. An Exerciser Clock setting shall be included which allows setting the day, time and duration of a generator set exercise/test period. Tests under load or with no load shall be selectable.

Comply

3.34 Tower Requirements

3.34.1

All vendors shall comply with the Customer tower ordinances and local codes in addition to the requirements listed in this RFP.

Comply

There are no new self-support or guyed towers provided in this proposal except for the proposed 80 ft monopole tower at the Backup Dispatch location. Motorola understands the requirements, but this section of the RFP is not applicable to Motorola's design.

3.34.2 Basic Design

3.34.2.1 The basic standard for the design of newly required steel antenna towers, wave guide bridges and supporting structures, shall be ANSI/TIA-222-H.

Comply

3.34.2.2 Towers shall be triangular shaped, solid-rod structure having an overall height to be determined by the Vendor, based on the requirements of area coverage and availability of unobstructed microwave paths for site connectivity.

Comply

A. Limits of available space in certain areas may dictate the use of self-supported towers.

Comply3.34.2.3 Each tower shall be designed for a minimum sustained 150-mph wind speed with the full complement of necessary antennas and required lights and other Federally-required equipment.

Comply

3.34.2.4 Antenna loads shall be as determined by Vendor; however, the design shall include a minimum growth factor in the top 1/3 of the tower to support a future 6' high performance microwave dish and 2 antennas comparable to the vendors choice for the coverage design.

Comply

A. Vendors are encouraged to investigate local tower code information and respond accordingly.

Comply

B. All other loading requirements required by existing codes or lease agreements, shall be in addition to this growth requirement.

Comply

3.34.2.5 All fabricated tower assemblies and parts shall be hot-dipped galvanized after fabrication per ASTM Standard A123.

Comply

A. Hardware shall be galvanized per ASTM Standard A153 and B695. Other types of zinc coating or plating are not acceptable.

Comply

3.34.2.6 Towers shall be supplied with a full-length transmission line ladder(s) designed to accept transmission lines needed for the proposed design plus one extra 6GHz waveguide and two 1-5/8" coax runs for future growth.

Comply

A. Cable ladder future growth area shall be design for unstacked lines.

Comply

3.34.2.7 Towers shall be equipped with an outside climbing ladder/cable type safety devices and LED lighted in accordance with FAA and current OSHA regulation 29 CFR 1910.27.

Comply

A. This device shall not interfere with the ease of climbing from one rung of the ladder to the next.

Comply

B. There must be at least two sources of climbing safety belts compatible with the safety climb anti-fall system, as supplied with the tower.

Comply

3.34.2.8 Tower lighting shall conform to FAA Advisory Circular AC 70/7460-1M, or current revision, Obstruction Marking and Lighting. VHF, UHF and 800 MHz radio equipment may be operational/co-located at the various trunked radio sites.

Comply

A. Therefore, it is imperative that only shielded, RFI-conditioned lighting devices be provided.

Comply

3.34.2.9 The Vendor shall provide detailed tower lighting equipment specification literature in its response sufficient in scope where the Customer can determine the suitability of the proposed lighting system with respect to planned or anticipated radio operations.

Comply

3.34.2.10 The Contractor shall install tower lighting controls in a temporary fixture adjacent to the tower, operated by a photo control, and provide a Form-C contact wired into the alarm panel.

Comply

A. Note:

1. This controller device is to be relocated within the site equipment shelter once fully constructed.

Comply

2. Please allow sufficient lighting control cable slack to allow for re-installation inside the equipment shelter.

Comply

3.34.2.11 All antennas, tower top amplifier (TTA), and transmission lines specified by the licensed frequencies and Contractor's system design shall be furnished and installed by the Contractor.

Comply

3.34.2.12 A site's Electrical Grounding System shall be furnished and installed by the Contractor in accordance with the following minimum practices:

Comply

A. Install a ground ring around the base of the tower, consisting of 10'x 5/8" ground rods driven to a depth necessary to meet the required resistance measurement of the specifications, adjacent to the foundation of the tower at each leg.

Comply

B. Ground rods shall be interconnected by a minimum #00AWG stranded copper wire, which is to be exothermically welded to the top of each ground rod.

Comply

C. Maximum spacing between rods shall not exceed twice the length of the ground rod.

Comply

D. Each tower leg shall be bonded to the ground ring using #00 AWG stranded tinned copper cable, which has been exothermically welded to a flat, 4-inch square solid steel tab located near the base of each tower leg.

Comply

E. Each cable lead will run to the closest ground rod through an insulated sleeve to minimize wire damage.

Comply

F. The upper end of the sleeve should be sealed with a non-shrinking compound such as RTV to prevent water from collecting within the sleeve.

Comply

G. The Contractor shall avoid making any acute bends as the ground wire transitions from the foundation.

Comply

H. Bends should be a minimum of 9-inches in radius.

Comply

I. To complete the exothermic welding process, attachment area on the tower tab shall be cleaned and coated with a cold galvanizing compound.

Comply

J. The ground bar must be tamper and theft resistant. The wire lead must be sleeved so that it is protected from physical damage.

Comply

K. Like above, the upper end of the sleeve shall be sealed with a non-shrinking compound like RTV to prevent water from entering and collecting within the sleeve.

Comply

L. This ground wire lead shall be installed at the time the tower ground ring is installed.

Comply

M. The ground rod/ring system shall extend around the perimeter of the equipment shelter, transmission line copper entrance port into the shelter and to the perimeter fence.

Comply

N. Ground system ring around the tower base shall be located a minimum of 36 inches away from the tower foundation.

Comply

O. The tower ground system ring shall be connected to the equipment shelter ground ring in at least two places, on the closest corners of the shelter ring.

Comply

P. The Contractor shall electrically bond all transmission line outer shields to the structure at the top of the tower immediately below the antenna and at the line midpoint if the tower’s height is over 200-feet.

Comply

Q. Likewise, bond all transmission line shields near the bottom segment of the tower, approximately one-foot above the bend made to enter the waveguide-bridge and again at the shelter’s antenna entry port/panel.

Comply

R. Use only transmission line grounding kits approved by the manufacturer for use on the type and diameter of transmission lines provided. All installed grounding kits shall be weather sealed.

Comply

S. Fencing shall be grounded to the ground ring via #2 AWG solid copper wires, bonded via exothermic welding at each fence post.

Comply

T. Exothermic welds shall be cleaned and protected with a minimum two coats of cold galvanized material. Gates shall utilize braided, flexible straps.

Comply

U. The shelter's interior halo ground and transmission line copper inside entrance port (buss bar) shall exothermically bond to the outdoor ground.

Comply

V. A ground test well shall be provided at a minimum of two locations along the ground loop.

Comply

W. One test well shall be located adjacent to the tower and the other at the far side of the equipment shelter loop.

Comply

X. Each test well shall consist of a minimum 6-inch diameter PVC material that extends down to the depth of two feet and shall allow the attachment of a test wire to measure ground resistance.

Comply

Y. A screw on or drop on cover that is easily removable to allow testing shall be provided.

Comply

Z. Grounding system resistance shall be measured to be 3-ohms or less between any point on the ground system and earth ground.

Comply

AA. Measurement shall be done with a 4-point ground resistance tester and not by a clamp on resistance tester.

Comply

3.34.2.13 Vendors will supply a sample tower design for each type of proposed tower.

Comply

*Attach sample tower design documentation for this section.

Understood. We have no proposed towers in the design.

3.35 Guy Wires

3.35.1 Galvanized guy strand shall conform to the minimum requirements of ASTM Standard A475 Extra High Strength (EHS) or equivalent recognized standard.

Comply

The State of Florida is responsible for the design and implementation of the tower. For any new towers required by the State of Florida, Motorola will comply with guy wire requirements outlined in this section.

3.35.2 Preformed guy grips and dead-ends shall be designed specifically for the length, size and type of cable being used. This shall include the size, number, and lay of the wires and electrochemical compatibility of the material.

Comply

3.35.3 An adequate bend radius shall be provided, as per the manufacturer's recommendations, at the inside of cable attachments consisting of a thimble.

Comply

3.35.4 Shackles used to connect guy assemblies shall be forged from AISI grade 1035 or 1045 steel or equivalent and suitably heat-treated (quenched and tempered, normalized or annealed).

Comply

3.35.5 Turnbuckle devices shall be installed at the anchor end of the guy assembly for adjusting the guy tension.

Comply

3.35.5.1 In initial installations, the minimum take-up adjustment available after the structure is plumb and the guy tensions are set shall be 6 inches for guys with normal diameter of 0.5-inches and 10-inches for guys with normal diameter greater than 0.5 inches.

Comply

3.35.5.2 All guy wires shall be bonded to ground rods using, minimally, a #2AWG solid, tinned copper wire.

Comply

3.35.5.3 Bonding shall include use of guy wire grounding clamps that are tin-plated bronze (or similar type material) to prevent electrolysis.

Comply

3.35.5.4 Grounding attachment clamps shall be installed above the guy wire turnbuckle.

Comply

3.35.6 Guy wire anchor plates are to be grounded using, minimally, a #2AWG solid, tinned copper wire that is exothermically welded to the anchor plate. Welds shall be cleaned and treated with cold galvanized coatings to prevent rusting.

Comply

3.35.7 All guy wires shall include ice clips ahead of the preforms.

Comply

3.35.8 Turnbuckle safety cables must use a “Figure 8” configuration.

Comply

3.36 Required Tower Submittals

3.36.1 The Contractor shall furnish wind-load stress, geotechnical reports and foundation calculations used in the design of the proposed tower structure.

Comply

3.36.1.1 Existing towers shall be evaluated for structural, electrical grounding and foundation stability, inclusive of identification/resolution of corrosion within tubular members and the suitability to support additional antenna loads as necessary to accommodate the newly added Contractor-furnished equipment.

Comply

3.36.2 The Contractor shall furnish documentation approved by a registered professional engineer, licensed in the State of Florida certifying that the proposed new tower(s) and foundation(s), as well as required modifications to be made to existing towers, meet the requirements of EIA/TIA-222-H.

Comply

3.36.3 Prior to initial design review, Contractor shall perform soil pH value testing at all proposed new tower sites.

Comply

3.36.4 The Contractor shall furnish written certification that all installed tower components on both new and existing towers have been properly constructed and hot-dipped galvanized.

Comply

3.36.5 The Vendor shall furnish documentation as to any special condition or restriction applied to the use of materials, products or equipment contained in their response.

Comply

3.36.6 Contractor shall provide to The Customer, a minimum of three (3) sets of completed “as-builts” on each tower and shelter installed or modified in this project. In the case of new structures, this shall include engineering and design documentation from the tower and shelter manufacturer.

Comply

3.36.7 Installed structural members or welded structural assemblies, except for standard hardware, shall have a part number.

Comply

3.36.7.1 The part numbers shall correspond with the Contractor’s assembly drawings.

Comply

3.36.7.2 Part numbers are to be permanently attached (stamped, welded lettering, and/or stamped on a plate that is welded to the member, etc.) before all protective coatings are applied.

Comply

3.36.7.3 Attached/affixed part numbers shall have a minimum character height of 0.50 inches.

Comply3.36.8 The Contractor shall provide a detailed report of electrical ground resistance measurements of the completed, as-installed, electrical grounding system, on a per-site basis with field drawings to indicate the measurement at a specific location.

Comply

3.37 Identified Candidate Sites for New Towers

3.37.1 Customer Owned Land

3.37.1.1 Any Customer identified candidate tower sites from customer owned land, that may be proposed by the Vendor, is identified in Appendix C - Tower Candidate Sites List. Use of these sites is not required. Should the design criteria require other sites, the proposing vendor should identify those specific sites and the respective availability to support the proposed design.

Understood

3.37.2 Partnership Towers

3.37.2.1 Any Customer identified candidate tower sites made available through partnerships, that may be proposed by the Vendor, are identified in Appendix C - Tower Candidate Sites List. Use of these sites is not required. Should the design criteria require other sites, the proposing vendor should identify those specific sites and the respective availability to support the proposed design.

Understood

3.37.2.2 The customer has a legacy tower and shelter at the Utilities Site that will be used in the RF design.

Understood

3.37.2.3 The customer has a planned tower and shelter at the collocated SLERS Site that will be used in the RF design.

Understood

3.37.2.4 The customer has a legacy tower and equipment room at the Playa del Sol Site that will be used in the RF design.

Understood

3.37.2.5 The towers will require the vendor to perform a load study to be completed after the removal of the legacy feed horns.

Understood

A. The vendor will provide pricing as a part of this proposal to remove these feed horns. Should any of the metal have any value from a recycling center, the vendor will reimburse the City as part of the cost to remove the feed horns.

Comply

B. As an alternative, the City reserves the right to have the contractor leave the metal on site for the City to dispose of the metal with their own disposal process.

Understood

3.37.2.6 The shelter(s)/equipment room will be considered by the vendor and will be used for the new proposed equipment.

Understood

A. Any grounding updates for the shelter will be considered and priced as part of this proposal.

Comply

3.37.2.7 A generator load study will be completed by the vendor and a new generator will be provided per the generator specifications in Section 3.34.

Comply. Motorola has included an allowance to address this in case the condo buildings do not meet the load study. If the actual generator costs exceed the allowance, Motorola Solutions will work with the City of Fort Lauderdale for approvals and invoicing. If the actual generator costs are less than the stated allowance, Motorola Solutions will provide a Technology Credit to the City of Fort Lauderdale.

3.37.2.8 The vendor should confirm with the customer and the vendor that there will be no leased fees for the identified Partnership towers and land.

Comply

3.38 Site Work Requirements

3.38.1 Site Preparation and Sub-grading

3.38.1.1 General

A. Site clearing, initial earthwork, rough grading, and final grading as needed for installation of towers and equipment shelters is the Contractor's responsibility. The following describes a set of minimum requirements for the execution and completion of site-related construction activities.

Understood

B. A nationally recognized soil database should be used to determine expected soil conditions and all cost associated with anticipated soil conditions should be included in the Vendor's Cost Proposal.

Comply.

3.38.1.2 Dewatering of the Site

A. Control grading around excavations to prevent surface water from flowing into excavation areas.

Comply

B. Drain or pump as required, thereby maintaining all excavations, trenches, and pier holes free of water from any source and discharge to approved drains or channels. Commence dewatering action when water first appears and continue until work is complete to the extent that no damage will result from hydrostatic pressure, flotation, or other causes.

Comply

C. Use pumps of adequate capacity to ensure rapid drainage of area, and construct and use drainage channels and sub-drains with sumps, as required.

Comply

D. Remove unsuitable excessively wet sub-grade materials and replace with approved backfill material.

Comply. Motorola will come with a mutually agreed solution with the City of Fort Lauderdale if the backfill is required.

3.38.1.3 Soil Compaction

A. Compact sub-grades, fills, embankments and backfills using spreading equipment, tamping rollers, rubber-tired rollers, vibratory compactors, or power tampers, as required to obtain reasonable uniformity.

Comply

1. Nuclear soil testing results are required to be provided in a report to the Consultant.

Comply

B. Perform within moisture content range as specified to obtain required results with equipment used.

Comply

C. Achieve minimum densities specified as references to:

Comply

1. Cohesive soils - 95 percent maximum density at optimum moisture, AASHTO T99.

Comply

2. Cohesionless Soils – 70 percent of maximum relative density.

Comply

3. ASTM, STP 479 Bunnister method.

Comply

4. USBR - E12 relative density.

Comply

5. Relative density, ASTM D204911.2. Drilled Pier Foundations

Comply

3.38.1.4 General

Comply

A. Extent of Work: Perform all drilling and excavation and supply all labor and materials to construct drilled pier foundations, as necessary.

Comply

3.38.1.5 Performance

A. Quality Assurance will be met with a field inspection of the Customer's quality control designee.

Comply

B. The Customer's Project Representative will be designated to be responsible for field inspection of the drilled pier foundations.

Comply

1. The representative will transmit, in writing, to the consultant and contractor any materials or methods observed that do not conform to this specification and, if required, will not be considered for payment.

Comply

2. The Customer's Project Representative must inspect each drilled pier.

Comply

3. Specific responsibilities of The Customer's Project Representative will be:

a. Observe drilling excavation of drilled pier foundations.

Comply

1) Ensure the placement of anti-caving physical barriers or the use of special drilling mud to prevent excessive cavitation.

Comply

b. Inspect bearing elevation of drilled piers.

Comply

c. Observe placement of concrete and rebar within the drilled pier foundation to match design specification.

Comply

1) Ensure that no excessive earth contamination occurs. Contamination of poured concrete is sufficient to cancel the pour and request engineering inspection.

Comply

d. The Customer's representative shall photograph or film all foundation excavation and pouring activities Contractor's Qualifications.

Comply

e. The Contractor's qualifications must be minimum of two-year's experience in drilled pier construction, including experience with similar subsurface material, water conditions, shaft sizes, and special techniques as required.

Comply

3.38.1.6 Drilled Pier Details

A. Drilled pier shaft dimensions and top elevations shall be in accordance with foundation design calculations and drawings.

Comply

B. The drilled pier shaft bearing, or bottom elevation shall be at the elevation indicated, unless it is determined by the Customer that the bearing elevation should be adjusted.

Comply

C. The excavated pier shaft shall be drilled to required dimensions and elevations as indicated. Sidewall stability will be maintained during drilling and extend excavation to suitable material.

Comply

D. Inspection of each pier will be by The Customer's Project Representative and Contractor to determine suitability of supporting material for drilled piers.

Comply

E. Remove from bottom of drilled piers, loose material or free water in quantities sufficient to cause settlement or affect concrete strength as determined by the Customer.

Comply

F. Install temporary casing, where required, to prevent caving of drilled pier sides or excessive seepage.

Comply

G. Dewater all drilled pier excavations prior to cleaning, inspection, and placing concrete.

Comply

H. Each drilled pier must be inspected and approved by The Customer's Project Representative before any concrete may be placed.

Comply

I. Dispose of any excavated material at locations approved for that purpose.

Comply

3.38.1.7 Reinforcing Steel

A. Place reinforcement for drilled piers in accordance with foundation design documents.

Comply

B. Place bars as shown on foundation drawings with concrete cover of not less than 3- inches where exposed to soil.

Comply

C. A reinforcing cage shall be designed as a structural element and braced to retain its configuration throughout the placing of concrete and the extraction of the casing (if used) from the shaft.

Comply

D. Dewater drilled piers and maintain the excavation free of water prior to placing concrete.

Comply

E. Place concrete immediately after final inspection.

Comply

F. Place concrete immediately after completion of excavation and after The Customer's Project Representative has completed his inspection. Do not leave uncased excavations open overnight.

Comply

G. Free fall concrete (not over 6 feet) may be used provided it is directed through a hopper, or equivalent; such that fall is vertical down center of shaft without hitting sides.

Comply

1. Vibrate concrete only after casing, if used, has been pulled.

Comply

H. Place concrete in pier in one continuous pour operation from bottom to top.

Comply

I. The Customer's Project Representative will provide inspection during the removal of casing and placing of concrete.

Comply

1. Withdraw casing, if used, only as shaft is filled with concrete.

Comply

2. Always maintain an adequate head of concrete to balance outside soil and water pressure above the bottom of the casing during withdrawal.

Comply

3. Specific procedures that the Contractor will follow to accomplish this objective shall be submitted for approval.

Comply

J. Where the casing is removed, provide specifically designed concrete with a minimum slump of 5-inches and with a retarder to prevent arching of concrete (during casing pulling) or setting concrete until after casing is pulled.

Comply

1. Check concrete level prior to, during, and after pulling casing.

Comply

2. Pull casing before slump decreases below 5-inches as determined by testing.

Comply

K. During casing extraction, upward movement of the reinforcing steel shall not be permitted. Downward movement should not exceed 2-inches per shaft length.

Comply

L. Remove all water and concrete contaminated with soil, or water before resuming concrete placement.

Comply

M. Center reinforcing cages in the drilled pier excavation and suspend them in an approved manner prior to placement of concrete to the cutoff elevation.

Comply

N. Leave forms on pier for a period of three days.

Comply

O. Set anchor bolts to the manufacturer's required tolerances, using substantial templates or other approved method.

Comply

3.38.2 Concrete, Forms and Reinforcement

3.38.2.1 General

A. This RFP includes concrete, forms, and steel reinforcement.

Understood

B. This includes drilled pier foundations with square caps for steel structures, concrete pads for transformers and breakers, equipment shelter and tower foundations, and cable trenches.

Understood

3.38.2.2 Quality Assurance and Applicable Standards

A. American Concrete Institute (ACI)

1. ACI 304 - Recommend Practice for Measuring, Mixing, and Placing Concrete.

Comply

2. ACI 305 - Committee Report on Hot-Weather Concreting.

Comply

3. ACI 306 - Committee Report on Cold-Weather Concreting.

Comply

4. ACI 315 - Manual of Standard Practice for Detailing Reinforced Concrete Structures.

Comply

5. ACI 318 - Building Code Requirements for Reinforced Concrete.

Comply

B. American National Standards Institute (ANSI)

1. B 1 8.2.1 - Square and Hex Bolts and Screws, Including Askew Head Bolts, Hex Screws, and Lag Screws.

Comply

2. B 1 8.2.2 - Square and Hex nuts.

Comply

C. American Society for Testing and Materials (ASTM)

1. Midwest Concrete Industry Board (MCIB)

Comply

2. A36 - Structural Steel.

Comply

3. A82 - Cold-Drawn Wire.

Comply

4. 85 - Welded Steel Wire Fabric for Concrete Reinforcement.

Comply

5. A307 - Low-Carbon Steel Externally and Internally Threaded Standard Fasteners.

Comply

6. A615 - Deformed Billet Steel Bars for Concrete Reinforcement.

Comply

7. C31 - Making and Curing Concrete Compression and Flexure Test Specimens in the Field.

Comply

8. C33 - Concrete Aggregates.

Comply

9. C39 - Compressive Strength of Cylindrical Concrete Specimens.

Comply

10. C94 - Ready-Mixed Concrete.

Comply

11. C 143 - Slump of Portland Cement Concrete.

Comply

12. C 150 - Portland Cement.

Comply

13. C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

Comply

D. Equipment and Materials

1. Concrete Materials

a. Cement must conform to ASTM C 150.

Comply

b. Portland cement Type 1.

Comply

c. Water shall be clean and free from injuries amounts of oil, acids, alkaline, or other deleterious substances. Any potable drinking water will be acceptable.

Comply

d. Fine Aggregates such as Clean natural sand. Manufactured sand may be used upon written approval of The Customer's designee. They shall Conform to ASTM C33.

Comply

e. Coarse aggregates such as Clean crushed stone or processed gravel, not containing organic materials shall conform to ASTM C33.

Comply

f. 4-6 percent air shall be used in all concrete.

Comply

g. Water reducing admixture shall conform to ASTM C494, Type A.

Comply

2. Concrete Mix

a. Ready-mixed Concrete shall meet requirements of ASTM C94, and of materials and proportions specified.

Comply

b. Ready-mixed concrete plant shall be subject to approval of The Customer's Project Representative.

Comply

3. Form materials.

a. Exterior grade plywood minimum 5/8 inch thick.

Comply

b. Approved wood fiberboard.

Comply

c. Dressed lumber, free of loose knots.

Comply

d. Form tires shall be approved break-back type.

Comply

4. Steel Reinforcement

a. Reinforcement bars shall conform to ASTM A615, Grade 60 for all bars No. 4 or larger.

Comply

b. Tie and-all No.3 bars shall conform to ASTM A615, Grade 40.

Comply

c. Welded wire fabric shall conform to ASTM A185, using bright basic wire conforming to ASTM A82. Wire gauge No. 11 or smaller shall be galvanized.

Comply

5. Anchor Bolts

a. All anchor bolts required for complete installation shall be provided.

Comply

b. Anchor bolts and accessories shall conform to ASTM A307 using A36 steel.

Comply

c. Use hexagonal bolts and nuts conforming to ANSI B 1 8.2.1 and B 1 8.2.2.

Comply

d. All exposed area of anchor bolts and nuts, plus a minimum of three inches of embedded area, shall be hot-dipped galvanized.

Comply

e. Install as indicated on foundation drawings.

Comply

E. Performance

1. Field Testing

a. Field testing of concrete and making of the concrete test cylinders will be performed by an independent testing laboratory approved by the Customer’s Permit Department.

Comply

2. Laboratory Testing

a. Laboratory for testing shall be selected and paid by the Contractor.

Comply

b. Laboratory will furnish cylinder molds with cap seals or adequate means of identification.

Comply

c. Cylinders shall be tested conforming to ASTM C39.

Comply

1) Average strength of two test cylinders (at 28 days) shall be used as result of the test.

Comply

2) Break one test cylinder after 7-days curing, one after 14-days, and two after 28-days.

Comply

a) Results shall be provided to the Project Representative in a formal report. A copy shall be provided to the Consultant and Contractor.

Comply

3. Low Strength Concrete

a. Low strength is defined as concrete whose 7-day and 14-day test (average of 2 cylinders) is less than 70% and 85%, respectively, of the specified minimum 28-day compressive strength.

Comply

b. Concrete shall remain accessible with no other work performed that relates to or depends upon the questionable concrete until a formal decision as to the disposition of the concrete is given by the Customer's Project Representative.

Comply

c. Low strength concrete shall be removed and replaced if requested by the Customer's designee.

Comply

4. Preparation and Placing of Concrete

a. Clean bonding surfaces free from laitance and foreign materials.

Comply

b. Place concrete on property prepared and unfrozen sub grade and only in dewatered excavations.

Comply

c. Do not deposit partially hardened concrete or concrete contaminated by foreign materials.

Comply

d. Placing the concrete shall Conform to ACI 304.

Comply

e. Place concrete within 60 minutes after mixing, except The Customer's designee may extend the period to 90 minutes (maximum) dependent upon weather conditions.

Comply

f. Place in horizontal layers not exceeding 18-inches.

Comply

g. Vibrate concrete to produce solid mass without honeycomb or surface air bubbles.

Comply

5. Curing of Concrete

a. Cure with liquid membrane-forming compound conforming to ASTM C309, Type I. Apply per manufacturer's recommendations.

Comply

b. Apply curing compound to all exposed surfaces immediately after removing form or after finishing concrete.

Comply

c. Keep formwork wet until stripped.

Comply

d. Placing Concrete in Cold Weather

Comply

1) Conform to the practice recommended in ACI 306 when the temperature is below 40-degrees F or is likely to fall below 40-degrees F during a twenty-four-hour period after placing.

Comply

2) Protect pier caps and other concrete from freezing using insulating blankets.

Comply

6. Placing Concrete in Hot Weather

a. Conform to practices recommended in ACI 305 when temperature is 90- degrees Fahrenheit or above or is likely to rise above 90-degrees Fahrenheit within a twenty-four-hour period after placing.

Comply

7. Concrete Construction Joints

a. Locate where indicated. Conform to AC 318.

Comply

b. Clean and break laitance or other foreign material from bonding surface. Bed with 1-inch of grout for bonding in horizontal joints.

Comply

c. Concrete Surface Float Finish

Comply

1) Compact, accurately screed, and wood float all slabs to a true uniform surface.

Comply

2) Test surface with straightedge and eliminate high and low spots of more than 1/8-inch in 10 feet.

Comply

3) Use this finish in addition to the finishes specified below for all surfaces as indicated.

Comply

4) Use a final finish for footing slabs not exposed.

Comply

8. Concrete Hand-troweled Finish

a. Finish surface as in Float Finish and in addition, trowel and steel trowel to obtain a smooth dense finish after concrete has hardened to ring under the trowel.

Comply

b. Use this finish on all floors, slabs, and equipment bases not specifically designated for a different finish.

Comply

c. Concrete Broom Finish

Comply

1) Finish surface as in Float Finish and, in addition, draw a stiff bristled broom across the previously floated surface.

Comply

2) Corrugations shall be uniform in appearance, not more than 1/16-inch in depth and shall be perpendicular to direction of traffic.

Comply

3) Use this finish on all outdoor slabs subject to vehicular or pedestrian traffic and areas to receive grout.

Comply

9. Concrete Burlap Finish

a. Apply burlap surface treatment to exposed edges of slabs, curbs and foundations.

Comply

b. Wet and fill all voids using mortar with the same sand-cement ratio as original concrete. Use approximately 20 percent white cement to match concrete color.

Comply

c. Strike off all excess mortar flush with the surface using a burlap or canvas cloth with a circular motion.

Comply

d. Remove all rough spots and rub with cloth to leave a surface of uniform texture and appearance.

Comply

e. Finish shall result in a coating of mortar that will fill all small voids and air holes leaving a smooth surface.

Comply

f. Cure as specified under Curing Concrete.

Comply

10. Defective Concrete Surface Treatment

a. After removal of forms, remove all fins, projections and form ties.

Comply

b. Grout and cure all voids, damaged areas, and tie holes.

Comply

11. Concrete Forms

a. Treat forms with an approved oil or lacquer prior to placing reinforcement.

Comply

b. Wet forms with clean, clear water prior to placing concrete.

Comply

c. Adequately brace and stiffen forms to prevent deflection and settlement.

Comply

12. Steel Reinforcement

a. Place accurately, tie at intersection, and support on chairs. Conform to ACI 318.

Comply

b. Tie securely with 16 gauge or larger annealed iron wire.

Comply

c. Splice steel not less than 30 bar-diameters for A615, Grade 40, and 42 bar- diameters for A615, Grade 60, unless otherwise indicated.

Comply

d. Splice plain bars not less than twice that for deformed bars.

Comply

e. Lap welded wire fabric not less than the length of one mesh.

Comply

f. No.3 bars to be Grade 40, with all others to be Grade 60.

Comply

g. Provide ¾-inch chamfer for all exposed edges of concrete, vertical and horizontal.

Comply

3.39 Fences and Gates (Chain-Link Security Type)

3.39.1 General

3.39.1.1 Quality Insurance and Applicable Standards

A. Federal specification RR-F-191 - Fencing, wire and post, metal and gates, chain-link fence fabric, chain-link and accessories.

Comply

B. RR-F-191 - Fencing, wire and post, metal and gates, chain-link fence fabric, chain- link and accessories.

Comply

C. RR-F-221 - Fencing, wire, barbed wire, woven-wire and netting, fence post and accessories.

Comply

D. All installed fences and gates must meet Category IV wind ratings and be designed by a Professional Engineer.

Comply

3.39.2 Requirements

3.39.2.1 Manufacturer’s standard materials where such materials conform to these specifications or have been approved by The Customer.

Comply

3.39.2.2 Conform to FS RR-F-191 except as indicated or specified otherwise.

Comply

3.39.2.3 Fence height – 8 feet high galvanized chain link with 3-strand barbed wire at top (9½ feet overall height).

Comply

3.39.2.4 Gate widths as indicated on layout drawings.

Comply

3.39.2.5 Finish for fence framework and appurtenances (excluding fabric) – Galvanized with minimum weight for zinc per square foot as follows:

A. Pipe – 1.8 ounces.

Comply

B. Hardware and accessories – conform to FS RR-F-191.

Comply

C. Barbed wire – 0.80 ounce.

Comply

3.39.2.6 Finish for Fence Fabric

Comply

A. Galvanized per ASTM A392, Class-2 with 1.8-ounce, minimum weight, for zinc per square foot or, aluminum coated per ASTM A491, Class-2 with 0.40- ounce, minimum weight, for aluminum per square foot.

Comply

B. All fence and gates to have 3-strand barbed wire at top.

Comply

C. All materials furnished shall comply with the above requirements.

Comply

3.39.2.7 Fence Fabric

Comply

A. No.9 gauge, 2-inch diamond mesh chain-link fabric.

Comply

B. Top and bottom selvage twisted and barbed.

Comply

C. Fabric fastenings of 9-gauge galvanized wire ties.

Comply

3.39.2.8 Post, Top Rail, and Braces

Comply

A. Post

Comply

1. End, angle, corner or pull posts – 3-inches O.D. at 5.79 pounds per foot.

Comply

2. Line posts – 2.5-inches O.D. at 3.65 pounds per foot.

Comply

B. Top Rail

Comply

1. 1.625-inch O.D. standard weight steel pipe.

Comply

2. 18-foot minimum length of each section.

Comply

C. Expansion Type Coupling for Each Joint.

Comply

1. Diagonal truss rods 3/8 inch in diameter equipped with truss tightened.

Comply

2. Horizontal braces – 1.660-inch O.D. at 2.27 pounds per foot.

Comply

D. Post tops shall be designed as a weather tight closure cap for tubular post.

Comply

E. Top Rail Expansion Type Coupling for Each Joint.

Comply

F. Malleable Iron or Pressed Steel Barbed Wire Supporting Arms

Comply

1. Single arm at 45-degrees with vertical, sloping to outside of fence.

Comply

2. Constructed for attaching three rows of barbed wire to each arm and designed as a weather tight closure cap for tubular posts.

Comply

3. Designed for 200-pound minimum pull-down load.

Comply

4. Attached to steel posts or integral with post top.

Comply

5. Provided with openings to receive top rail.

Comply

G. Malleable Iron or Pressed Steel Stretcher Bars

Comply

1. One-piece, full height of fabric.

Comply

2. 3/6-inch x ¾-inch, galvanized.

Comply

3. Bands of galvanized steel or malleable iron.

Comply

H. Malleable Iron or Pressed Steel Bolts

Comply

1. Zinc coated.

Comply

2. Conform to FS FF-B-575.

Comply

3.39.2.9 Barbed Wire

Comply

A. Two-strand, l2½ gauge wire with 4-point barbs 5 inches O.C.

Comply

B. Conform to FS RR-F-221, Type 1, Style 2.

Comply

C. Three rows required on all fence and gates.

Comply

3.39.2.10 Gates

Comply

A. Framing

Comply

1. Frames of tubular members, 2-inch O.D. at 2.72 pounds per foot.

Comply

2. Intermediate horizontal and vertical members for proper gate operation and for attachment of fabric, hardware and accessories.

Comply

3. Frames assembled by welding or watertight galvanized steel rigid fittings.

Comply

4. Diagonal cross bracing of 3/8 inch diameter adjustable truss rods to provide frame rigidity.

Comply

5. Diagonal cross bracing of 3/8 inch diameter adjustable truss rods to provide frame rigidity.

Comply

B. Gate hardware hinges shall be of pressed or forged steel, or malleable iron, non- lift- off type, 1 to 1.2 pair per leaf.

Comply

C. Latches and Gate stops – Double Leaf.

Comply

1. Plunger-bar type latch, full gate height, designed to engage gate stop of flush- plate type with anchors.

Comply

2. Locking device and padlock eyes an integral part of latch.

Comply

3. Keeper to automatically engage gate leaf and secure free end of gate in full 90-degrees open position.

Comply

D. Latches – Single Leaf

Comply

1. Forked type to permit operation from either side of gate.

Comply

2. Padlock eye as integral part of latch.

Comply

3.39.2.11 Performance and Fence Installation

Comply

A. Follow general contour of ground and properly aligned.

Comply

B. Fence Post

Comply

1. Set in concrete retaining wall. Trowel finish tops of footings and dome to direct water away from posts.

Comply

2. Install plumb and in straight alignment.

Comply

3. Temporarily brace until concrete in bases has set.

Comply

4. Spaced 10 feet center-to-center, maximum.

Comply

C. Post Bracing

Comply

1. Installed at each end, at the gatepost, and on each side of corner posts.

Comply

2. Install after the concrete in post base has set.

Comply

3. Install so posts are plumb when diagonal rod is under tension.

Comply

D. Top Rails

Comply

1. Run continuously through post caps or barbed wire supporting arms.

Comply

2. Install expansion coupling at each joint.

Comply

E. Tension wire shall be weaved through the fabric and tie to each post with minimum 6-gauge galvanized wire.

Comply

F. Fabric

Comply

1. Stretch taut with equal tension on each side of line posts.

Comply

2. Fasten to top rail and steel posts with wire ties.

Comply

3. Space wire ties at 12-inches O.C. maximum on posts and at 24-inches O.C. maximum on top rail.

Comply

G. Stretcher Bars

Comply

1. Thread through or clamp to fabric 4-inches on center.

Comply

2. Secure to posts with metal bands spaced 15-inches on center maximum.

Comply

3. Install at each gate, pull and end post, and each side of corner post.

Comply

H. Barbed Wire

Comply

1. Attach three rows to each barbed wire supporting arm.

Comply

2. Pull wire taut and fasten securely to each arm.

Comply

3. Install four rows above fabric and on extended gate end members of gates.

Comply

I. Gates

Comply

1. Install plumb, level, and free swinging through full opening without interference.

Comply

2. Install all hardware, including keepers, ground set items and flush plate in concrete to engage gate stop.

Comply

3. Furnish and install gate alarms.

Comply

J. Repairing Damaged Coatings

Comply

1. Repair any damaged coating in the shop or field by recoating with compatible and similar coating.

Comply

2. Apply per manufacturer's recommendations.

Comply

3. Furnish and install Danger signs as approved by the Customer's designee.

Comply

3.40 Crushed Rock Surface

3.40.1

This section includes crushed rock surface and method of depositing for the placement of permanent crushed rock surfacing in equipment shelter areas.

Comply

3.40.2 Applicable Standards

3.40.2.1 American Society for Testing and Materials

A. C117 – Test for Materials Finer than No. 200 Sieve in Mineral Aggregate by Washing.

Comply

B. C131 – Test for Abrasion of Coarse Aggregates by Use of Los Angeles Machine.

Comply

C. C136 – Test for Sieve or Screen Analysis of Fine and Coarse Aggregates.

Comply

D. D423 – Test for Liquid Limit of Soils.

Comply

E. D75 – Sampling Stone, Slag, Gravel, Sand and Stone Block for Use as Highway Materials.

Comply

3.40.2.2 American Association of State Highway and Transportation Officials (AASHTO)

Comply

A. T99–Test for the Moisture Density Relations of Soils Using a 5.5-Pound Rammer and a 12-Inch Drop.

Comply

3.40.2.3 Sample and Testing

A. Test to determine conformance with all requirements for material quality and properties specified herein will be performed by an independent laboratory approved by the Customer and compensated by the Contractor.

Comply

B. Obtain representative samples of material in accordance with ASTM D75 for testing. Furnish the Customer's designee sufficient materials for testing from each sample at the time obtained.

Comply

C. Furnish specific schedule for sampling to provide the Customer's designee the opportunity to observe sampling.

Comply

3.40.2.4 Submittals. Includes, but not limited to, the following:

Comply

A. Test result reports from testing laboratory indicating conformance with the specifications.

Comply

B. Certification of conformance with the specifications.

Comply

3.40.3 Materials

3.40.3.1 Crushed rock surface shall consist of ¾-inch aggregate placed on top of a 6-mil polyvinyl barrier.

Comply

3.40.3.2 Aggregate shall consist of Crushed limestone or crushed natural gravel, free from lumps or balls of clay or other objectionable matter, and reasonably free from thin and elongated pieces of dirt.

Comply

3.40.3.3 Aggregates shall consist of angular fragments, durable and sound, and shall be reasonably uniform in density and quality.

Comply

3.40.4 Performance and General Requirements

3.40.4.1 Stockpiles

A. Only with approval of the Customer's designee in specified locations.

Comply

B. Clear and level storage sites prior to stockpiling.

Comply

C. Place in a manner and at locations designated by the Customer, providing separate stockpiles for materials from separate sources.

Comply

3.40.4.2 Preparation of Sub-Grade

A. Clean off all foreign substances.

Comply

B. Correct any ruts, depressions, or soft yielding spots and areas with inadequate compaction.

Comply

C. Treat all sub-grade areas with soil sterilant.

Comply

D. The Customer's Project Representative will inspect, prior to placing crushed rock surface, for adequate compaction and surface tolerances.

Comply

3.40.4.3 Grade Control

A. Establish and maintain by means of grade stakes, properly spaced so string lines may be stretched between stakes.

Comply

3.40.4.4 Placing of Materials

A. Deposit and spread material in a uniform lift/layer and compact to the thickness indicated and as specified. Spread material uniformly on the prepared sub-grade from moving vehicles or spreader boxes.

Comply

B. Level material to the required contour and grades.

Comply

C. Remove those portions of the layer, which became segregated or mixed with sub- grade material in spreading and replace with new material as required by the Customer’s designee.

Comply

D. Remove and repair sub-grade areas damaged during application of the crushed rock surface.

Comply

3.40.4.5 Shaping and Compacting Materials

A. Compact layers no less than 3-inches or more than 6-inches thick.

Comply

B. Roll to specified compaction requirements throughout full depth of layer with power rollers, rubber-tired rollers or combination.

Comply

C. Shape and smooth by blading and rolling with power roller, rubber-tired roller, or both.

Comply

D. Hand tamp in places not accessible to rolling equipment.

Comply

E. Base compaction on weight per cubic foot of material passing ¾-inch sieve and compact to at least 100 percent of maximum density at optimum moisture.

Comply

F. Determine and control compaction in accordance with AASHTO T99.

Comply

G. Surface shall show no deviation in excess of 3/8-inch in any 10 feet when tested with a 10-foot straightened applied parallel with and at right angles to the center lines of the paved area.

Comply

H. Correct any deviation specified in excess of this amount by loosening, adding or removing material, reshaping, watering, and compacting as requested by the Customer's designee.

Comply

3.41 Herbicide Applications

3.41.1 Equipment and Materials

3.41.1.1 Sprayers and applicators shall be suitable for intended use.

Comply

3.41.1.2 Mix herbicide per manufacturer's recommendations.

Comply

3.41.1.3 Herbicide shall be Krover (1) as manufactured by DuPont, Inc., or approved equal.

Comply

3.41.1.4 Do not apply herbicide if it is too windy or where other adverse weather conditions exist.

Comply

3.41.1.5 Apply at a rate of 10 pounds of product per acre, or in accordance with manufacturer's recommendations.

Comply

3.41.2 Performance

3.41.2.1 Apply only after final sub-grade has been established.

Comply

3.41.2.2 Apply before installation of vegetation barrier cloth and placement of crushed rock.

Comply

3.41.2.3 Follow manufacturer's recommendations on timing of application with respect to weather and barrier/crushed rock placement.

Comply

3.42 Minimum Subscriber Specifications

3.42.1

A list of radio/subscriber needs by agency is attached. See Appendix G.

Understood

All subscribers proposed as part of this proposal are optional as required by the RFP

3.42.2

Requirements for Subscriber Equipment: This includes all portable, mobile, and control station equipment.

Understood

3.42.2.1 All radio equipment proposed by Vendors and installed by the Contractor shall be FCC type accepted under Part 90 of the FCC Rules and Regulations.

Comply

All Motorola Solutions base stations, control stations, mobile radios, and portable radios described and proposed in our RFP response are FCC type accepted and of current manufacture. FCC type acceptance numbers are provided on the specification sheets for each radio and base station/repeater included in our proposal.

A. Vendor shall submit documentation verifying this type of acceptance.

Comply

All Motorola Solutions base stations, control stations, mobile radios, and portable radios described and proposed in our RFP response are FCC type accepted and of current manufacture. FCC type acceptance numbers are provided on the specification sheets for each radio and base station/repeater included in our proposal.

*Attach FCC Type Acceptance Documentation

Comply. See **Attachment 44 – 3.42.2.1.A & 3.42.5.1.C FCC Type Acceptance Documentation and MIL-STD Documentation.**

3.42.2.2 All supplied equipment proposed by the Vendor and provided/installed by the Contractor shall be in current production. No equipment announced as "end-of-life" or "end-of- support" are permitted to be proposed. Vendor shall supply a current end-of-support and end-of-life product list.

Comply

*Attach End-of-Support/End-of-Life Product List

Comply

3.42.3 APCO P25 Related Specifications

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

3.42.3.1 The Vendor shall provide documentation, and demonstrate P25 operational compliancy with, minimally, BK Technologies (RELM), EF Johnson/Kenwood, L3Harris, Motorola Solutions, & Tait portable, mobile, and control station radios. These radios must have been tested and certified to function on its proposed infrastructure technology. Documentation of P25 CAP certification shall be submitted as part of the response.

Comply

All vendor P25 Supplemental Declarations of Compliance (SDoC) and Summary Test Reports (STR) are available through the US Department of Homeland Security P25 Compliance Assessment Program website at: technology.

*Attach P25 CAP certification documentation

Comply

See **Attachment 46 – 3.42.3 CAP Certification Documentation**. Motorola Solutions' Subscriber and Infrastructure Product P25 Compliant Interfaces (CAI, ISSI, CSSI, etc.) are tested via our Verification and Validation Process prior to each software and/or hardware release ship acceptance. Ship Acceptance is required whenever changes are made for defect repair, feature enhancements or continuity of supply (software or hardware component refresh). The Verification and Validation process ensures all of our components comply to Motorola Solutions' defined system requirements including conformance with supported P25 Standards.

A. The Vendor shall also describe those processes and methods it employs to confirm where software releases and hardware changes to its products, included in the proposal, are verified for continued compatibility with P25 equipment manufactured and offered for purchase by others.

Comply

*Attach P25 Compliance Management Documentation

Comply

See **Attachment 46 – 3.42.3 CAP Certification Documentation.** Additionally, **Exhibit C – Compliance – Portable Radio Table** includes the portable radio table that was attached to the RFP.

The proposed radio system is built on Motorola Solutions' ASTRO 25 radio system platform, which is an IP–based technology that conforms to applicable P25/TIA–102 protocol service documents and requirements, including the Common Air Interface (CAI), Inter–RF Subsystem and Console Subsystem (ISSI/CSSI) Interface, and the Conventional Fixed Station Interface (FSI).

Motorola Solutions is proud to be part of the P25/TIA–102 (Telecommunications Industry Association) standardization process. P25 is a suite of user driven system standards that define digital radio communications system architectures capable of serving the needs of Public Safety and Government organizations. P25 open system standards define the interfaces, operation, and capabilities of any P25 compliant radio system. In other words, a P25 radio is any radio that conforms to the P25 standard in the way it functions or operates. The P25 suite of standards enables interoperability of a diverse set of

interfaces and services to cover different communication needs and configurations. P25/TIA–102 standards are used to design and manufacture interoperable communications equipment for mission critical operations.

The P25 standards process is an iterative process between TIA TR8 industry representatives and P25 users detailing specific functions and/or capabilities as needed. TIA standards documents define the protocols, messages, and procedures that are used by standard interfaces and standard services. These standards enable interoperability of the standard features. The user perspective is articulated in the P25 SPUN (Statement of P25 User Needs). .

P25/TIA–102 standard documents organized around a particular interface (e.g. TDMA CAI) or service (e.g. Location). There are typically multiple documents associated with a particular standard interface or standard service. The P25 standard technical documents are used by industry to provide the desired voice and data services and capabilities of P25 in subscriber radios, base stations, repeaters, and systems. There are also typically many features associated with a particular standard interface or standard service. Core Definition Documents define the messages, procedures and protocols used by a standard interface or standard service and enable the development of interoperable P25 equipment. TIA documents also define standard test methods and, sometimes, standard performance metrics associated with the standard interfaces, services, and features they support. Standard Testing Documents provide a consistent method to verify the implementation adheres to the P25 Core Definition Documents.

A manufacturer may choose to implement any or all standard features associated with any or all standard interfaces or services. Therefore, discussions of “compliance” in the context of the P25 SPUN or in the context of a particular TIA document can be ambiguous. To avoid ambiguity about “compliance”, it is beneficial to identify specific standard features operating over specific standard interfaces or standard services. In this more specific context, compliance statements may then refer to messages, procedures, protocols, or tests associated with the intended application of the standard feature, which in turn may reference specific sections of multiple standard documents.

The P25 Technology Interest Group publishes a listing of features covered by TIA–102/P25 published standards and these features are described in the Project 25 TIA–102 Documentation Suite Overview TSB–102–D. The reader should also understand that Project 25 does not limit the functionality of equipment, and intentionally allows equipment to include “non P25” capabilities as long as they do not interfere with P25 capabilities.

Motorola Solutions is providing a listing of TIA–102/P25 features included in its proposed systems and products and the TIA–102/P25 standard documents in which those features are defined and or tested. Motorola Solutions’ implementation of standard features is based on published standard documents and this enables interoperability with other manufacturers that have implemented the same features using the same published standard documents.

Table: P25 Trunked Feature Matrix

TIA-102 STANDARD PUBLISHED P25 TRUNKED FEATURES	FDMA CAI	TDMA CAI	TIA STANDARDS DOCUMENTS
VOICE CALLS			
Group Voice Call	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E / TIA-102.AABF-D / TIA-102.AABA-C C / TIA-102.AABB-B / TIA-102.BBAC-A;-1 / TIA-102.CABC-C;C-1 / TIA-102.BCAE

TIA-102 STANDARD PUBLISHED P25 TRUNKED FEATURES	FDMA CAI	TDMA CAI	TIA STANDARDS DOCUMENTS
Individual Voice Call	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E / TIA-102.AABF-D / TIA-102.AABA-C C / TIA-102.AABB-B / TIA-102.BBAC-A;-1 / TIA-102.CABC-C;C-1 / TIA-102.BCAE
Availability Check on Called Party	Yes	Yes	TIA-102.AABD-B / TIA-102.AABC-E / TIA-102.AABF-D/ TIA-102.AABA-C/TIA-102.AABB-B/TIA-102.BBAC-A / TIA-102.BCAE
Broadcast Voice Call	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E / TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1 / TIA-102.BCAE
Announcement Group Call	Yes	Yes	TIA-102.AABD-B / TIA-102.AABC-E / TIA-102.AABF-D / TIA-102.AABA-C/TIA-102.AABB-B/TIA-102.BBAC-A / TIA-102.CABC-C;C-1 / TIA-102.BCAE
Emergency Group Voice Call	Yes	Yes	TIA-102.AABD-B / TIA-102.AABC-E / TIA-102.AABF-D / TIA-102.AABA-C/TIA-102.AABB-B/TIA-102.BBAC-A / TIA-102.CABC-C;C-1 / TIA-102.BCAE
Emergency Call	Yes	Yes	TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C/TIA-102.AABB-B/TIA-102.BBAC-A / TIA-102.CABC-C;C-1 / TIA-102.BCAE
Pre-Programmed Emergency Group Call	Yes	Yes	TIA-102.AABD-B/ TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C/TIA-102.AABB-B/TIA-102.BBAC-A / TIA-102.BCAE
Group Regrouping (part of P25 Dynamic Regrouping)	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABH
MOBILITY MANAGEMENT			
Roaming	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1
Intra-System Roaming (Automatic)	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A
Inter-System Roaming (Manual)	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A
Registration	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1
Restricting service access only to valid SU	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1

TIA-102 STANDARD PUBLISHED P25 TRUNKED FEATURES	FDMA CAI	TDMA CAI	TIA STANDARDS DOCUMENTS
De-registration	Yes	Yes	TIA-102.AABD-B/ TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C/TIA-102.AABB-B/TIA-102.BBAC-A / TIA-102.CABC-C;C-1
Group Affiliation	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1
Call Restriction	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1
Call Routing	Yes	Yes	TSB-102-D
Wide Area Call	Yes	Yes	TIA-102.AABD-B/ TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C/TIA-102.AABB-B/TIA-102.BBAC-A / TIA-102.CABC-C;C-1
Location Registration	Yes	Yes	TIA-102.AABD-B/ TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C/TIA-102.AABB-B/TIA-102.BBAC-A
WUID Validity Timer	Yes	Yes	TIA-102.AABD-B/ TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C/TIA-102.AABB-B/TIA-102.BBAC-A
KEY MANAGEMENT			
KFD Based Key Management			
Manual Rekeying Features	Yes	Yes	TIA-102.AACD-A / TIA-102.BBAC-A
Keyload	Yes	Yes	TIA-102.AACD-A / TIA-102.BBAC-A
Key Erase	Yes	Yes	TIA-102.AACD-A / TIA-102.BBAC-A
Erase all Keys	Yes	Yes	TIA-102.AACD-A / TIA-102.BBAC-A
View Key Info	Yes	Yes	TIA-102.AACD-A / TIA-102.BBAC-A
KMF Based Key Management			
Unique Key Encryption Key (UKEK)	Yes	N/A	TIA-102.AACD-A / TIA-102.AACA-A; A-1
Individual Radio Set Identifier (Ind RSI)	Yes	N/A	TIA-102.AACD-A / TIA-102.AACA-A; A-1
Key Management Facility Radio Set Identifier (KMF RSI)	Yes	N/A	TIA-102.AACD-A / TIA-102.AACA-A; A-1
Message Number Period (MNP)	Yes	N/A	TIA-102.AACD-A / TIA-102.AACA-A; A-1
Keyload	Yes	N/A	TIA-102.AACD-A / TIA-102.AACA-A; A-1
View Individual RSI	Yes	N/A	TIA-102.AACD-A / TIA-102.AACA-A; A-1

TIA-102 STANDARD PUBLISHED P25 TRUNKED FEATURES	FDMA CAI	TDMA CAI	TIA STANDARDS DOCUMENTS
Load Individual RSI	Yes	N/A	TIA-102.AACD-A / TIA-102.AACA-A; A-1
View KMF RSI	Yes	N/A	TIA-102.AACD-A / TIA-102.AACA-A; A-1
Load KMF RSI	Yes	N/A	TIA-102.AACD-A / TIA-102.AACA-A; A-1
View MNP	Yes	N/A	TIA-102.AACD-A / TIA-102.AACA-A; A-1
Load MNP	Yes	N/A	TIA-102.AACD-A / TIA-102.AACA-A; A-1
View Keyset Info	Yes	N/A	TIA-102.AACD-A / TIA-102.AACA-A; A-1
Activate Keyset	Yes	N/A	TIA-102.AACD-A / TIA-102.AACA-A; A-1
SECURITY SERVICES			
Confidentiality			
Encryption Transformation			
Traffic Encryption	Yes	Yes	TIA-102.AAAB-B, TIA-102.AAAD-B/ TIA-102.AAAC/ TIA-102.AAAD-B / TIA-102.BBAC-A
Integrity			
Chronological Integrity	Yes	Yes	TIA-102.AAAB-B / TIA-102.BBAC-A
Message Integrity	Yes	Yes	TIA-102.AAAB-B / TIA-102.BBAC-A
SU Authentication	Yes	Yes	TIA-102.AACE-A / TIA-102.BBAC-A
Key Management	Yes	N/A	TIA-102.AAAB-B/ TIA-102.AACA-A; A-1
Physical Key Distribution	Yes	N/A	TIA-102.AAAB-B/ TIA-102.AACA-A; A-1
Over-the-Air Key Distribution	Yes	N/A	TIA-102.AAAB-B/ TIA-102.AACA-A; A-1
Key Download Procedures	Yes	N/A	TIA-102.AAAB-B/ TIA-102.AACA-A; A-1
Key Activation Procedures	Yes	N/A	TIA-102.AAAB-B/ TIA-102.AACA-A; A-1
Destruction of Keys	Yes	N/A	TIA-102.AAAB-B/ TIA-102.AACA-A; A-1
Rekey Request	Yes	N/A	TIA-102.AAAB-B/ TIA-102.AACA-A; A-1
Provisioning of the MR	Yes	N/A	TIA-102.AAAB-B/ TIA-102.AACA-A; A-1
Key Compromise	Yes	N/A	TIA-102.AAAB-B/ TIA-102.AACA-A; A-1
ENCRYPTION			
Encryption	Yes	Yes	TSB-102-D / TIA-102.AAAB-B/TIA-102.AAAD-B / TIA-102.AACD-A / TIA-102.AACA-A; A-1/ TIA-102.BBAC-A
DES-OFB Encryption of Voice	Yes	Yes	TSB-102-D / TIA-102.AAAD-B / TIA-102.BBAC-A
AES Encryption of Voice	Yes	Yes	TIA-102.AAAD-B / TIA-102.BBAC-A

TIA-102 STANDARD PUBLISHED P25 TRUNKED FEATURES	FDMA CAI	TDMA CAI	TIA STANDARDS DOCUMENTS
AES Encryption of Packet Data	Yes	Yes	TIA-102.AAAD-B / TIA-102.BBAC-A
Multiple Encryption Algorithms	Yes	Yes	TIA-102.AACA-A; A-1 / TIA-102.BBAC-A
Multiple Encryption Keys	Yes	Yes	TIA-102.AAAD-B / TIA-102.BBAC-A
SUPPLEMENTARY SERVICES			
Priority Call	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.BCAE
Preemptive Priority Call	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.BCAE
Dispatcher Audio Takeover	Yes	Yes	TSB-102-DAGA / TIA-102.BBAC-A / TIA-102.BCAE
Emergency Alarm	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-D/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1
Silent Emergency	Yes	Yes	TSB-102-D
Radio Unit Monitoring	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1
Talking Party Identification	Yes	Yes	TSB-102-D
Call Alerting	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1
Radio Check	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1
Radio Inhibit	Yes	Yes	TSB-102-D/ TIA-102.AABD-B /TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1
Radio Uninhibit	Yes	Yes	TSB-102-D/ TIA-102.AABD-B /TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1
Alert Tones	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A
SU Status Update	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1



TIA-102 STANDARD PUBLISHED P25 TRUNKED FEATURES	FDMA CAI	TDMA CAI	TIA STANDARDS DOCUMENTS
Dynamic Regrouping (part of P25 Dynamic Regrouping)	Yes	Yes	TSB-102-D/ TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABH
SYSTEM SERVICES			
Network Status Broadcast Message	Yes	Yes	TIA-102.AABD-B / TIA-102.BBAC-A
System Status Broadcast Message	Yes	Yes	TIA-102.AABD-B / TIA-102.BBAC-A
Channel Identifier Update Broadcast Message	Yes	Yes	TIA-102.AABD-B / TIA-102.BBAC-A
Adjacent Status Broadcast Message	Yes	Yes	TIA-102.AABD-B / TIA-102.BBAC-A
Backup Control Channel Broadcast Message	Yes	Yes	TIA-102.AABD-B / TIA-102.BBAC-A
MISCELLANEOUS			
Electronic Serial Number	Yes	Yes	TSB-102-D
Queuing	Yes	Yes	TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1
Message Trunking	Yes	Yes	TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1
Transmission Trunking	Yes	Yes	TIA-102.AABD-B / TIA-102.AABC-E/ TIA-102.AABF-D / TIA-102.AABA-C / TIA-102.AABB-B / TIA-102.BBAC-A / TIA-102.CABC-C;C-1
Network Access Code	Yes	Yes	TIA-102.AABD-B / TIA-102.BBAC-A
Extended hunt sequence	Yes	Yes	TIA-102.AABD-B / TIA-102.BBAC-A
PHYSICAL LAYER			
P25 Phase 1 FDMA			
P25 Phase 1 FDMA CAI	Yes	N/A	TSB-102-D / TIA-102.BAAA-B/TIA-102.BAAC-D/TIA-102.BAAB-B
Enhanced Full Rate Vocoder	Yes	N/A	TIA-102.BABA-A / TSB-102.BABE / TIA-102.BABB / TIA-102.BABC / TSB-102.BABD /TIA-102.BAAB-B
Frequency Division Multiple Access (FDMA)	Yes	N/A	TSB-102-D / TIA-102.BAAA-B /TIA-102.BAAB-B
9.6 kbps Gross Bit Rate	Yes	N/A	TSB-102-D / TIA-102.BAAA-B/TIA-102.BAAB-B
C4FM and CQPSK Modulation	Yes	N/A	TSB-102-D / TIA-102.BAAA-B / TIA-102.BAAC-D / TIA-102.CAAA-F / TIA-102.CAAB-E; E-1 / TIA-102.BAAB-B

TIA-102 STANDARD PUBLISHED P25 TRUNKED FEATURES	FDMA CAI	TDMA CAI	TIA STANDARDS DOCUMENTS
12.5 KHz Channel Bandwidth	Yes	Yes	TIA-102.CAAA-F / TIA-102.CAAB-E; E-1 / TIA-102.BAAB-B
P25 Phase 2 TDMA			
P25 Phase 2 TDMA CAI	N/A	Yes	TIA-102.BBAB / TIA-102.BCAD / TIA-102.BCAE
Enhanced Half Rate Vocoder	N/A	Yes	TIA-102.BABA-1 / TSB-102.BABE / TIA-102.BABB / TIA-102.BABC / TSB-102.BABD / TSB-102.BABF / TIA-102.BABG / TIA-102.BCAD / TIA-102.BCAE
Time Division Multiple Access (TDMA)	N/A	Yes	TIA-102.BBAB / TIA-102.CCAB-B / TIA-102.BCAD
12 kbps Gross Bit Rate	N/A	Yes	TIA-102.BBAB / TIA-102.CCAB-B
HCPM and HDQPSK Modulation	N/A	Yes	TIA-102.BBAB / TIA-102.CCAB-B
12.5 KHz Channel Bandwidth	Yes	Yes	TIA-102.BBAB / TIA-102.CCAB-B
DATA SERVICES			
Packet Switched Confirmed Delivery Data	Yes	N/A	TSB-102-D / TIA-102.BAEB-C
Packet Switched Unconfirmed Delivery Data	Yes	N/A	TSB-102-D / TIA-102.BAEB-C
Packet Switched Data Network Access	Yes	N/A	TSB-102-D / TIA-102.BAEB-C
TCP/UDP Port Number Assignments	Yes	N/A	TIA-102.BAJD-A
Data Configuration - Radio to FNE	Yes	N/A	TIA-102.BAEA-C / TIA-102.BAEB-C / TIA-102.BAEE-C
Packet Data Registration	Yes	N/A	TIA-102.BAEB-C
SU Registration	Yes	N/A	TIA-102.BAEB-C
SU Deregistration	Yes	N/A	TIA-102.BAEB-C
SU Location Tracking	Yes	N/A	TIA-102.BAEB-C
Mobile Data Interface (A)	Yes	N/A	TSB-102-D / TIA-102.BAEG-A
Link Layer and Physical Layer Protocols	Yes	N/A	TIA-102.BAEA-C / TIA-102.BAEB-C
SNDCP (Subnetwork Dependent Convergence Protocol)	Yes	N/A	TIA-102.BAEB-C
Fixed Host Data Interface (Ed)	Yes	N/A	TSB-102-D / TIA-102.BAEB-C

TIA-102 STANDARD PUBLISHED P25 TRUNKED FEATURES	FDMA CAI	TDMA CAI	TIA STANDARDS DOCUMENTS
Ethernet (802.3)	Yes	N/A	TIA-102.BAEB-C
Internet Protocol Suite	Yes	N/A	TIA-102.BAEB-C

B. Allow operations on P25 trunked and conventional (analog/P25) systems with priority scan of talk groups or channels on both system types in the same scan list.

Exceeds

In addition to meeting the RFP requirement for priority talkgroup scan across a P25 system, the APX mobiles exceed your performance requirement as they can scan between systems of differing types (multi system scan) including P25 Trunked Phase 1 and Phase 2, P25 Conventional, and Analog Conventional systems.

C. Must meet APCO minimum recommendations and EIA/TIA standards for P25 Public Safety digital trunked radio systems. Furnished equipment must be operable on conventional and both Phase 1 and Phase 2 infrastructures.

Comply

D. Offer digital voice, using an Advanced Multi-Band Excitation +2 (AMBE+2) or Newer P25 Phase 1 and Phase 2 vocoder.

Comply

The APX family of radios exceeds this requirement by utilizing the Motorola Advanced Cryptographic Engine (MACE) chip. The MACE is an on-board radio encryption device providing cryptographic services for all voice and data communications. It also provides a secure environment for storing encryption keys via a hardened tamper-resistant chassis. The MACE has the capability to not only store the City's encryption keys but will also protect those keys from being accessed by unauthorized users through physical or electronic means. Any physical disruption of the MACE chip automatically triggers the radio to erase all key material.

This capability allows the APX family of radios to meet Federal Information Processing Standard Publication (FIPS) encryption standards FIPS 140.2 Level 3 and FIPS 197. APX series P25 two-way radios are the only radios in the industry that meet the FIPS 140-2 Level 3 validation.

E. All equipment proposed shall be capable of standards-based voice encryption: federally approved P25 AES 256 coding to provide enhanced security during transmission and reception of sensitive communications; DES-OFB and other modes of voice encryption may be proposed as optional.

Comply

3.42.3.2 Support special services, i.e. encrypted voice, Computer Aided Dispatch (CAD), and Automatic Vehicle Location (AVL).

Comply

*Attach Special Services Documentation

Comply. See **Attachment 17 – 3.4.13.2.F Functional Description Proposed Broadband Gateway Platform or Solution (Solution Description).**

3.42.3.3 Temperature Range: -30 °C to +60 °C Humidity: 95% relative humidity at 50 °C

Comply

All proposed subscribers meet this requirement, however the proposed IMPRES 2 Li-Ion Battery is rated for the Temperature Range -20°C to +60°C.

3.42.3.4 All radio units are expected to be equipped with electronic, alphanumeric display(s) of a minimum of eight characters, used to readily identify selected talk groups and operating modes, (i.e. clear voice, encrypted voice, system availability, channel/talk group selection, incoming user ID, call alerts and operational status such as scan and channel busy).

Comply

3.42.3.5 Talk Group Selection must be selectable by a rotary-knob style input. Additional selection types are optional.

Comply

3.42.3.6 Talk Group Capacity: 16 minimum, per system

Comply

3.42.3.7 Channel Capacity: 500 channels (Single band radio), 700 channels (Multi-band radio)

Comply

3.42.3.8 The volume control is expected to be fully adjustable from zero to maximum audio output level.

Comply

3.42.3.9 Radio operating information shall be contained in an electrically erasable memory device. Unit will be fully programmable from a laptop/desktop computer, via the accessory receptacle.

Exceeds

On all proposed portable subscribers, the APX portable radio may also be fully programmable via Over the Air Programming over a P25 data channel.

3.42.3.10 Include transmit time out timer to warn the user that the radio may be transmitting longer than a predetermined time limit and then disable the transmitter.

Exceeds

In addition to the time out timer function due to “transmitting longer than a predetermine time limit”, the APX radio also will time out after a pre-determined time period if the PTT is pressed and no voice is detected from the user. This is a programmable setting in the APX radio.

Time-Out-Timer Feature

This feature turns off the transmitter on the APX radio. A user cannot transmit longer than the preset timer setting. If a user attempts to do so, the radio automatically stops the transmission, and the user hears a talk-prohibit tone.

The timer is defaulted at 60 seconds, but it can be pre-programmed from 3 to 120 seconds, in 15-second intervals, or it can be disabled entirely for each radio mode, by a qualified radio technician.

Note: The user will hear a brief, low-pitched, warning tone four seconds before the transmission times out.

- Hold down the PTT button longer than the pre-programmed time. User hears a short, low-pitched warning tone, the transmission is cut off, and the LED goes out until the user releases the PTT button.
- Release the PTT button. The timer resets.
- To re-transmit, press the PTT button.

3.42.4 Programming and Key Loading

3.42.4.1 The vendor shall provide to the Customer no less than eight (8) sets of radio programming software, appropriately configured laptop computers, and all other support equipment and special cables necessary to program and encrypt (key load) each type of radio and control station equipment/device supplied by the Proposer.

Comply

*Attach Programming Documentation

Comply. See **Attachment 49 – 3.42.4.1 Programming Documentation.**

3.42.4.2 The vendor shall provide to the Customer no less than one Key Loading device and appropriate cables as are necessary to manage encryption on all proposed equipment.

Comply

*Attach Key Loading Documentation

Comply. See **Attachment 50 – 3.42.4.2. Key Loading Documentation.**

3.42.4.3 Radio operating information shall be contained in an electrically erasable memory device.

Exceeds

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

On all proposed portable subscribers, the APX portable radio may also be fully programmable via Over the Air Programming over a P25 data channel.

A. Unit will be fully programmable from a laptop/desktop computer, via the accessory receptacle, or remotely over WiFi or Bluetooth.

Comply

3.42.5 Portable Radio Equipment Specifications

3.42.5.1 Size, Weight, and Durability Specifications

A. Small enough to be carried and manipulated with both bare and gloved hands.

Comply

B. Lightweight enough to limit fatigue while being carried for a full twelve (12) hour shift.

Comply

C. Include heavy duty construction and weather-sealed cases to meet Military Standards 810 D, E, F and G for shock, vibration, dust, humidity, high/low temperature and blowing rain.

Exceeds

Motorola Solutions APX Radios are rated for MIL-STD C,D,E,F,G, and H for Low Pressure, High Temperature, Low Temperature, Temperature Shock, Solar Radiation, Rain, Humidity, Salt Fog, Blowing Dust, Blowing Sand, Submersion, Vibration, Shock, Shock (Drop).

*Attach MIL-STD Documentation

Comply. See **Attachment 44 – 3.42.2.1.A & 3.42.5.1.C FCC Type Acceptance Documentation and MIL-STD Documentation.**

D. Include top mounted rotary controls with positive stops for volume and channel selection. Control placement must allow gloved hand operation, as is typically needed by the fire service or during cold weather events.

Exceeds

Fire service radios additionally offer angled, enlarged knobs for ease of use with firefighter gloves.

We specifically designed an XE model for the APX 6000 and APX 8000 subscribers with the following features to support operations typically seen in the Fire Service:

- An enlarged control top with additional spacing between the volume, channel knob, and antenna.
- Exaggerated controls with larger knobs, prominent A/B/C and Encryption switches for higher tactility through heavy gloves.
- Larger top display for ease of visibility in turn out gear.
- Large emergency button that is protected a ridge to prevent in inadvertent activation.
- High tactility PTT button.
- Water porting speaker grill to drain water and debris quickly.

These features allow for easier operation of the radio in comparison to the standard radio design.

E. Contain no protruding push-to-talk switch, thereby preventing accidental transmitter operation or potential damage to the switch caused by impact.

Comply

F. Include a protected emergency button to allow easy access when needed but incorporating an ergonomic design in which the emergency function could not be accidentally activated.

Exceeds

On all proposed portable subscribers, the emergency button is recessed and shielded to prevent accidental activation and is located at the base of the portable radio antenna, so it is easy to locate with one hand (even a gloved hand) and activate the emergency alert/call without the user being distracted from the situation at hand. The APX radio exceeds this requirement because the emergency button can also be programmed to have a delay to ensure that the user intends to activate it.

3.42.5.2 Antenna, Accessory, and Carrying Case Specification

A. An accessory receptacle shall be provided for the connection of external devices such as remote microphones or combination remote speaker/microphone units (with or without antenna), vehicular adapters, and mobile data computer equipment.

Comply

*Attach Portable Radio Accessory Documentation

Comply

B. Radios are expected to be capable of operation with traditional speaker/ microphones as well as sub-miniature radio surveillance accessories.

Comply

C. All speaker microphones must have noise cancelling capabilities and 3.5mm jack for the ability to use a Receive-Only earpiece.

Comply

D. Carrying case alternatives should include leather carrying case with swivel mounts, as well as chemical resistant cases (nylon or similar plastic material) for use by hazardous material groups.

Comply

*Attach Portable Radio Carrying Case Option Documentation

Comply. See **Attachment 52 – 3.42.5.2 Portable Radio Accessory Documentation.**

E. The antenna should be physically short and in keeping with the size of the radio package. Units are expected to be operable, within the coverage area using the smallest unity-gain flexible antenna available.

Comply

*Attach Antenna Specifications Documentation

Comply. See **Attachment 54 – 3.42.5.2.E Antenna Specifications Documentation.**

F. Each Portable radio should be supplied with, at a minimum, a belt clip

Comply

3.42.5.3 Electrical Specifications

A. Transmitter specifications are as follows:

Understood

1. Frequency Range: 764 to 870

Comply

2. RF Output Impedance: 50 ohms

Comply

3. Output Power: 3 W 700/800MHz

Comply

4. Frequency Stability: 1.5 PPM from -28°C to +58°C

Comply

5. Emissions: 16K0F3E; 11K0F3E; 8K10F1D; 8K10F1E; 9K80F1D, 9K80D7W or comparable Phase 2 Emission

Comply

6. Modulation Deviation: +/-2.5KHz for 12.5KHz channel; +/-3 KHz for NPSPAC;

Comply

7. Audio Response: +/-3 dB of a 6 dB/octave

Comply

8. Audio Distortion: Less than 2% at 1 KHz

Comply

9. Spurious/Harmonic: -50 dB 12.2.3.1.10. Hum and Noise: -35 dB 12.2.3.1.11. Duty Cycle: Intermittent

Comply

B. Receiver specifications are as follows:

Comply

1. Frequency Range: 764 870MHz

Comply

2. Channel Spacing: 12.5/6.25 KHz/NPSPAC

Comply

3. Adjacent Channel: -60dB (Single band radio), -65dB (Multi band radio) Rejection

Comply

4. Digital Sensitivity: 5% BER: 0.25 µV

Comply

5. Intermodulation Rejection: -72 dB (Single band radio) -74 dB (Multi-band radio)

Comply

6. Spurious Response Rejection: -72 dB (Single band radio) -70 dB (Multi-band radio)

Comply

7. Frequency Stability: 1.5 PPM from -30° to +60°C

Comply

8. Audio Output: 1.5 W12.2.3.2.9. Audio Distortion: No more than 2% at 1 KHz12.2.4. Power and Charging Specifications

Comply

C. Battery Pack Specifications

Comply

1. Radio unit battery packs are expected to operate to provide sufficient power for a full twelve-hour work period.

Comply

*Attach Power Calculations Documentation

Comply. See **Attachment 44 – 3.42.2.1.A & 3.42.5.1.C FCC Type Acceptance Documentation and MIL-STD Documentation**. The information in this attachment includes the information requested by this requirement.

2. Environmental: MIL-STD 810 C, D, E, F and G for shock, vibration, humidity and high/low temperature.

Comply

3. Temperature Range: -30°C to +60°C

Comply

4. Humidity: 95% relative humidity at 50°C

Comply

5. The battery packs should provide a reasonably long-life (i.e., two years) within the typical operational profile of 5% transmit, 5% receive and 90% standby/on.

Comply

D. A range of accessories is expected to be available to support in-field battery charging.

Comply

1. Provide single-unit 120VAC rapid charger capable of fully charging a discharged high-capacity battery pack within a one-hour period.

Comply

2. Provide alternative 120VAC multi-bank chargers with a minimum of 6 slots.

Comply

3. Provide optional single-unit 12VDC rapid charger for vehicular operation.

Comply

3.42.6 Mobile Radio Equipment Specifications

3.42.6.1 Front mount and rear mount, dual control-head with single rear mount radio and dual radios with single control-head configurations must be available to meet the needs of the different public safety users. Rear mount radios may require weatherproof control heads, speakers, microphones, hand-held controllers, and other accessories (specific for fire operations).

Comply

*Attach Mounting Options Documentation

Comply. See **Attachment 56 – 3.42.6.1 Mounting Options Documentation**.

3.42.6.2 Be capable of providing 9.6kb/s data-messaging transmission capabilities.

Comply

3.42.6.3 Primary Input Voltage: 11 to 16 VDC, negative ground Battery Drain: (a) Standby: 1.5 amperes, max. (b) Receive: 4.0 amperes, max. (c) Transmit: 15.0 amperes, max.

Comply

3.42.7 Electrical Specifications

3.42.7.1 Transmitter Specifications

A. Frequency Range: 764 to 870MHz

Comply

B. RF Output Impedance: 50 ohms

Comply

C. Output Power: 30 W (700MHz)/35W (800MHz) (Single band radio); 50 W (VHF) (Single Band Radio); 35 W (Multi-band radio)

Comply

D. Channel Spacing: 12.5/6.25 KHz/NPSPAC

Comply

E. Spurious/Harmonic: At least 64 dB below carrier

Comply

F. Frequency Stability: 1.5 PPM from -30°C to 60°C

Comply

G. Frequency Speed: 24MHz (700MHz)/18MHz (800MHz)

Comply

H. Emission: 16K0F3E; 11K0F3E; 8K10F1D; 8K10F1E; 9K80F1D, 9K80D7W or comparable Phase 2 Emission

Comply

I. Modulation Deviation: +/- 2.5KHz for 12.5KHz Channel; +/- 3KHz for NPSPAC

Comply

J. Audio Distortion: Less than 5% at 1KHz

Comply

K. Audio Response: +/-3dB of a 6dB/octave pre-emphasis characteristic from 300Hz to 3KHz

Comply

L. Hum and Noise: -45dB

Comply

M. Duty Cycle: Transmitter 20%

Comply

3.42.7.2 Receiver Specifications

A. Channel Spacing: 12.5KHz/6.25KHz; NPSPAC

Comply

B. 0.25 µV 5% Bit error Rate (BER)

Comply

C. Adjacent Channel: Rejection: -60dB

Comply

D. Frequency Stability: 1.5 PPM from -30° to 60°C

Comply

E. Frequency Spread: 24MHz (700MHz); 18MHz (800MHz)

Comply

F. Intermodulation: -75dB (Single band radio)

Comply

G. Rejection: -80dB (Multi band radio)

Comply

H. Spurious Response Rejection: -75dB (Single band radio) -80dB (Multi band radio)

Comply

I. Audio Output: 10 W (Single band radio), 12 W (Multi-band radio)

Comply

J. Audio Distortion: No more than 2% at 1KHz

Comply

K. Duty Cycle: Receiver 100%

Comply

3.42.8 Control Station Equipment Specifications

3.42.8.1 Power Specifications

A. Available either as an integrated 120VAC powered desktop radio rack or a remotely located, AC powered radio package with separate remote-control unit.

Comply

B. Primary Input Voltage: 120 VAC, 60 Hz, single-phase with 3-conductor grounded line cord.

Comply

C. Control station and control unit shall have an alternative provision to operate from standby 12VDC source upon failure of AC power.

Comply

D. Optional Battery: 12 VDC designed for 8 hrs. of operation

Comply

3.42.8.2 Control and Location Specifications

A. Alternatives shall be provided for local and remote-control operation of the control station.

Comply

*Attach Local and Remote-Control Option Documentation

Comply. See **Attachment 57 – 3.42.8.2.A Local and Remote-Control Option Documentation.**

B. All Control Stations proposed for interoperability solutions must be capable of a minimum of 16 channel/talkgroup steering through the base station gateway by a dispatch console.

Comply

C. Control station packaging shall incorporate sufficient electromagnetic shielding of radio and power supply components to allow multiple control stations to be located at the same site without causing unit-to-unit interference.

Comply

3.42.8.3 Electrical Specifications

A. Transmitter Specifications

1. Channel Spacing: 12.5/6.25 KHz, NPSPAC

Comply

2. RF Power Output: 18 W (700 MHz); 30 W (800 MHz)

Comply

3. RF Output Impedance: 50 ohms

Comply

4. Spurious/Harmonic: At least 70 dB below

Comply

5. Frequency Stability: 1.5 PPM from -25 °C to 60 °

Comply

6. Emission: 16K0F3E; 11K0F3E; 8K10F1D; 8K10F1E; 9K80F1D, 9K80D7W or comparable Phase 2 Emission

Comply

7. Modulation Deviation: +/-2.5KHz for 12.5KHz channel, +/-4 KHz NPSPAC

Comply

8. Audio Distortion: Less than 2% at 1 KHz

Comply

9. Audio Response: +/-3 dB of a 6 dB-per-octave pre-emphasis, characteristic, 300Hz to 3KHz

Comply

10. Duty Cycle: Transmitter 20-80% 12.4.3.1.11. Hum and Noise: -35dB

Comply

B. Receiver Specifications

1. Channel Spacing: 12.5/6.25 KHz/NPSPAC

Comply

2. Adjacent Channel Rejection: -63 dB

Comply

3. Digital Sensitivity: 5% BER: 0.35 µV

Comply

4. Frequency Stability: 1.5 PPM from -25 °C to 60 °C

Comply

5. Intermodulation Rejection: -75 dB

Comply

6. Spurious Response Rejection: -75 dB

Comply

7. Audio Output: Not less than 3W

Comply

8. Audio Distortion: No more than 2% at 1 KHz 12.4.3.2.9. Duty Cycle (EIA): Receiver 100%

Comply

3.42.9 Radio User Training

3.42.9.1 A comprehensive training program must be established by the Vendor in its Technical Submittal, to be implemented if selected as the Contractor.

Comply

A. This program would include not only user familiarization with physical features and functions of assigned radio equipment, but also instruction pertinent to the System's talkgroup structure and how the System's infrastructure establishes local, wide-area and outside interoperable call transactions.

Comply

3.42.9.2 The Contractor's training program must include the necessary graphics, visual simulations, and printed media tools to establish an appropriate training process for users.

Comply

A. Training videos must be available to users on a private web-based portal, thereby allowing for individual refresher training.

Comply

3.42.9.3 The Contractor must also supply technical assistance during the initial warranty period that allows for ongoing modifications to these training resources, to keep them in-step with additions and changes to the operable and interoperable resources within the System.

Comply

3.42.9.4 The Vendor shall provide a detailed description of its proposed user training program.

Comply

A. Examples of training tools developed for similar P25 regional trunked and conventional radio configurations shall be provided within the Vendor's Technical Proposal Submittal.

Comply

*Attach Training Description

Comply. See **Attachment 58 – 3.42.9.4.A Training Description.**

3.42.9.5 The Customer must approve all training curriculum prior to training.

Comply

3.42.9.6 The Vendor must provide resumes of professional training staff.

Comply

*Attach Training Staff Resumes

Comply. See **Attachment 59 – 3.42.9.6 Training Staff Resumes.**

3.42.9.7 The Vendor shall propose train-the-trainer subscriber training.

Comply

3.42.9.8 Any additional training for specialized radios and equipment including accessories or application-based radios must be provided by the vendor.

Comply

3.42.9.9 The Vendor shall provide training for the programming of all radios and features included in the Proposal.

Comply

3.43 Installation Guidelines

3.43.1 Contractor Project Management

3.43.1.1 Contractor will assign a Project Manager as a single point of contact between the Customer and the Contractor for the full duration of the project.

Comply

3.43.1.2 The Contractor's PM shall conduct an initial Design Review Meeting whereby the project's order of task progression, site/facility layout details, tower engineering studies, coverage design and related items will be presented to The Customer for review, comment and approval for the Contractor to proceed with production tasks.

Comply

3.43.1.3 During the period prior to the Design Review Meeting, the Contractor will initiate monthly progress meeting with the Customer whose purpose is to update on progress made in preparation for the Design Review Meeting.

Comply

3.43.1.4 The Contractor's PM is responsible for developing and maintaining an updated Project Timeline.

Comply

A. Project Timeline updates/revisions, commencing with the Customer's official Notice to Proceed to the Contractor, shall be submitted by the PM on the last day of each project-month for review and approval by the Customer.

Comply

B. The monthly Project Timeline submittal shall depict:

1. Progress made per task in the preceding 30-day period;

Comply

2. Work/tasks to be accomplished in the next 30-day period;

Comply

3. Identification of critical path items and;

Comply

4. Work/tasks to be undertaken by the Customer (if any).

Comply

C. Coincident with the production of the updated Project Timeline, the Contractor's PM shall identify any known or anticipated issues that will cause a delay to the project's implementation schedule that are not within the Contractor's control.

Comply

1. Failure by the Contractor's PM to identify such issues in advance will negate any opportunity for schedule relief to the Contract's specified Project Completion Date.

Comply

3.43.1.5 Failure by the Contractor to produce a monthly updated Project Timeline within the period specified herein will result in an automatic 7-day reduction of the Contract's specified Project Completion Date (or that Project Completion Date as previously modified by The Customer's executed Change Order if any.

Comply

3.43.1.6 Any change in PM, anytime during the full duration of the project, must be approved by the Customer and the new PM shall be selected by the Customer via an interview process.

Comply

3.43.1.7 The Contractor's Key Personnel shall be approved by the Customer prior to assignment. The Customer reserves the right to require replacement of the Contractor's Key Personnel at any time during the project.

Comply

3.43.2 Engineering Drawings

3.43.2.1 Contractor shall furnish detailed drawings at the project's initial Design Review Meeting and updated drawings prior to installation of each major portion of the System as follows:

Comply

A. Transmitter Site(s)

Comply

B. Receiver Site(s)

Comply

C. Site Antenna and Grounding System(s)

Comply

D. Receiver Voter Equipment

Comply

E. System Controller Equipment

Comply

F. Dispatcher Console Equipment

Comply

G. Fiber Optic Equipment Terminal(s)

Comply

3.43.2.2 Drawings shall, as a minimum, illustrate:

Comply

A. Relative rack/rack locations

Comply

B. Equipment power wiring (primary and emergency)

Comply

C. Equipment interconnection wiring (signal and control)

Comply

D. Appropriate signal/voltage levels to facilitate alignment of level-sensitive components.

Comply

3.43.2.3 Civil drawings showing location details of equipment to be placed in existing or new facilities shall be provided by Contractor.

Comply

3.43.2.4 Contractor shall provide a comprehensive test record of alignment levels, settings and software versions installed in System. In addition, contractor shall provide service manuals for all System equipment furnished.

Comply

3.43.2.5 In addition, the Contractor shall conduct baseline noise floor site measurements and shall develop, plan and resolve any determination of site/system-induced noise degradation as caused by the Contractor’s design or work.

Exceeds

Motorola has conducted a preliminary noise floor measurement. We are providing an initial baseline of noise floor measurements within the City taken during the RFP response period for our proposed frequency channels. A summary report is included in Section 3.13.3.3 of the proposal. Motorola will also conduct a detailed noise floor testing after contract execution.

3.43.2.6 The scope and detail of the comprehensive equipment test and acceptance plan shall be completed prior to Contract Execution with the Contractor.

Comply

3.43.2.7 Prior to the commencement of acceptance testing procedures, the Contractor shall ensure that all installed system equipment has been furnished or upgraded to the latest software releases available for those equipment items/groupings.

Comply

3.43.2.8 Contractor shall supply true copies of Final Project Record Documents, including the Engineering Drawings, software releases, and alignment details listed above, but amended to show system and equipment "as-built" at the time of acceptance by the Customer.

Comply

3.43.2.9 The documentation package shall include in this document submittal a Permissible Exposure Study, as required by the FCC, for each radio infrastructure site.

Comply

3.43.2.10 The total number of documentation sets to be provided shall include one site-specific set for each infrastructure site and three comprehensive System documentation sets for the Customer's use.

Comply

3.43.2.11 Final Project Record Documents must be submitted to the Customer within thirty days after system acceptance testing has been successfully concluded.

Comply

3.43.2.12 Submissions shall also include electronic versions of all documents submitted.

Comply

3.43.2.13 Final payment for Contracted services shall not be released by the Customer until this documentation submittal has been successfully completed by the Contractor and reviewed and approved by the Customer.

Comply

3.43.3 Workmanship

3.43.3.1 All workmanship shall be in accordance with Industry-accepted best practices and the National Electric Code.

Comply

3.43.3.2 Work areas shall be maintained in a neat, orderly fashion.

Comply

3.43.3.3 Work sites shall incorporate Contractor-provided trash containers and residue of the work shall be discarded as the work is underway.

Comply

3.43.3.4 All sites will be cleaned up at the end of each workday, swept clean, tools picked-up, and walkways free of obstacles and obstructions.

Comply

3.43.3.5 The installation of audio, signal, data and control cables within equipment racks, enclosures, racks and cable trays must be properly routed such that wires/cables do not cross over each within cable bundles.

Comply

3.43.3.6 Cables must be properly labeled, routed and secured.

Comply

3.43.3.7 To the maximum extent possible, cables carrying AC power, low-level audio, RF and digital signals must be grouped separately.

Comply

3.43.3.8 All DC wiring, particularly those areas where battery terminals and power distribution buss bars are located, must incorporate insulation barriers to prevent the accidental short-circuiting of otherwise exposed conductors.

Comply

3.43.3.9 The Customer shall have the ability to temporarily stop work progress by the Contractor if workmanship falls below acceptable levels and shall have the authority to require the Contractor to remove and/or correct all observed instances of poor wiring practice, inappropriate use of installation materials and other obvious installation defects because of apparently poor workmanship.

Comply

3.43.3.10 The Customer shall provide the Contractor with approval to resume installation work activities once an agreement is reached to resolve observed workmanship defects.

Comply

3.43.3.11 The determination of Contractor workmanship acceptability, as well as the suitability of any proposed rework plans offered by the Contractor, shall remain with the Customer.

Comply

3.43.4 Equipment Storage

3.43.4.1 The Contractor shall provide the necessary storage space and skilled labor needed to receive, inventory and maintain supplies and consumables throughout the term of the contract. Customer reserves the right to inspect and inventory equipment at any time.

Comply

3.43.5 Factory Staging

3.43.5.1 The Customer shall require a full factory staging of the Contractor’s radio configuration within the manufacturing facilities used by the Contractor.

Comply

A. The Contractor shall install, configure and conduct a pre-test of the manufactured equipment and subsystems prior to inviting the Customer to participate in functional test processes on the configured System’s equipment.

Comply

3.43.5.2 The Contractor shall provide a detailed description of functional tests to be undertaken as part of the factory staging process. These tests shall be pre-approved by the Customer prior to the conducting of any on-site system verification.

Comply

3.43.5.3 The factory staged equipment shall not be shipped to the Customer and the Contractor’s staging area until:

Comply

A. the most recent levels of software version have been properly installed in the system’s various components, and

Comply

B. all portions of the functional staging test have been successfully completed and approved by the Customer.

Comply

3.43.5.4 Wiring and construction anomalies, if observed during staging, must likewise be fully resolved and corrected prior to shipment of the equipment.

Comply

3.43.5.5 The Vendor shall, as part of its Technical Response, submit a sample staging test plan representing those functional tests anticipated for a project of this scope and complexity.

Comply

3.43.5.6 Staging shall occur for any RF and/or microwave equipment and shall not start until no less than 70% of the sites are constructed or under construction.

Comply

3.43.5.7 The Customer or its designee shall approve the date for staging of the equipment.

Comply

3.43.5.8 The Vendor is responsible for all travel and lodging costs associated with factory staging.

Comply

3.43.5.9 Travel and lodging shall be approved by the customer.

Comply

3.43.5.10 All equipment shall be of current revision and all software shall be of latest revision at the time of staging.

Comply

3.44 Phased Implementation

3.44.1 Transition Planning

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

3.44.1.1 As part of their response, the Vendor must prepare and submit a preliminary migration plan that will prevent disruption of communication on the existing radio network and provide a smooth transition to the proposed system:

Comply. See the information below.

Preliminary Migration Plan

Motorola Solutions has transitioned numerous hosted P25 simulcast trunking systems to P25 simulcast trunking system with customer owned ASTRO P25 Masters. Motorola carries that knowledge and experience forward in how we designed the City of Fort Lauderdale's system, site, and user group specific

migration. To transition from your existing Master Site hosted by Motorola's to our proposed P25 digital system, the City of Fort Lauderdale and Motorola Solutions will develop and agree upon a final system migration and transition plan.

This plan will enable the City of Fort Lauderdale's users to transition as smoothly as possible and without interruption onto the new system. We understand the importance of a successful cutover with minimal impact to the end users.

This document outlines the key components to be transitioned, identifies associated challenges, and presents recommended solutions. It serves as a roadmap, highlighting the critical aspects of the transition process. The final plan will be a result of joint collaboration involving Motorola Solutions, the City of Fort Lauderdale technical team, TUSA Consulting Services, and individual system users or their representatives.

The Cutover Plan will unfold in three phases:

- Phase I — Pre-Cutover Preparation**
- Phase II — Cutover Execution**
- Phase III — Post-Cutover**

Each phase is designed to ensure a comprehensive and well-coordinated transition experience for the City of Fort Lauderdale.

Phase I - Pre-Cutover Preparation

The pre-cutover phase is the most important phase. This is where all planning of the detailed cutover plan occurs for a successful cutover execution. The following outline establishes the starting point for cutover planning to aid the City of Fort Lauderdale and Motorola Solutions in crafting a viable cutover strategy. Careful up-front planning will require the City of Fort Lauderdale and Motorola Solutions to work closely with end users to minimize disruption.

Upon conclusion of the Contract Design Review phase of the project, the City of Fort Lauderdale and Motorola Solutions project team will commence activities to transform the following "Preliminary Cutover Plan Outline" into a comprehensive and detailed Cutover Plan complete with a timeline of events that will guide the collective actions leading up to, during, and following the actual transition from the existing radio system to the new ASTRO 25 System.

Preliminary Cutover Plan Outline

Motorola Solutions is proposing the installation of the new ASTRO 25 system in parallel with the existing legacy 800 MHz radio system. The proposed ASTRO 25 simulcast system will reuse a subset of the existing 800 MHz frequencies. This will result in short durations during the installation, optimization, and testing phases where existing operations may be impacted to a limited degree. The primary scenario of limited impact will include the temporary reduction in capacity at an existing site due to the need for disabling an existing channel to allow for optimization and testing activities on the new system. This is required to avoid interference between the two systems.

Prior to proceeding with any task that would impact day-to-day operations, Motorola Solutions will coordinate with the City of Fort Lauderdale to ensure the City, and their end users, are aware of the limitations, and agree to the impact to service along with procedures for reverting back to "normal" operation in the event of an emergency/public safety situation requires the limitations to be removed. At no time will

current operation be impacted without the City of Fort Lauderdale's knowledge and consent to proceed. Below is a detailed list of prerequisites, constraints, and assumptions that will need to be addressed during this cutover planning phase.

Cold Installation of the New System Infrastructure

The desired result of this phase is the installation of the new system alongside the legacy system, leaving the legacy system untouched.

The major steps of a cutover preparation include:

- Confirm site readiness
- Installation of new or upgrade of existing equipment shelters as described in the Civil Statement of Work of our response.
- Installation of new or upgrade of existing towers as described in the Civil Statement of Work of our response.
- Install/Optimize the new microwave equipment at all sites.
- Requires the completion of path surveys and FCC licensing.
- Install the ASTRO 25 Core site equipment (Primary and DSR).
- Install the Prime and Geo-Prime equipment.
- Install the RF site equipment including antennas and lines.
- Install the Dispatch site equipment.

The dispatch console subsystem consists of a compact workstation, and accessories, that can be temporarily installed at a staging location using minimal desk space until ready to cutover.

System Configuration Planning

The following activities will commence immediately following the completion of the contract design review and, in most cases, can be done in parallel with the cold installation tasks.

Licensing - Motorola Solutions will work with the City of Fort Lauderdale to relicense existing frequencies to operate in the new ASTRO 25 system sites. Per the RFP, Motorola Solutions has included engineering services to facilitate FCC licensing for the proposed frequencies. Allocation of number and frequency pair assignments of RF channels are dependent upon assignment by the FCC. Considerable pre-work has been done to identify suitable 800 MHz frequencies for licensing in this system. Initiating the process to relicense these frequencies for the new system will commence immediately subsequent to contract execution.

System Fleetmapping - Motorola Solutions will coordinate work sessions with the City of Fort Lauderdale to facilitate developing talkgroups and features that will be programmed into the various agencies' subscribers based on the end user needs. Once the fleetmap is approved by the City of Fort Lauderdale, Motorola Solutions will develop code plugs based on the fleetmap and use that to program the subscribers. The subscriber operation will be tested and verified by the City of Fort Lauderdale and the Motorola Solutions implementation team.

Dispatch Consoles - Motorola Solutions will coordinate with the City of Fort Lauderdale to assign talkgroups to the dispatchers and develop the console configurations. All new proposed dispatch consoles will be tested and all dispatch configurations and screen layouts approved by the City of Fort Lauderdale prior to cutover.

Interoperability - All interoperability analog interfaces will be tested by the City of Fort Lauderdale and Motorola Solutions implementation teams in addition to the legacy radio system wireless interfaces, if applicable.

Database Provisioning/Archiving - System databases will be loaded into the new ASTRO 25 system, tested and verified by the City of Fort Lauderdale and Motorola Solutions implementation teams.

System Optimization and Testing

The following activities will be completed upon completion of the equipment installation.

- Configure and Test all interfaces within the ASTRO 25 system
    - Simulcast Subsystem
    - Dispatch console sites
    - Primary – Master/Prime
    - Backup – Master/Prime (DSR/GeoPrime)
    - Primary Dispatch
    - Including IP Logging Recorder.
    - Backup Dispatch
    - Interoperability
    - Neighboring P25 networks
    - Conventional interfaces
    - Optimize RF subsystem
    - Perform System Testing
- Functional Testing - All Field Functional Testing will be performed and approved by the City of Fort Lauderdale
- Coverage Testing - Coverage test will be completed and accepted by the City of Fort Lauderdale.

Training

All required training will be performed prior to cutover. Please reference Section 12 for our training plan.

Additional Planning Considerations

Intra-System Scheduling Relationships (Radio/Dispatch/Logging) - A detailed schedule of events for the cutover will be developed jointly with the City of Fort Lauderdale and Motorola Solutions.

Inter-System Scheduling Relationships - This schedule will include details about other systems that the City of Fort Lauderdale will interface with via ISSI and Critical Connect/Wave including each system's readiness to connect and respective transport connectivity readiness.

Fallback Strategies/Contingency Plans - A detailed fallback plan will be developed jointly by the City of Fort Lauderdale and Motorola Solutions implementation team. This fallback plan will clearly identify the failures, causes and/or events that will activate the fallback plan, the backup subsystems to use and who in the City of Fort Lauderdale will have the ultimate responsibility to activate the fallback plan.

Dates/Timeframes to Avoid (Holidays, etc.) - The detailed timeline and schedule will avoid holidays or special events occurring in the City of Fort Lauderdale that impact agencies operations. It is desired to implement the cutover at a time and date of low traffic in the system to minimize the impact on the users.

Personnel/Staffing Requirements (City of Fort Lauderdale & Vendors) – The City of Fort Lauderdale will coordinate the staffing required for the dates of cutover as well as the different vendors required to be on site during the cutover. Motorola Solutions team will define the staffing required for the cutover at different sites and the dispatch center prior to the cutover. Short-Term & Long-Term Support Requirements - Once the transition to the new system is completed, the City of Fort Lauderdale and Motorola Solutions will determine how long the legacy system should be kept in operation to support any agency or radio users that have not made the transition to the new system after the cutover.

Deliverables

The ASTRO 25 infrastructure is installed, optimized, tested, and ready for use.

End users are trained and ready to transition to the new system.

Phase II - Cutover Execution

A high-level view of the cutover is outlined below in response to the City of Fort Lauderdale's RFP requirements.

Trunking Infrastructure

Motorola Solutions' response calls for a completely parallel implementation of the system. This will include complete installation of the new ASTRO 25 equipment at the proposed sites.

To facilitate an organized migration to the new infrastructure, a minimum of two channels will need to be enabled on the new ASTRO 25 infrastructure at the start of the migration. Since our proposal makes use of 6 inactive channels for which the City holds licenses, and only migrates 4 channels from the current P25 system, six channels can in fact be enabled at this stage without impact to the current system, instead of the minimum of two. This makes channel migration much simpler than in most systems we have migrated.

As additional users begin to use the new infrastructure, the four remaining channels will need to be enabled on the ASTRO 25 system and disabled on the legacy system on a planned schedule until all users have successfully migrated to the new system.

The City of Fort Lauderdale and Motorola Solutions implementation team will determine the proper sequence for transitioning the channels to the new infrastructure that will allow each agency to operate effectively on either system during the transition.

Agency Talkgroup Transition Approach

Since the new ASTRO 25 system is designed to include portable in-building coverage, once the new ASTRO 25 system has been fully tested, users can begin transitioning over to the new system using portable radios to allow additional flexibility for installing new mobile radios in the various end user vehicles.

The City of Fort Lauderdale and Motorola Solutions will collaborate on identifying groups of radios (“fleets” or “user groups”) that will be transitioned onto the new system and an appropriate time table for each group transition.

Radios in each user group will be identified and a determination will be made for each radio as to the appropriate procedure to transition it.

Once all groups have been identified and each radio classified, it will be necessary for the project team to choose the order, set a transition schedule, and create the detailed procedure for each group transition. Motorola Solutions will do the bulk of the work for this process but will require regular meetings with the City of Fort Lauderdale’s technical authorities to refine and approve each step.

City of Fort Lauderdale 911 Dispatch

The new dispatch console equipment will not be in the same locations as the existing console operator positions. However, the new dispatch positions will be installed to operate on the new system while the existing dispatchers continue to operate on the existing system. These new consoles will have direct access to the ASTRO 25 trunking resources and wireless access to a limited number of the City of Fort Lauderdale’s existing control station resources connected to Conventional Channel Gateway (CCGW) ports.

This assumes should any existing legacy control stations, operating on the legacy system be used, these stations will be pre-equipped with the ability to be controlled using standard analog 4W tone remote or E&M control. These control bases will be integrated to the Motorola Solutions dispatch network using conventional channel gateways. Once integrated to the dispatch network, they will be capable of being individually patched to a trunked talkgroup on the new ASTRO 25 network to provide basic audio interoperability between end users who have transitioned to the new ASTRO 25 system and end users waiting to transition and using the legacy system.

Because operating two console systems in parallel presents operational challenges, the City of Fort Lauderdale and Motorola Solutions will collaborate on a plan to minimize the time required to do so. This will require a detailed understanding of each operator’s responsibilities and how those responsibilities are affected by the

transitioning of the various subscriber groups. Each dispatcher will also be trained on accessing and using the wireless resources available to them from the new console and how to patch these resources between the two systems.

After all talkgroups have been migrated to the ASTRO 25 system, the legacy consoles can be turned off and decommissioned.

Logging Recorder

Motorola Solutions’ proposal includes a new IP logger that will be located at the primary Dispatch Center to record the ASTRO 25 system talkgroup audio. Motorola Solutions will work with the City of Fort Lauderdale to identify the talkgroups the City wishes to record. Once the new ASTRO 25 system enters into operation,

the talkgroups will be recorded on the IP logging recorder, and no additional action will be required other than to verify that the actual P25 system talkgroup traffic is being recorded.

The new IP logging recorder will be configured and tested prior to the official system cutover date.

Phase III – Post-Cutover

After the successful execution of the cutover plan, post-cutover activities will commence to remove the components that are no longer needed for the operations of the new system. The removal of these components will be executed with no disruption to operations of the new ASTRO 25 system.

These components include:

- Legacy backroom equipment and equipment racks
- Legacy subscriber equipment
- Legacy mobiles will be removed simultaneously with new mobile install
- Legacy RF equipment including antennas and coaxial cable

Removal and disposal of the legacy radio system equipment and RF site antenna systems replaced by ASTRO 25 proposed solution is included by Motorola Solutions, with the approval of the City of Fort Lauderdale.

Conclusion

Motorola Solutions has successfully migrated numerous customers over the years using many different technologies, limiting the impact to day-to-day operations. We look forward to doing the same with the City of Fort Lauderdale. Motorola Solutions' project team has the experience to meet and overcome any implementation challenges working collaboratively with the City of Fort Lauderdale to ensure a smooth cutover process is defined, and adjusted, throughout the entire deployment process.

Day Burn-in Period

Per each region, the 30-day burn-in period will commence upon the completion of the cutover phase so that the burn-in period is conducted under maximum system loading conditions. This 30-day burn-in is considered an additional form of acceptance testing governed by the occurrence of critical and/or minor failures during the 30- day period. The language below provides the preliminary construct of the 30-day burn-in test and incorporates the requirements set forth in the RFP.

Preliminary Parameters

The proposed test is designed to demonstrate the successful operation of the proposed ASTRO 25 system over a 30-day period following the transition of all users such that the system is evaluated under loading conditions that are considered "maximum." The 30-day duration is considered long enough to capture day-to-day operating conditions as well as extraordinary events representing peak loading conditions.

Motorola Solutions will work with the City of Fort Lauderdale to develop mutually agreed parameters governing this phase of the project, such as:

- Defining the Evaluation Period

- Defining Issues that are Considered Critical
- Identifying Critical Failures
- Testing/Verifying Critical Failures
- Re-starting the 30-day Period
- Defining Issues that are Considered Minor
- Successful Completion of the 30-Day Test

Evaluation Period

The evaluation period shall begin at 8:00 AM on the first calendar day following successful cutover of the final user agency, and shall run for a duration of 30 calendar days (excluding scheduled down time or maintenance). If at any time during the 30-day test period, the City of Fort Lauderdale feels that the system has met all requirements, and is operating to the City's complete satisfaction the test can be terminated and the project proceeds to the Final System Acceptance process.

Defining Critical Failures

A critical failure is defined as:

- Any failure which causes a loss of more than two talkpaths in the simulcast subsystem
- Any failure which causes a loss of one or more sites in the simulcast subsystem
- Any failure which causes complete loss of the primary core network
- Any failure which causes the loss of simulcast capability
- Any system failure that causes the loss of 25%, or more, console positions

All of the above faults will be considered critical failures provided they are due to the failure of Motorola Solutions provided equipment and not any City provided equipment or networks (if applicable).

Critical Failure Identification Procedure

If the City of Fort Lauderdale perceives a critical failure has occurred, the City has the responsibility for notifying Motorola within 12 hours of the failure. In addition, Motorola Solutions will actively monitor the system via the System Support Center during the 30-day burn-in period. Motorola Solutions will participate and facilitate the identification of critical failures.

Motorola Solutions and the City of Fort Lauderdale shall track and summarize all problem reports related to the system and determine if the critical failure was caused solely by Motorola provided equipment. Motorola will repair the system. Motorola will use the Critical Failure Testing Procedure, described below, to determine the nature of the failure. Collectively, Motorola and the City of Fort Lauderdale will characterize the event with formal documentation. Documentation shall include but is not limited to:

- Test start and stop dates and times
- Description of the outage or degradation

- Description of root cause and all corrective action taken to restore the system to service

Critical Failure Testing Procedure

Motorola Solutions will use proven troubleshooting and test equipment procedures as well as experienced personnel to isolate and verify the failure. Where applicable, Motorola Solutions will repeat portions of the previously executed Final Acceptance Test to determine and verify the critical nature of the failure. Once verified a Motorola Solutions responsibility to resolve, Motorola Solutions will implement repairs and correct the critical failure.

Re-starting the 30-day Period

In the event of a critical failure, the ongoing 30-day evaluation period will terminate. If a repair can't be made immediately, the City of Fort Lauderdale will be notified of the scheduled repair time and shall notify the City upon successful implementation of the repair. The City, in conjunction with Motorola Solutions, shall test the repairs to confirm operations of the system and certify the repair is complete. At the completion of the repair, the 30-day test shall re-start upon the following calendar day.

Minor Failures

The following failures are not considered critical failures and shall not cause a re-start of the 30-day test period:

- Failure of any single component that does not create a critical failure as defined above. For example, the failure of a redundant component.
- Communication outages or degradation to communications quality that are not attributable to the work performed or the materials provided by Motorola Solutions.
- The failure of the City provided subsystems or communications links (if applicable).

Should a minor failure occur, the 30-day period will be paused and will resume after resolution of the failure.

Successful Completion of the 30-Day Test Period

At the successful completion of the final phase 30-day period, Motorola Solutions and the City of Fort Lauderdale will execute a certificate of acceptance memorializing the completion of the test as input to the project close-out phase.

A. The Vendor must supply a preliminary sequence of events for the installation of the system showing any effect the different stages of installation may have on existing systems.

Comply. See the information provided in the previous section.

1. Any relocation or modification to existing equipment by the Contractor as part of its work must be stipulated and prior approval obtained from the Customer.

Comply

B. The Vendor shall provide a completion period (in days) for the project, based on the Customer's execution of a Notice to Proceed.

Comply

Provided on the following pages.

1. The Vendor shall provide a schematic representation of the implementation process as well as a hypothetical migration plan.

Comply

C. These required proposal responses will be used by the Customer to evaluate the Vendor's ability and understanding of the RFP requirements to perform this work in a manner that offers no disruption to ongoing public safety communications operations.

Comply

3.44.1.2 Upon contract award, the Contractor shall provide:

Comply

A. A detailed time schedule for the training of system managers, telecommunicators, radio managers and other personnel.

Comply

B. Contractor will supply time schedules for the orderly transfer of departments onto the system and the estimated time-period when the transfer could be completed.

Comply

C. A detailed repair maintenance training plan for the Customer's in-house technical staff members.

Comply

D. It shall encompass all operational elements of the System to include:

Comply

1. Network Controllers

Comply

2. Base Stations Gateways

Comply

3. Dispatch Consoles

Comply

4. Radio Control Stations, related appurtenances, and all third-party equipment.

Comply

5. This training shall be completed prior to the System's Acceptance Testing activity and is to be performed in the Customer's selected location.

Comply

a. Training locations and dates will be determined between the Customer and the Contractor.

Comply

6. All curriculums for the training plan must be approved by the Customer prior to the commencement of training.

Comply

a. The Contractor must provide training and identify necessary tools, to include test equipment and software, to the Customer's technical staff, as they would to their internal or contracted technical staff.

Comply

7. Coordinate the orderly transfer of services to the system network only after having successfully concluded equipment alignment and installation procedures, successful completion of the project's acceptance test, and completion of manager, telecommunicator, user, and staff training programs.

Comply

3.44.1.3 Contractor must not dismantle or modify the existing trunked radio system without prior approval of the Customer.

Comply

3.44.1.4 Some portions of the existing system may remain operational after acceptance of the new system.

Comply

3.44.1.5 The Customer will notify the Contractor when elements of the old infrastructure equipment may be reallocated to meet interoperability needs or otherwise can be decommissioned.

Comply

A. It is the Contractor's responsibility to remove or relocate all the old infrastructure equipment.

Comply

B. The Customer desires a trade in value on any existing equipment that is part of current communications system.

Comply

3.44.1.6 Contractor shall assist the Customer in preparing user talkgroups, initial priority levels and shall complete the necessary user equipment installation, programming and record keeping, as required. This activity must be completed prior to service cutover.

Comply

3.44.1.7 All talkgroup structure documentation will be provided to the Customer by the Contractor.

Comply

3.44.1.8 As part of contract negotiations with the successful Vendor, the Customer and successful Vendor will jointly develop a final comprehensive test and acceptance plan that addresses, minimally, the following major functionality and operability issues:

Comply

A. Microwave Network

1. Provide RF power and Receive measurements for the microwave;

Comply

2. Test path fade loss for each direction on each path of the microwave network;

Comply

3. Test for proper frequency, modulation, digital signaling and stability;

Comply

4. Verify data integrity on the microwave system including network components utilizing BER Testing.

Comply

B. Transmitter Equipment

1. Provide RF power stage measurements at different levels of the transmitter system such as transmitter, filters, combiner, cable, antenna, etc.;

Comply

2. Test RF components for specified insertion loss (i.e., transmission line return loss);

Comply

3. Test for proper frequency, modulation, digital signaling and stability;

Comply

4. Test and report of delivered audio quality and signal margins throughout proposed service area.

Comply

C. Receiver Equipment

1. Test of compliance to specifications of equipment provided;

Comply

2. Provide log of signal gain or loss to equipment within the receiver system such as antenna, cable, preamp, splitter, or receiver antenna port;

Comply

3. Test of audio quality and level (reciprocal of that required for the transmit path) of system balance;

Comply

D. Console Audio/ System Controllers

1. Test of compliance to manufacturer's published specifications of equipment proposed;

Comply

2. Test of audio quality and level;

Comply

3. Verification of network failure modes in response to forced failures of individual communications/ control lines and complete site failures complete written explanation is required;

Comply

4. Verification of compliance to TIA/EIA P25 ISSI/CSSI Standards that allow for seamless interoperability with P25 radio networks fielded by other manufacturers;

Comply

5. Bit error-rate and voiced audio quality testing of System infrastructure, backhaul and site-specific local area networking infrastructure;

Comply

6. Fade margin verification of microwave link segments as used to interconnect radio sites, network controllers and radio dispatch facilities;

Comply

E. Dispatch Centers

1. Provide written results of testing of operational features per dispatch position;

Comply

2. Test system operation during simulated failures of system components i.e. console electronics, power loss, etc.

Comply

F. Third Party Vendor Equipment

1. Provide functional testing and verification of any third-party equipment used;

Comply

G. Contractor shall provide all test equipment, diagnostic services, documentation, software, personnel, vehicles and other items as necessary to test the delivered and installed radio network in accordance with the Contracted Test and Acceptance Plan, inclusive of operational features, to complete a total system functional test.

Comply

H. The Vendor shall disclose test procedures and equipment that will be used to verify radio system coverage as specified in Section 3.13 Coverage Criteria.

Comply

I. The Vendor shall attach to their response a sample test and acceptance plan that is representative of the scope and complexity of the proposed system radio network infrastructure.

Comply

*Attach Sample Test and Acceptance Plan

Comply. See **Attachment 60 – 3.44.1.8.I Sample Test and Acceptance Plan.**

3.44.2 Implementation

3.44.2.1 Contractor is responsible for the provisions and cost of warehousing, insurance, storage and security of radio network infrastructure prior to and during the construction and installation phases of the project.

Comply

3.44.2.2 Prior to installation of any portion of system, the Customer must approve Contractor furnished detail drawings as specified in Section 3.43 Installation Guidelines.

Comply

3.44.2.3 Each portion of the P25 System must follow those technical parameters specified in the approved Testing and Acceptance Plan.

Comply

3.44.2.4 Contractor must supply comprehensive training for system diagnostics, management systems, preventative and routine maintenance and system operation for System Managers and designated Customer staff as required.

Comply

3.44.2.5 Contractor is responsible for any site modifications required to accommodate infrastructure equipment proposed for location in Customer-owned, as well as in non- Customer-owned properties.

Comply

Motorola Solutions conducted an inspection of the sites during the site walks. Our Site Development team gathered information and completed an initial feasibility analysis to identify the viability of reusing existing equipment rooms, shelters, rooftops and towers. Upgrades needed for the proposed sites are described in the Civil Statement of Work included in Section 3 of the Technical Response.

It is not possible to know if a tower can support a given load based only upon a visual inspection, without a detailed structural and foundation analysis. In compliance to RFP requirements, the Pricing Response shows estimated remediation cost per collocation tower site for the City to consider. Final civil and site costs will be determined during the Design Review process prior to implementation.

3.44.2.6 Contractor shall provide technical support/engineering as required to modify existing FCC licenses or to acquire additional licenses required to facilitate operation of the system.

Comply

3.44.2.7 This activity shall include all FCC licensing application development, frequency coordination and engineering fees. Any frequency work will be coordinated with the State of Florida Frequency Coordinator.

Comply

3.44.2.8 Any modification or relocation of existing equipment will require prior approval by Customer. Contractor shall supply "as built" drawings and complete written and electronic documentation of modifications or relocation to existing systems to facilitate maintenance of this equipment in the future.

Comply

3.44.2.9 The Contractor’s PM shall develop, monitor, and adapt/update the project’s implementation schedule. The schedule shall be presented using Microsoft Project. Schedule updates must be submitted by the Contractor weekly on days that are approved by the Customer, or sooner if implementation issues require more frequent schedule updates.

Comply

3.44.2.10 The Contractor’s PM shall, in addition to Item 3.45.2.9, prepare and submit, weekly on days approved by the Customer, a project status report that details the anticipated accomplishments, work to be completed and risks for the period depicted by the revised, updated schedule.

Comply

3.44.2.11 Specific attention should be made to those items and due dates to be met by the Customer to facilitate the unimpeded completion of the work.

Comply

3.44.2.12 The Contractor’s System Engineer shall develop and submit appropriate block and level diagrams, site-specific configuration drawings, field technician workbooks and other related technical materials necessary for the accurate, timely completion of the work.

Comply

A. The Contractor's PM shall present the Contractor's internal Quality Control/Quality Assurance plan that depicts the steps and safeguards being undertaken to eliminate field issues with respect to hardware and software quality.

Comply

B. This material and process shall be orally presented by the Contractor as part of its Design Review Meeting with the Customer, prior to the commencement of any field installation activities by the Contractor.

Comply

3.45 Warranty and Maintenance Guidelines

3.45.1 Warranty

3.45.1.1 Equipment Warranty

A. The following conditions shall apply for equipment Warranty:

Understood

1. The Vendor will provide post-warranty maintenance and services comparable to the same services proposed for the warranty period.

Comply

a. All warranty and post-warranty services will be clearly identified and provided in a matrix.

Comply

*Attach Warranty and Post-Warranty Matrix

Comply. See **Attachment 61 – 3.45.A.1.1.A1a – Warranty and Post-Warranty Matrix.**

b. All warranty and post-warranty services will cover the entire system, including Vendor provided OEM and third-party equipment.

Comply

1) These services will be priced individually for customer information.

Comply

c. The Customer can optionally remove any post-warranty services as determined by the Customer's need to provide in-house or subcontract any of these respective services.

Comply

2. The Vendor shall warranty all provided network equipment furnished as part of the Contract and associated radio infrastructure, related user equipment and software for not less than three years, after the date of Final System Acceptance.

Exceeds

Motorola will provide a five-year warranty.

d. This includes, but is not limited to, the P25 Trunking, Microwave, and Mutual- Aid portions of the Contract.

Comply

3. The System Warranty period will commence at the time of Final System Acceptance and the Contractor shall provide all labor and parts for maintenance and repair, including preventative maintenance, of all system equipment provided in the proposed network.

Comply

4. All costs for the three-year warranty services will be absorbed by the Contractor.

Comply

5. Replacement parts must be of new or current manufacture and meet or exceed the specifications of the original supplied equipment (OEM).

Comply

6. Post-warranty replacement parts service for emergency infrastructure equipment repair, not available locally, shall be shipped out on the first available flight. Any parts required for non-emergency repair that are not available locally should be shipped out for next day delivery.

Comply

7. The Contractor shall have factory-trained technicians and system engineers available by telephone 24x7x365.

Comply

e. The technicians or system engineers must respond by telephone within thirty (30) minutes of observed or reported service outage and be on-site, in response to a reported service outage, within two (2) hours.

Comply

f. Contractor shall be required to provide a list of certified factory-trained technicians performing maintenance on the system including all sub systems and equipment.

Comply

g. The Vendor shall provide documentation that supports the current certifications of factory-trained technicians.

Comply

1) The Vendor is responsible for keeping all credentials and certifications required to maintain the system current and up to date.

Comply

8. Service providers responding to emergency service outages must provide continuous non-stop support until the problem is resolved.

Comply

9. Non-critical service requests response will be within one (1) working day.

Comply

10. When a critical system failure occurs, more stringent requirements shall be met by the Contractor.

Comply

a. A critical system failure is defined as a significant reduction in the ability to communicate.

Understood

b. Examples of such failures are:

1) Site off the air,

Comply

Motorola will exert continuous effort to resolve critical failures.

2) Dispatch console failure at a location with no backup console available,

Comply

Motorola will exert continuous effort to resolve critical failures.

3) Primary and Secondary Network Controller failure such as the system does not have the ability to operate on trunked calls,

Comply

Motorola will exert continuous effort to resolve critical failures.

4) Site link failure due to network equipment,

Comply

5) Or 50% or more failed base/repeaters at a radio site.

Comply

Motorola will exert continuous effort to resolve critical failures.

6) Radio system not simulcasting.

Comply

11. In the event of a critical system failure, Contractor will notify The Customer of the failure.

Comply

12. Critical failures shall have service restored within six (6) hours or less from notification to the Contractor, via The Customer notifying the Contractor, or monitored software notification.

Comply with Clarification

Due to Motorola Solutions' robust design with redundant critical components, system operations can continue in the event of a critical component failure.

Motorola Solutions has proposed system spares and service response personnel to comply with this requirement, except in the case of a force majeure event. Motorola Solutions will endeavor to restore critical failures in less than 6 hours. Restoral repair times for the proposed system during a critical system failure will be based on a best continuous effort.

13. Original Equipment Manufacturers (OEM) shall have a fully qualified, staffed, and equipped service facility positioned and capable of meeting this RFP's response time criteria during the warranty and maintenance agreement periods.

Comply

a. Any subcontractors used during the warranty and post-warranty maintenance period must be pre-approved by the Customer.

Comply

B. The Vendor will supply as part of the technical response, a list or services and preventative maintenance to be provided during the warranty period as well as a schedule at which these services will occur.

Comply

Attachment 10 – 3.1.5.1 Ongoing Maintenance and Support Program Description and Timeline includes Motorola's proposed Warranty Maintenance program and matrix and description for all of Section 3.45 topics requested.

C. The Contractor must make available replacement parts for all Contractor- manufactured components of the digital radio infrastructure for 15 years following Final System Acceptance.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Comply

City of Fort Lauderdale must maintain active service and lifecycle agreement.

D. In the event any required part becomes unavailable during the specified fifteen (15) year period, the Contractor may provide a repaired or upgraded component, provided that:

1. The replacement maintains full functionality and interoperability with the existing system; and

2. The replacement cost does not exceed the cost of the original part had it remained commercially available.

The Contractor must identify lifecycle and parts availability of all OEM and third-party equipment proposed.

Comply

E. Post-warranty replacement parts service for emergency infrastructure equipment repair, not available locally, shall be shipped out on the first available flight.

Comply

F. Any parts required for non-emergency repair that are not available locally should be shipped out for next day delivery.

Comply

G. Contractor must guarantee the system's operating software, inclusive of user equipment software, for a one-year period following Final System Acceptance.

Comply

H. The Contractor shall provide all system software updates, at no additional cost, for the entire period under which The Customer has committed for Contractor-provided post-warranty maintenance services.

Comply

I. Contractor shall resolve all known software defects or "bugs" to system software during warranty and post-warranty period via patch, or system software updates.

Comply with Clarification

Motorola warrants that the unmodified software, when used properly and in accordance with the Documentation and this Agreement, will be free from a reproducible defect that eliminates the functionality or successful operation of a feature critical to the primary functionality or successful operation of the software. Whether a defect occurs will be determined by Motorola solely with reference to the documentation. Motorola does not warrant that Licensee's use of the Software or the Designated Products will be uninterrupted, error-free, completely free of Security Vulnerabilities, or that the software or the designated products will meet Licensee's particular requirements. Motorola makes no representations or warranties with respect to any third party software included in the Software. Notwithstanding, any warranty provided by a copyright owner in its standard license terms will flow through to Licensee for third party software provided by Motorola. Motorola's sole obligation to Licensee and Licensee's exclusive remedy under this warranty is to use reasonable efforts to remedy any material software defect covered by this warranty. These efforts will involve either replacing the media or attempting to correct significant, demonstrable program or documentation errors or Security Vulnerabilities. If Motorola cannot correct the defect within a reasonable time, then at Motorola's option, Motorola will replace the defective Software with functionally-equivalent Software, license to Licensee substitute Software which will accomplish the same objective, or terminate the license and refund the Licensee's paid license fee.

J. Prior to Final System Acceptance, System shall be updated to the latest system software release that is approved for shipping and generally available.

Comply

3.45.2 Remedies

3.45.2.1 In the event of default on the response time to reported service outages, the Vendor agrees to pay The Customer the following penalties for response remedies:

Comply with Clarification REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Motorola Solutions looks forward to working with the City to identify meaningful and mutually agreed remedy criteria that address these important requirements. If awarded, Motorola Solutions and City of Fort Lauderdale may discuss reasonable repair response times and remedies during negotiations.

A. Contractor shall pay $250 for each occasion that it fails to meet the response time obligation for a reported infrastructure service outage.

Comply with Clarification

Motorola complies to response times and shall make reasonable continuous effort to restore failed infrastructure sites. Failures that are outside of Motorola's reasonable control to remedy in 24 hours (such as but not limited to acts of God, negligent or intentional acts of man, etc...) shall be exempted.

B. Contractor shall pay $500 per twenty-four-hour period in which a failed infrastructure site is not restored to operational status.

Comply

Comply with clarification.

Motorola complies to response times and shall make reasonable continuous effort to restore failed infrastructure sites. Failures that are outside of Motorola's reasonable control to remedy in 24 hours (such as but not limited to acts of God, negligent or intentional acts of man, etc...) shall be exempted.

C. Should any specific equipment item (such as a repeater station, station circuit board, power amplifier, etc.) be submitted for repair three times during the warranty or post- warranty term, Contractor will replace that equipment item with a new item at no cost to the Customer and warranty the replacement for one additional year from the time of accepted replacement.

Comply

3.45.3 Maintenance

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

3.45.3.1 During the initial warranty period, the Contractor shall be responsible for:

A. Annual Preventative maintenance of all proposed System equipment and any supplied equipment;

Comply

B. Repair maintenance of infrastructure equipment, inclusive of antenna systems;

Comply with Clarification

Motorola Solutions complies with antenna system repair, including requisite tower crews on proposed new antenna systems are included during the warranty period, except in the case of force majeure events. Repair and restoration times cannot be guaranteed given that repairs generally require engaging a tower crew.

After the warranty period, repair maintenance, due to the variableness and unpredictability of events, is not included. These will be addressed per each occurrence basis. For critical site outages, Motorola Solutions commits to making continuous best efforts to affect a resolution to repair the impacted situation.

3.45.3.2 Updates of software, to include, but are not limited to; security updates, firmware updates and any new default features.

Comply

3.45.3.3 Contractor-provided maintenance during the warranty period will be monitored by the Customer.

Understood

3.45.3.4 The Contractor must supply monthly service logs listing the site(s) where service is performed, the equipment involved and service details.

Comply

City of Fort Lauderdale will be provided with access to Motorola's online MyView portal service tool as described in **Attachment 10 – 3.1.5.1 Ongoing Maintenance and Support Program Description and Timeline.**

3.45.3.5 Failure of individual units, subassemblies and/or components must be reported in writing to the Customer. This report must, as a minimum, include unit identification (description and serial number), explanation and cause of failure, and corrective action taken.

Comply

Motorola Solutions includes MyView Portal to provide the City of Fort Lauderdale self-service capabilities that can be useful in managing day-to-day support operations. MyView provides the City of Fort Lauderdale with “anytime, anywhere” visibility into critical support services information through a web browser interface. The MyView Portal dashboard displays a summary of open cases, open/recent repairs (aka Return Material Authorizations), cases breakdown by support service category, and recent orders. As the landing page when customers first log into MyView, this dashboard provides the City of Fort Lauderdale with a real-time, at-a-glance view to the services provided by Motorola Solutions.

MyView Portal is described in **Attachment 10 – 3.1.5.1 Ongoing Maintenance and Support Program Description and Timeline.**

3.45.3.6 Contractor is responsible for all actions of its employees or subcontractors. Any equipment failure(s) caused by any act or omission of Contractor's employee or subcontractor shall be the responsibility of the Contractor.

Comply

3.45.3.7 The Contractor shall submit a maintenance work plan that identifies the tasks required in accordance with Section 3.1, a listing of Contractor supplied personnel and identification of a 24x7x365 Single Point of Contact (SPOC) responsible for Contractor maintenance issues.

Comply

3.45.3.8 All required service logs and repair reports must be submitted to the Customer.

Comply

3.45.4 Service/Maintenance Software

3.45.4.1 The Contractor shall provide:

A. A suite of software applications for the Customer to be able to view and monitor all alarms and faults on the system, both non-critical and critical.

Comply

B. The contractor shall provide the Customer with access to an electronic ticketing system for the duration of the warranty and post-warranty maintenance term that gives the Contractor and the Customer the ability to submit and track service/repair tickets along with assets associated with the system.

Comply

Motorola Solutions offers Customer Hub. Supplementing the CSM and the Service Desk as the Customer points of contact, Customer Hub is a web-based platform that provides network maintenance and operations information. The portal is accessed from a desktop, laptop, tablet or smartphone web browser.

C. Software capable of decoding an encrypted control channel in real-time, over the air, should encrypted control channels be utilized at system acceptance, or a later time during the period of this contract.

Comply

If control channel encryption becomes a mandatory standard prior to System Acceptance, Motorola Solutions will provide the software for the City of Fort Lauderdale system once the software is developed by Motorola Solutions. If the such encryption becomes a mandatory standard after System Acceptance, Motorola Solutions may provide a separate cost to City of Fort Lauderdale to add the software.

D. As part of its cost submittal, the Vendor shall provide for optional maintenance services that are equivalent to those provided by the initial warranty. The term of each optional extended maintenance support option shall be five (5) years to be paid annually by the Customer.

Comply

E. The Customer reserves the right to utilize outside or outsourced contract labor for maintaining its infrastructure equipment and end user devices. For outside contractor needs, the term of this extended maintenance service shall be as long as fifteen years, structured into three 5-year optional service intervals. Vendors shall provide a detailed description of services (along with service exclusions) available for this extended post-warranty maintenance service, including infrastructure software updates, hardware updates required to support newer software, defective parts replacements, and spare parts.

Understood

F. Contractor shall propose optional cybersecurity services for the System, inclusive of network security monitoring service, system security patch subscription service, security patch installation service (on-site vs. remote), automated antivirus subscription & installation services available to the Customer. Including pricing options for warranty and post-warranty periods.

Comply

G. Contractor shall propose Network Monitoring services to provide 24x7x365 System surveillance and dispatch services of on-site field maintenance teams during the warranty period and the optional price to extend this service beyond warranty.

Comply

H. The Contractor will supply as part of the technical response, a list or services and preventative maintenance to be provided during the warranty period as well as a schedule at which these services will occur.

Comply

3.45.5 Spare Parts Support

3.45.5.1 Contractor must provide and maintain a stock of spare parts, as determined necessary by the Contractor, to maintain all components of the System's infrastructure for the warranty period. These spare parts shall be located either at selected System radio infrastructure sites or at the Contractor's local maintenance service facility. A list of these spare parts determined to be necessary by the Contractor shall be provided to the Customer.

Comply

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Motorola proposed a contingent of spares in our proposal. During negotiations, the spares list will be reviewed with City of Fort Lauderdale and if additional or listed optional spares are determined desired, the proposal and pricing will be augmented to include the additional spares. If a spare is consumed during the warranty or after-warranty maintenance period and the original product is non-repairable; the Customer shall purchase the new spare.

3.45.5.2 As spare parts are consumed during routine or repair maintenance, the Contractor shall immediately replenish its stock of locally housed spare parts, where necessary.

Comply

If a spare is consumed during the warranty or after-warranty maintenance period and the original product is non-repairable; the Customer shall purchase the new spare.

A. A report of the utilization frequency and rate of all spare materials shall be made available. If at any time the Contractor is aware of any equipment repair or recall notifications, the Contractor shall notify the Customer by electronic and routine mail.

Comply

B. Trends of unusual System or component failure shall be brought to the attention of the Customer by the Contractor.

Comply

3.45.5.3 If spares from the initial list are not available to maintain the proper working order of the proposed System, the Contractor shall add additional spares at no cost to the Customer.

Comply

3.45.5.4 The spares inventory will be supplied and shipped as part of the required staging event.

Comply

A. This applies to all spare parts recommended by the Contractor16. Infrastructure Pricing Considerations

Understood

3.45.6 General Pricing Information

3.45.6.1 This equipment-pricing portion of this RFP shall serve as a guide for the Vendor. The necessary information is provided to the Customer to conduct an accurate assessment of the proposed price. This information is illustrative of the detail required for each infrastructure site, inclusive of sites having only dispatch-related equipment.

Understood

3.45.6.2 Proposers shall provide a per-site granular price detail of proposed equipment, towers, generators, site civil engineering, program management, system engineering, installation services, and maintenance services.

Comply

*Attach Per-Site Granular Detail

Comply. See **Attachment 62 – 3.45.6.2 Per-Site Granular Detail.**

A. As this is a turnkey project, any pricing omission of a scope typically considered part of a P25 simulcast trunked radio system of this type will be provided for by the Contractor at no additional cost to the Customer.

Comply

For all references to turnkey, please refer to Motorola's system description, specifications and ATP in its proposal.

3.45.6.3 The Vendors are required to provide finance pricing options for the infrastructure, subscribers, and maintenance proposed.

Comply

A. This information should include at a minimum terms, interest percentages, and payment terms.

Comply

3.45.8 Site Modification Costs

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

3.45.8.1 For equipment to be installed at the Customer-owned sites which have requirements for site preparatory work involving architectural, mechanical, electrical, civil or structural construction modifications, a description and cost of the modifications required must be provided by the Vendor for each individually named site.

Comply

Motorola's proposed design includes RFP compliant civil work. Motorola has conducted the site walks and based on that, we have come up with the necessary costs per site for all the work that needs to be conducted. The civil scope of work included in this proposal is included in **Attachment 9 – 3.1.4.5 Information About Service and Support.**

3.45.8.2 Vendors who fail to identify sites subject to this requirement shall, at their own expense and without entitlement to a change order, perform all necessary modifications to achieve compliance with this specification.

Comply with Clarification

Any modifications not identified by Motorola will be subject to a mutually agreed-upon solution between The City and Motorola. See Attachment 9 for sites identified by Motorola for this project.

3.45.8.3 For newly-added sites, the price provided by the Vendor shall include services typical and customary for the development and commissioning of a new system site, exclusive of access roadway development.

Comply

A. The Customer will provide site access roadways if the property is the Customer-owned.

Understood

3.45.9 Lifecycle Costs

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

3.45.9.1 The Customer reserves the right to perform a lifecycle analysis on the proposed system to determine the best price value.

Understood

A. A critical part of such research involves knowledge of the overall lifecycle of the various OEM and 3rd Party elements making up a Vendor’s System solution.

Understood

B. From general availability to manufacture discontinue and all phases in between, the production age of the proposed system affects the ability to source spare parts, software upgrade, and support services.

Understood

C. Lifecycle analysis is a critical factor in determining the operational life of the proposed P25 technology and supporting products.

Understood

3.45.9.2 Vendors shall disclose key lifecycle dates of the proposed system, including subscribers, P25 System software, infrastructure, network elements, and 3rd Party supporting equipment. Include general availability (GA) release dates to manufacture discontinue (MD) dates along with important OEM hardware and software support dates for standard, extended and out-of-support milestone dates. Please detail how software support dates/phases affect service availability and pricing.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Comply

All equipment provided in this proposal is of current design and production and end of life has not been determined.
Once a product's end of life has been identified, Motorola will inform the City of the upcoming cancellation. Motorola will use commercially reasonable efforts to provide replacement parts for Motorola manufactured subscriber equipment for five (5) years and for Motorola manufactured fixed infrastructure equipment exclusive of third party IT equipment (e.g. servers, pc's) for seven (7) years, both from the last date of manufacture. Motorola reserves the right to supply either assemblies or piece parts.

Motorola's ASTRO Support Policy is attached.

3.45.9.3 Vendors shall disclose as part of their Cost Proposal when System was first released for sale to the Public.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Comply

Motorola will provide a life-cycle roadmap upon receipt of Non-Disclosure Agreement.

All equipment provided in this proposal is of current design and production and end of life has not been determined. Once a product's end of life has been identified, Motorola will inform the City of the upcoming cancellation. Motorola will use commercially reasonable efforts to provide replacement parts for Motorola manufactured subscriber equipment for five (5) years and for Motorola manufactured fixed infrastructure equipment exclusive of third party IT equipment (e.g. servers, pc's) for seven (7) years, both from the last date of manufacture. Motorola reserves the right to supply either assemblies or piece parts.No proposed Motorola or OEM or third party equipment has a determined end of life, manufacturer discontinue, or end of support date.

Motorola's ASTRO system was created in 1991.

In 2011, Motorola deployed ASTRO 25 systems with P25 Time Division Multiple Access (TDMA) trunking to double the voice capacity of Frequency Division Multiple Access (FDMA) technology. The P25 Phase 2 products were the first in the industry. ASTRO 25 is a land mobile radio (LMR) platform that was built to comply with the Project 25 (P25) standard.

3.45.9.4 Vendors shall also provide a life-cycle roadmap, referenced by year and so depict when any third-party equipment is likely to be discontinued and when parts/software support will cease to be available.

Comply

3.45.10 Warranty and Post-Warranty Maintenance Costs

3.45.10.1 Costs for the initial warranty and extended post-warranty maintenance service, inclusive of infrastructure software updates, hardware updates required to support newer software, defective/failed parts replacements, and spare parts, shall be included as part of the Vendor's cost proposal. Multi-year pricing shall be detailed by the Customer fiscal year (October 1, through September 30).

Comply

3.45.10.2 The Vendor shall provide detailed pricing for all system support services proposed under the post-warranty maintenance timeframe.

Comply

3.45.10.3 Post-warranty maintenance services will replicate all services available during the warranty year period, to include all third-party equipment proposed.

Comply

3.45.10.4 The Vendor will provide post-warranty system services as an extended warranty service from the start of post warranty to 20-years.

Comply

3.45.10.5 The Vendor will provide post-warranty depot services as an annual price from the start of warranty through 20-years.

Comply

3.45.11 Pricing Summaries

A. All summary information will be supported by detailed cost information as detailed further in this Section.

Understood

3.45.11.2 Pricing Summaries shall include;

A. Infrastructure Equipment

Comply

B. Project Management, Engineering, & Installation Services

Comply

C. Subscriber radios with options and accessories

Comply

D. Subscriber Programming and Installation Services

Comply

E. Infrastructure Discount

Comply

F. Subscriber Discount

Comply

G. Turnkey Discount

Comply

H. System Maintenance (annual basis, after warranty expiration)

Comply

I. Subscriber Maintenance (annual basis, after warranty expiration)

Comply

J. Total Cost of Ownership at 5, 10, 15 and 20 years (Provide comprehensive breakdown, attached to Section VI: Cost Proposal Page.)

Comply

3.45.11.3 Optional Requests Future Purchase Considerations

Comply

A. The Customer intends to operate this new radio communications network for, minimally, the next twenty years. Therefore, the Customer must receive reasonable safeguards regarding future Vendor equipment and maintenance services pricing to establish a total long-term cost of ownership.

Comply

B. Include with Cost Proposal Page annual price increase amounts for equipment and maintenance services.

Comply

3.45.12 Immediate Future Discounts

3.45.12.1 For all purchases within five (5) years after the System's acceptance date, the discount percentage received by the Customer will be identical to the discount percentages derived from list-price unit equipment costs and Vendor-submitted unit costs as designated in 3.45.10 I.

Comply

3.45.13 Purchase Price Discount Years 6 – 10

3.45.13.1 For years six (6) through ten (10) after the System's acceptance date,

Comply

3.45.13.2 The Customer’s discount from the manufacturer's published equipment list price, as delivered to their authorized sales agents, shall be as follows:

Comply

A. Fixed Site Equipment

Comply

B. Antenna Related Equipment

Comply

C. Console Equipment

Comply

D. Control Station Equipment

Comply

E. Spare Parts

Comply

F. Managed & Support Services

Comply

3.45.14 Price Discount Years 11 – 15

3.45.14.1 For years eleven (11) through fifteen (15) after the System’s final acceptance date, The Customer’ discount from the manufacturer's published equipment list price as delivered to their authorized sales agents, shall be as follows:

Comply

A. Fixed Site Equipment

Comply

B. Antenna Related Equipment

Comply

C. Console Equipment

Comply

D. Control Station Equipment

Comply

E. Spare Parts

Comply

F. Managed & Support Services

Comply

3.45.15 Price Discount Years 16 – 20

3.45.15.1 For years sixteen (16) through twenty (20) after the System's acceptance date, The Customer's discount from the manufacturer's published equipment list price as delivered to their authorized sales agents, shall be as follows:

Comply

A. Fixed Site Equipment

Comply

B. Antenna Related Equipment

Comply

C. Microwave Equipment

Comply

D. Console Equipment

Comply

E. Network Equipment

Comply

F. Control Station Equipment

Comply

G. Spare Parts

Comply

H. Managed & Support Services

Comply

3.45.16 Infrastructure Pricing Analysis Worksheets

3.45.16.1 The vendor shall provide pricing worksheets to develop the Infrastructure Price Submittal. These worksheets are indicative of the detail required and may be amended or expanded by the Vendor as necessary. These worksheets shall be provided as part of the bid submittal in Microsoft Excel format.

Comply

3.45.16.2 Any omission or error in developing the pricing proposal, shall be the sole responsibility of the Contractor.

Comply

3.45.16.3 The City reserves the right to ask for additional pricing detail in the pricing worksheets at any time during contract negotiations or any time prior to final acceptance.

Comply

3.46 Additional Requirements

3.46.1 Fire/EMS Paging System: Not required for this RFP

3.46.2 Alternative Shared System Infrastructure

3.46.2.1 The Customer is sensitive to the costly nature of P25 systems. Therefore, vendors are encouraged to submit creative additional proposals that may utilize any or all capabilities, software, and hardware of other systems that are already being provided by the vendor. This may include systems that are currently under construction but can be modified to accommodate additional equipment added for the purposes of this RFP, or systems that are complete and in normal operation (Further referenced as “existing system”).

Understood

3.46.2.2 Alternative system configuration technical requirements.

Comply

A. Alternative configurations must have redundant network connection points into the existing system.

Comply

1. Additionally, the proposed optional configuration must be able to continue regular trunking operations and communications in the event of network connectivity failure to the existing system.

Comply

2. This includes dispatch consoles having direct network access into the remaining RF sites, or RF connectivity.

Comply

B. Alternative configurations must have redundant network connection points into the existing system.

Comply

1. Additionally, the proposed optional configuration must be able to continue regular trunking operations and communications in the event of network connectivity failure to the existing system.

Comply

2. This includes dispatch consoles having direct network access into the remaining RF sites, or RF connectivity.

Comply

C. Alternative System Configuration Pricing Requirements:

1. Within the pricing proposal of the alternative system configuration, key cost differences (whether savings or additional cost) shall be identified and marked as such for comparison purposes.

Comply

2. An example of this is if a specific item is needed in a stand-alone system, but already exists with the alternative solution, the vendor shall highlight this cost savings.

Comply

a. Within the pricing proposal of the alternative system configuration, key cost differences (whether savings or additional cost) shall be identified and marked as such for comparison purposes.

Comply

b. An example of this is if a specific item is needed in a stand-alone system, but already exists with the alternative solution, the vendor shall highlight this cost savings.

Comply

D. Alternative System Configuration Submittal Requirements:

1. Any alternative system configuration proposal must follow all dates and guidelines as prescribed in this RFP, including the separation of its pricing from the technical proposal.

Comply

2. Additionally, any alternative system configuration that requires joining an existing system or site, must include written authorization from the owner of the existing system or site.

Comply

Motorola is not proposing an alternate system configuration that requires joining an existing system or site; therefore, no written authorization is necessary.

3. This authorization must be included within the technical proposal submittal for the alternative system configuration.

Comply

Motorola is not proposing an alternate system configuration that requires joining an existing system or site; therefore, no written authorization is necessary.

E. Additional Connectivity:

1. Any additional connectivity required by Commercial type service (fiber, etc.) to meet any redundancy requirements must be clearly identified in the proposal with costs listed as an alternative.

Comply



Section 4. SECTION IV – SUBMITTAL REQUIREMENTS

4.1 Instructions

4.1.1 The City of Fort Lauderdale uses its own on-line strategic sourcing platform to administer the competitive solicitation process, including but not limited to soliciting proposals, issuing addenda, responding to questions / requests for information. There is no charge to register and download the RFP from the City's on-line strategic sourcing platform. Proposers are strongly encouraged to read the supplier tutorial available in the City's on-line strategic sourcing platform well in advance of their intention of submitting a proposal to ensure familiarity with the use of the City's on-line strategic sourcing platform. The City shall not be responsible for a Proposer's inability to submit a proposal by the end date and time for any reason, including issues arising from the use of the City's on-line strategic sourcing platform.

Understood

4.1.2 Careful attention must be given to all requested items contained in this RFP. Proposers are invited to submit proposals in accordance with the requirements of this RFP. Please read entire solicitation before submitting a proposal. Proposers must provide a response to each requirement of the RFP. Proposals should be prepared in a concise manner with an emphasis on completeness and clarity. Notes, exceptions, and comments may be rendered on an attachment, provided the same format of this RFP text is followed.

Comply

4.1.3 All information submitted by Proposer shall be typewritten or provided as otherwise instructed to in the RFP. Proposers shall use and submit any applicable or required forms provided by the City and attach such to their proposal. Failure to use the forms may cause the proposal to be rejected and deemed non-responsive.

Comply

IN THE EVENT OF ANY CONFLICT OR DISCREPANCY BETWEEN BID/PROPOSAL PRICE(S) SUBMITTED BY BIDDER/PROPOSER ELECTRONICALLY INTO THE CITY'S ON-LINE STRATEGIC SOURCING PLATFORM UNIT PRICE FIELD(S), ANY OTHER FORMS OR ATTACHMENTS (WHETHER PART OF THE CITY'S SOLICITATION DOCUMENTS OR DOCUMENTS CREATED AND UPLOADED BY THE BIDDER/PROPOSER), OR ANOTHER SECTION/FIELD OF THE SYSTEM, THE ONLINE UNIT PRICE(S) INPUTTED ELECTRONICALLY INTO THE SYSTEM BY BIDDER/PROPOSER SHALL GOVERN.

Comply

4.1.4 Proposals shall be submitted by an authorized representative of the firm. Proposals must be submitted in the business entities name by the President, Partner, Officer or Representative authorized to contractually bind the business entity. Proposals shall include an attachment evidencing that the individual submitting the proposal, does in fact have the required authority stated herein.

Comply

4.1.5 All proposals will become the property of the City. The Proposer's response to the RFP is a public record pursuant to Florida law, which is subject to disclosure by the City under the State of Florida Public Records Law, Florida Statutes Chapter 119.07 ("Public Records Law"). The City shall permit public access to all documents, papers, letters, or other material submitted in connection with this RFP and the Contract to be executed for this RFP, subject to the provisions of Chapter 119.07 of the Florida Statutes. Any language contained in the Proposer's response to the RFP purporting to require confidentiality of any portion of the Proposer's response to the RFP, except to the extent that certain information is in the City's opinion a Trade Secret pursuant to Florida law, shall be void. If a Proposer submits any documents or other information to the City which the Proposer claims is Trade Secret information and exempt from Florida Statutes Chapter 119.07 ("Public Records Laws"), the Proposer shall clearly designate that it is a Trade Secret and that it is asserting that the document or information is exempt. The Proposer must specifically identify the exemption being claimed under Florida Statutes 119.07. The City shall be the final arbiter of whether any information contained in the Proposer's response to the RFP constitutes a Trade Secret. The city's determination of whether an exemption applies shall be final, and the Proposer agrees to defend, indemnify, and hold harmless the city and the city's officers, employees, and agent, against any loss or damages incurred by any person or entity as a result of the city's treatment of records as public records. In the event of Contract award, all documentation produced as part of the Contract shall become the exclusive property of the City.

Comply

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT PRRCONTRACT@FORTLAUDERDALE.GOV, 954-828-5002, CITY CLERK'S OFFICE, ONE EAST BROWARD BOULEVARD, SUITE 444, FORT LAUDERDALE, FLORIDA 33301.

Understood

Contractor shall:

1. Keep and maintain public records required by the City in order to perform the service.

Understood

2. Upon request from the City's custodian of public records, provide the City with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes (2024), as may be amended or revised, or as otherwise provided by law.

Comply

3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of this contract if the Contractor does not transfer the records to the City.

Comply

4. Upon completion of the Contract, transfer, at no cost, to the City all public records in possession of the Contractor or keep and maintain public records required by the City to perform the service. If the Contractor transfers all public records to the City upon completion of this Contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of this Contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records, in a format that is compatible with the information technology systems of the City.

Comply

4.1.6 By submitting a response Proposer is confirming that the firm has not been placed on the convicted vendors list as described in Section §287.133 (2) (a) Florida Statutes; that the only person(s), company or parties interested in the proposal as principals are named therein; that the proposal is made without collusion with any other person(s), company or parties submitting a proposal; that it is in all respects fair and in good faith, without collusion or fraud; and that the signer of the proposal has full authority to bind the firm.

Comply

4.2 Contents of the Proposal

The City deems certain documentation and information important in the determination of responsiveness and for the purpose of evaluating proposals. Proposals should seek to avoid information in excess of that requested, must be concise, and must specifically address the issues of this RFP. The City prefers that proposals be no more than 100 pages in one complete pdf document. The proposals should be organized, divided, and indexed into the sections indicated herein. These are not inclusive of all the information that may be necessary to properly evaluate the proposal and meet the requirements of the scope of work and/or specifications. Additional documents and information should be provided as deemed appropriate by the respondent in proposal to specific requirements stated herein or through the RFP.

Comply

4.2.1 Table of Contents

The table of contents should outline in sequential order the major areas of the submittal, including enclosures. All pages should be consecutively numbered and correspond to the Table of Contents.

Comply

4.2.2 Executive Summary

Each Offeror must submit an executive summary that identifies the business entity, its background, main office(s), and office location that will service this contract. Identify the officers, principals, supervisory staff, and key individuals who will be directly involved with the work and their office locations. The executive summary should also summarize the key elements of the proposal.

Comply

4.2.3 Experience and Qualifications

Indicate the firm's number of years of experience in providing the professional services as it relates the work contemplated. Provide details of past projects for agencies of similar size and scope, including information on your firm's ability to meet time and budget requirements. Indicate the firm's initiatives towards its own sustainable business practices that demonstrate a commitment to conservation. Indicate business structure, IE: Corp., Partnership, LLC. Firm should be registered as a legal entity in the State of Florida; Minority or Woman owned Business (if applicable); Company address, phone number, fax number, E-Mail address, web site, contact person(s), etc. Relative size of the firm, including management, technical and support staff; licenses and any other pertinent information shall be submitted.

Comply

4.2.4 Approach to Scope of Work

Provide in concise narrative form your understanding of the City's needs, goals and objectives as they relate to the project, and your overall approach to accomplishing the project. Give an overview on your proposed vision, ideas, and methodology. Describe your proposed approach to the project.

Comply

As a part of the response, a design plan and diagram(s) shall be presented to the City for approval.

Comply

The Proposer shall also propose a scheduling methodology (timeline) for effectively managing and executing the work in the optimum time. The delivery time shall be stated in calendar days from the date of City notification of award or notice to proceed with delivery. Such timeline information and proposed dates shall include, but not necessarily be limited to: delivery, installation, acceptance testing, personnel, and other related completion dates, in accordance with the RFP specifications.

Comply

NOTE: The project must be completed and accepted within 120 days from the City Notice to Proceed.

Comply

Motorola will complete the CDR within the required timeline.

Also provide information on your firm's current workload and how this project will fit into your workload. Describe available facilities, technological capabilities, and other available resources you offer for the project.

Understood

Additionally, the proposal should specifically address:

A. Who

Comply

B. What

Comply

C. When

Comply

D. Where

Comply

E. Why

Comply

F. How

Comply

4.2.5 References

Provide at least three references, preferably government agencies, for projects with similar scope as listed in this RFP. Information should include:

Comply

• Client Name, address, contact person telephone and E-mail addresses.

• Description of work.

• Year the project was completed.

• Total cost of the project, estimated and actual.

Note: Do not include City of Fort Lauderdale work or staff as references to demonstrate your capabilities. The Committee is interested in work experience and references other than the City of Fort Lauderdale.

Comply. See references below.

Reference	Broward County
Address	1801 NW 64th Street Suite #106A • Fort Lauderdale • FL • 33309
Contact Person	José M. De Zayas
Contact Title	E911 Communications Administrator
Contact Department	Regional Emergency Services and Communications, Communications and Technology
System Responsibility	The Broward County P25 ORCT (Office of Regional Communications and Technology) Radio System provides mission-critical communications services primarily to public safety

Reference	Broward County
	agencies throughout Broward County, Florida. This includes: • 31 municipalities within Broward County. • 22 Law Enforcement and Fire Rescue agencies. • Five Public Safety Answering Points (PSAPs), including those participating in the Regional Consolidated E-911 Call Taking/Dispatch System, as well as independent PSAPs like Coral Springs and Plantation that participate in the E-911 Wireline/Wireless Program. • The Broward Sheriff's Office (BSO), including their Department of Detention (DOD), Department of Law Enforcement (DLE), and Fire Rescue (FR), and all contract cities dispatched by BSO. Interoperable partners, which can include state and federal agencies.
Phone	954.770.8410
Email	JDEZAYAS@broward.org
Detailed System Summary	• 700/800MHz P25 system. • 16 site 20 channel • Phase 2 TDMA • Motorola Subscriber Radios (APX, APX NEXT, APX N70) • ISSI • SMARTCONNECT • PremierOne CAD - SMARTINCIDENT
Narrative Description	16 site P25 buildout (2017), including Microwave, consoles, and green site development throughout the county. Recent upgrades include AXS consoles (from MCC 7500) and replaced all logging recorders.

Reference	Alachua County
Address	911 SE 5th ST • Gainesville • FL • 32601
Contact Person	Harold Theus
Contact Title	Fire Chief
Contact Department	Fire Rescue
System Responsibility	Alachua County provides integrated radio communitions for the majority of public safety agencies in the conty including Gainsville, High Springs, La Crosse, Archer, Waldo, Micanopy, Newberry, Hawthorne and the University of Florida Police Department.
Phone	352-327-2166
Email	hmt@AlachuaCounty.us

Reference	Alachua County
Detailed System Summary	• 700/800MHz P25 system. • 6 site 13 channel • Phase 1 FDMA • Motorola Subscriber Radios (APX NEXT) • MCC7500 Dispatch Consoles • ISSI • RAVE
Narrative Description	Motorola provided a complete solution for Alachua County P25 System that includes a 6 site, 13-channel, trunked simulcast ASTRO 25 (P25 Phase 1) system utilizing Motorola Solutions' G-Series (GTR 8000 Base Radio) equipment at its simulcast sub-sites,

Reference	Clay County
Address	2519 State Road 16W • Greeen Cove Springs • FL • 32043
Contact Person	Dean Hane, PMP
Contact Title	Director
Contact Department	Management Information Systems
System Responsibility	County owned radio system, Green Coast Springs, Orange Park fire and PD all utilize the system.
Phone	904-529-2764
Email	dean.hane@claycountygov.com
Detailed System Summary	• 800MHz P25 system. • 6 site 5 channel • Phase 1 FDMA • Motorola Subscriber Radios • MCC 7500 Consoles
Narrative Description	Motorola completed a P25 system in 2016 with cutover in 2018, and have had multiple upgrade over various phases that included towers, shelters, Radios, Microwave and MPLS. The system had multiple cutovers for each phase of the overall project.

Reference	Nassau County
Address	96135 Nassau Place • Yulee • FL • 32097
Contact Person	Derrick Lindsay
Contact Title	CIO
Contact Department	Management Information Systems
System Responsibility	Nassau County BOCC, System Manager Users include Nassau SO, Nassau Firt, Ferdininda beach fire and rescue, city of ferdanina police department. ~900+ users
Phone	904-530-6051
Email	dlindsay@nassaucountyfl.com

Reference	Nassau County
Detailed System Summary	• 800MHz P25 system. • 6 site 9 channel • Phase 2 TDMA • Motorola Subsciber Radios (APX & APX N70) • MCC7500E Consoles
Narrative Description	P25 system buildout, added consoles since original system upgrade. Currently in process of upgrading system to include Virtual Prime site and geo-redudent prime site.

4.2.6 Minority/Women (M/WBE) Participation

If your firm is a certified minority business enterprise as defined by the Florida Small and Minority Business Assistance Act of 1985, provide copies of your certification(s). If your firm is not a certified M/WBE, describe your company's previous efforts, as well as planned efforts in meeting M/WBE procurement goals under Florida Statutes 287.09451.

Comply

Motorola is not a certified M/WBE contractor. However, Motorola's subcontractor SBP consulting who will be conducting the CATP tests is a Minority owned business.

4.2.7 Subcontractors

Proposer must clearly identify any subcontractors that may be utilized during the term of this contract.

Comply

4.2.8 Required Forms

A. Proposal Certification

Complete and attach the Proposal Certification provided herein.

Comply. See **Exhibit B – RFP Section 4.2.8 Required Forms.**

B. Non-Collusion Statement

This form is to be completed, if applicable, and inserted in this section.

Comply. See **Exhibit B – RFP Section 4.2.8 Required Forms.**

C. E-Verify Affirmation Statement

This form is to be completed and returned with your proposal.

Comply. See **Exhibit B – RFP Section 4.2.8 Required Forms.**

D. Pricing Sheets as Separate Attachment

Provide firm, fixed, costs for all services/products using the Excel document provided in this request for proposal. These firm fixed costs for the project include any costs for travel and miscellaneous expenses. No other costs will be accepted.

Comply. See **Exhibit B – RFP Section 4.2.8 Required Forms.**

E. Sample Insurance Certificate

Demonstrate your firm's ability to comply with insurance requirements. Provide a previous certificate or other evidence listing the Insurance Companies names for the required coverage and limits.

Comply. See **Exhibit B – RFP Section 4.2.8 Required Forms.**

F. W-9 for Proposing Firm

This form must be completed and returned with your proposal.

Comply. See **Exhibit B – RFP Section 4.2.8 Required Forms.**

G. Active Status Page from Division of Corporations – Sunbiz.org

Provide PDF of current page with your proposal.

Comply. See **Exhibit B – RFP Section 4.2.8 Required Forms.**



Section 5. SECTION V – EVALUATION AND AWARD

5.1 Evaluation Procedure

5.1.1 Bid/Proposal Tabulations/Intent to Award

Notice of Intent to Award Contract/Bid/Proposal, resulting from the City's Formal solicitation process, requiring City Commission action, may be found at: https://www.fortlauderdale.gov/government/departments-a-h/finance/procurement- services/notices-of-intent-to-award. Tabulations of receipt of those parties responding to a formal solicitation may be found at: https://www.fortlauderdale.gov/government/departments-a-h/finance/procurement-services/bid-results, or any interested party may call the Procurement Services Division at 954-828-5933.

Understood

5.1.2 Evaluation of proposals will be conducted by an Evaluation Committee, consisting of a minimum of three members of City Staff, or other persons selected by the City Manager or designee. All committee members must be in attendance at scheduled evaluation meetings. Proposals shall be evaluated based upon the information and references contained in the responses as submitted.

Understood

5.1.3 The Committee may short list Proposals that it deems best satisfy the weighted criteria set forth herein. The committee may then conduct interviews and/or require oral presentations from the short-listed Proposers. The Evaluation Committee shall then re-score and re-rank the short-listed firms in accordance with the weighted criteria.

Comply

5.1.4 The City may require visits to the Proposer's facilities to inspect record keeping procedures, staff, facilities and equipment as part of the evaluation process.

Understood

5.1.5 The final ranking and the Evaluation Committee's recommendation may then be reported to the City Manager for consideration of contract award.

Understood

5.2 Evaluation Criteria

5.2.1 The City uses a mathematical formula to determine the scoring for each individual responsive and responsible firm based on the weighted criteria stated herein. Each evaluation committee member will rank each firm by criteria, giving their first ranked firm a number 1, the second ranked firm a number 2, and so on. The City shall multiply that average ranking by the weighted criterion identified herein to determine the total the points for each Proposer. The lowest average final ranking score will determine the recommendation by the evaluation committee to the City Manager.

Understood

5.2.2 Weighted Criteria

Understands the Scope of the Project | 10%

References, Past Performance, Years in Business | 5%

Technical Merits of the Project, Flexibility of Technology Proposed, Quality of Proposed Equipment | 15%

Hardening and Redundancy | 20%

Performance and Radio Coverage | 20%

Total Project Cost | 30%

TOTAL PERCENT AVAILABLE: | 100%

Comply

5.3 Proposal Evaluation

An evaluation committee of qualified City staff and or other persons selected by the City will conduct evaluation of proposals.

Understood.

5.3.1 Contractors' technical proposals and supporting materials shall have no pricing, cost breakdowns, or rates included in this portion of their proposal.

Comply.

A. Noncompliance will render their submission non-responsive.

Understood.

5.3.2 All pricing is to be submitted in the provided Excel Pricing Worksheets as a separate attachment.

Comply.

A. Noncompliance will render their submission non-responsive.

Understood.

5.4 Contract Award

The City reserves the right to award a contract to that Consultant who will best serve the interest of the City. The City reserves the right, based upon its deliberations and in its opinion, to accept or reject any or all proposals. The City also reserves the right to waive minor irregularities or variations of the submittal requirements and RFP process.

Understood



Section 6. SECTION VI - COST PROPOSAL PAGE

Proposer Name:

Motorola Solutions, Inc.

Proposer agrees to supply the products and services at the prices proposed in accordance with the terms, conditions and specifications contained in this RFP.

Comply.

Cost to the City: Contractor shall quote firm, fixed, costs for all services/products identified in this request for proposal. These firm fixed costs for the project include any costs for travel and miscellaneous expenses. No other costs will be accepted.

Motorola's response includes firm fixed pricing for the identified scope for the initial term. Pricing is subject to renegotiation for any renewal term.

See attached Excel document 358 – Pricing Worksheet Template to provide the comprehensive breakdown of costs including but not limited to labor, equipment, materials, parts, and maintenance.

Comply. See **Attachment 62 – 3.45.6.2 Per-Site Granular Detail**.



Section 7. APPENDICIES A - F

Appendix A: Current Infrastructure

Voice System

Fort Lauderdale currently utilizes a P25 800 MHz Trunking Radio System that is hosted, owned, and operated by Motorola Solutions. This system is utilized by Fort Lauderdale Fire-Rescue, Fort Lauderdale Police, Fort Lauderdale Public Works, Oakland Park Local Government, Oakland Park Police, and Wilton Manors Police. This system is also utilized by Coral Springs, FL and Plantation, FL, however, these jurisdictions are not included in this RFP.

Understood

Back-haul

Current system backhaul is licensed microwave which connects each site to the Motorola Solutions hosted core. Backhaul is currently a ring configuration connecting Playa del Sol Site to the microwave only Pompano Site; the Pompano Site connects to the Utilities site; the Utilities site connects to the current PD HQ Site (planned to connect to the Greenfield SLERS co-location site); the Greenfield SLERS co-location site is planned to connect to the Playa del Sol Site; the Ring is connected to the hosted core from the Utilities Site. Microwave traffic will be re-routed to delete the Pompano Site, while maintaining an overall ring topography.

Understood

Existing Towers

Currently, Fort Lauderdale utilizes three (3) towers for Radio Frequency voice coverage. These sites are:

Understood

A. Playa del Sol Site: (26°10'17.5"N 80°05'54.5"W)

Understood

B. Equipment room located on the 29th floor

Understood

C. Known grounding issues

Understood

D. Microwave Backhaul

Understood

E. Insufficient UPS for desired backup power

Understood

F. Utilities Site: (26°10'35.6"N 80°09'25.1"W)

Understood

G. On City Public Works property

Understood

H. Known grounding issues

Understood

I. Planned Co-location with Greenfield SLERS Site: (26°07'25.6"N 80°10'20.0"W)

Understood

J. Not completed as of the release of this RFP

Understood

K. Details provided as available

Understood

Consoles

Fort Lauderdale is currently dispatched by Broward County dispatch and is connected via an ISSI. Fort Lauderdale plans to add back-up consoles at the EOC and Fort Lauderdale Police Headquarters as part of this RFP.

Understood

Subscriber Radios

A. Fort Lauderdale uses a combination of Motorola Mobile and Portable radios.

Understood

B. APX Mobiles/Portables

Understood

C. XTS Portables

Understood

D. XTL Mobiles

Understood

Fire Paging

No fire paging is utilized by Fort Lauderdale.

Understood

Appendix B: Existing Channel Structure – Frequencies and Talkgroups

[Table Frequencies]

Understood

[Table Talkgroups]

Understood

Appendix C: Tower Candidate Sites List

The three (3) existing RF Voice sites are all candidates for future use in the proposed new system.

Understood

Additionally, Fort Lauderdale desires the use of the Point of America Site: (26°05'47.6"N 80°06'26.0"W)

Comply

Other options will be considered as proposed and evaluated for best value.

Understood

Appendix D: Critical Building List

[Table Critical Buildings]

Comply

Appendix E: FCC Licenses

[See Pages to Follow]

Understood

Appendix F: Network Management Requirements

This section provides additional requirements for the management and integration with the City's network.

Understood

OPTION 1: VENDOR MANAGED NETWORK

1.1. Radio vendor after reserving needed bandwidth will provide to the City an unmanaged RJ45 or Fiber connection to install our own routers and switches at each tower location. All remaining bandwidth will be consumed as the City's discretion.

Comply

1.2. All egress points into the City's production data networks require firewall or approved access control list for routing that must be approved by

Comply

1.3. All deployed vendor hardware and software well not be using the default login credentials from the manufacture and must use unique passwords. Passwords will use the minimum following criteria.

Comply

1.3.1 At least 12 characters—the more characters, the better.

Comply

1.3.2 A mixture of both uppercase and lowercase letters.

Comply

1.3.3 A mixture of letters and numbers.

Comply

1.3.4 Inclusion of at least one special character, e.g., ! @ # ?]

Comply

1.4 Any remote access into the radio systems by devices such as computers, tablets, phones or any other devices will use VPN encryption when possible. Multifactor authentication is strongly recommended.

Comply

1.5 The Customer will perform a network penetration test looking for security vulnerabilities after the vendor has indicated the build out is complete and ready for production use. The vendor designed and implemented network must pass security review meaning any reasonable vulnerabilities closed and latest security patches applied to any software

Comply

1.6 Vendor will provide all security login credentials to the City for all equipment and software services configured for the radio system.

Comply

1.7 All router and switch configurations will be provided to be reviewed by the City but not managed by Broward County.

Comply

1.8 Any changes to firewall rules or access control list configurations will be Section G - Network Management Req reviewed and approved by Broward County prior to implementation.

Comply

OPTION 2: CITY MANAGED NETWORK

2.1 City will use either EIGRP or OSPF for ring routing collapse protocol based on vendor requirements.

Understood

2.4 City will provide vendor dedicated isolated VLAN and IP address allocations. All deployed vendor hardware and software will not be using the default login credentials from the manufacture and must use unique passwords. Passwords will use the minimum following criteria.

Comply

2.4.1 At least 12 characters—the more characters, the better.

Comply

2.4.2 A mixture of both uppercase and lowercase letters.

Comply

2.4.3 A mixture of letters and numbers.

Comply

2.4.4 Inclusion of at least one special character, e.g., ! @ # ?]

Comply

2.5 All egress points into the City's production data networks require firewall or approved access control list for routing and must be approved by

Comply

2.6 Vendor will provide all security login credentials to the City for all equipment and software services configured for the radio system.

Comply

2.7 Any remote access into the radio systems by devices such as computers, tablets, phones or any other devices will use VPN encryption when possible. Multifactor authentication is strongly recommended.

Comply

Appendix G: Subscriber Radio List

[Table Portable and Mobile Radios]

Understood

Appendix H: Interoperability Needs

Fort Lauderdale requires interoperability by ISSI to the following:

Comply

A. SLERS (State of Florida)

Comply

B. Broward County

Comply

C. Motorola HMS

Comply

D. An open, spare pathway for future use

Comply



Section 8. CITY OF FORT LAUDERDALE GENERAL CONDITIONS

These instructions and conditions are standard for all contracts for commodities or services issued through the City of Fort Lauderdale Procurement Services Division. The City may delete, supersede, or modify any of these standard instructions for a particular contract by indicating such change in the Invitation to Bid (ITB) Special Conditions, Technical Specifications, Instructions, Proposal Pages, Addenda, and Legal Advertisement. In this general conditions document, Invitation to Bid (ITB), Request for Qualifications (RFQ), and Request for Proposal (RFP) are interchangeable.

Comply

PART I BIDDER PROPOSAL PAGE(S) CONDITIONS:

1.01 BIDDER ADDRESS: The City maintains automated vendor address lists that have been generated for each specific Commodity Class item through our bid issuing service, BidSync. Notices of Invitations to Bid (ITB'S) are sent by e-mail to the selection of bidders who have fully registered with BidSync or faxed (if applicable) to every vendor on those lists, who may then view the bid documents online. Bidders who have been informed of a bid's availability in any other manner are responsible for registering with BidSync in order to view the bid documents. There is no fee for doing so. If you wish bid notifications be provided to another e-mail address or fax, please contact BidSync. If you wish purchase orders sent to a different address, please so indicate in your bid response. If you wish payments sent to a different address, please so indicate on your invoice.

Understood

1.02 DELIVERY: Time will be of the essence for any orders placed as a result of this ITB. The City reserves the right to cancel any orders, or part thereof, without obligation if delivery is not made in accordance with the schedule specified by the Bidder and accepted by the City.

Understood

1.03 PACKING SLIPS: It will be the responsibility of the awarded Contractor, to attach all packing slips to the OUTSIDE of each shipment. Packing slips must provide a detailed description of what is to be received and reference the City of Fort Lauderdale purchase order number that is associated with the shipment. Failure to provide a detailed packing slip attached to the outside of shipment may result in refusal of shipment at Contractor's expense.

Comply

1.04 PAYMENT TERMS AND CASH DISCOUNTS: Payment terms, unless otherwise stated in this ITB, will be considered to be net 45 days after the date of satisfactory delivery at the place of acceptance and receipt of correct invoice at the office specified, whichever occurs last. Bidder may offer cash discounts for prompt payment but they will not be considered in determination of award. If a Bidder offers a discount, it is understood that the discount time will be computed from the date of satisfactory delivery, at the place of acceptance, and receipt of correct invoice, at the office specified, whichever occurs last.

Understood

1.05 TOTAL BID DISCOUNT: If Bidder offers a discount for award of all items listed in the bid, such discount shall be deducted from the total of the firm net unit prices bid and shall be considered in tabulation and award of bid.

Understood

1.06 BIDS FIRM FOR ACCEPTANCE: Bidder warrants, by virtue of bidding, that the bid and the prices quoted in the bid will be firm for acceptance by the City for a period of one hundred twenty (120) days from the date of bid opening unless otherwise stated in the ITB.

Comply

1.07 VARIANCES: For purposes of bid evaluation, Bidder's must indicate any variances, no matter how slight, from ITB General Conditions, Special Conditions, Specifications or Addenda in the space provided in the ITB. No variations or exceptions by a Bidder will be considered or deemed a part of the bid submitted unless such variances or exceptions are listed in the bid and referenced in the space provided on the bidder proposal pages. If variances are not stated, or referenced as required, it will be assumed that the product or service fully complies with the City's terms, conditions, and specifications.

Comply

By receiving a bid, City does not necessarily accept any variances contained in the bid. All variances submitted are subject to review and approval by the City. If any bid contains material variances that, in the City's sole opinion, make that bid conditional in nature, the City reserves the right to reject the bid or part of the bid that is declared by the City as conditional.

Understood

This requirement should be mutual with respect to the vendor's acceptance of the City's position regarding its terms and conditions.

1.08 NO BIDS: If you do not intend to bid please indicate the reason, such as insufficient time to respond, do not offer product or service, unable to meet specifications, schedule would not permit, or any other reason, in the space provided in this ITB. Failure to bid or return no bid comments prior to the bid due and opening date and time, indicated in this ITB, may result in your firm being deleted from our Bidder's registration list for the Commodity Class Item requested in this ITB.

Understood

1.09 MINORITY AND WOMEN BUSINESS ENTERPRISE PARTICIPATION AND BUSINESS DEFINITIONS: The City of Fort Lauderdale wants to increase the participation of Minority Business Enterprises (MBE), Women Business Enterprises (WBE), and Small Business Enterprises (SBE) in its procurement activities. If your firm qualifies in accordance with the below definitions please indicate in the space provided in this ITB.

Understood

Minority Business Enterprise (MBE) "A Minority Business" is a business enterprise that is owned or controlled by one or more socially or economically disadvantaged persons. Such disadvantage may arise from cultural, racial, chronic economic circumstances or background or other similar cause. Such persons include, but are not limited to: Blacks, Hispanics, Asian Americans, and Native Americans.

Understood

The term "Minority Business Enterprise" means a business at least 51 percent of which is owned by minority group members or, in the case of a publicly owned business, at least 51 percent of the stock of which is owned by minority group members. For the purpose of the preceding sentence, minority group members are citizens of the United States who include, but are not limited to: Blacks, Hispanics, Asian Americans, and Native Americans.

Understood

Women Business Enterprise (WBE) a “Women Owned or Controlled Business” is a business enterprise at least 51 percent of which is owned by females or, in the case of a publicly owned business, at least 51 percent of the stock of which is owned by females.

Understood

Small Business Enterprise (SBE) “Small Business” means a corporation, partnership, sole proprietorship, or other legal entity formed for the purpose of making a profit, which is independently owned and operated, has either fewer than 100 employees or less than $1,000,000 in annual gross receipts.

Understood

BLACK, which includes persons having origins in any of the Black racial groups of Africa.

Understood

WHITE, which includes persons whose origins are Anglo-Saxon and Europeans and persons of Indo-European decent including Pakistani and East Indian.

Understood

HISPANIC, which includes persons of Mexican, Puerto Rican, Cuban, Central and South American, or other Spanish culture or origin, regardless of race.

Understood

NATIVE AMERICAN, which includes persons whose origins are American Indians, Eskimos, Aleuts, or Native Hawaiians.

Understood

ASIAN AMERICAN, which includes persons having origin in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands.

Understood

1.10 MINORITY-WOMEN BUSINESS ENTERPRISE PARTICIPATION

It is the desire of the City of Fort Lauderdale to increase the participation of minority (MBE) and women-owned (WBE) businesses in its contracting and procurement programs. While the City does not have any preference or set aside programs in place, it is committed to a policy of equitable participation for these firms. Proposers are requested to include in their proposals a narrative describing their past accomplishments and intended actions in this area. If proposers are considering minority or women owned enterprise participation in their proposal, those firms, and their specific duties have to be identified in the proposal. If a proposer is considered for award, he or she will be asked to meet with City staff so that the intended MBE/WBE participation can be formalized and included in the subsequent contract.

Understood

1.11 SCRUTINIZED COMPANIES

As a condition precedent to the effectiveness of this Agreement, subject to Odebrecht Construction, Inc., v. Prasad, 876 F.Supp.2d 1305 (S.D. Fla. 2012), affirmed, Odebrecht Construction, Inc., v. Secretary, Florida Department of Transportation, 715 F.3d 1268 (11th Cir. 2013), with regard to the "Cuba Amendment," the Contractor certifies that it is not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, and that it does not have business operations in Cuba or Syria, as provided in section 287.135, Florida Statutes (2023), as may be amended or revised. As a condition precedent to any contract for goods or services of any amount and as a condition precedent to the renewal of any contract for goods or services of any amount, the Contractor certifies that it is not on the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2023), and that it is not engaged in a boycott of Israel. The City may terminate this Agreement at the City's option if the Contractor is found to have submitted a false certification as provided under subsection (5) of section 287.135, Florida Statutes (2023), as may be amended or revised, or been placed on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2023), as may be amended or revised, or is engaged in a boycott of Israel, or has been engaged in business operations in Cuba or Syria, as defined in Section 287.135, Florida Statutes (2023), as may be amended or revised.

Comply

1.12 DEBARRED OR SUSPENDED BIDDERS OR PROPOSERS

The bidder or proposer certifies, by submission of a response to this solicitation, that neither it nor its principals and subcontractors are presently debarred or suspended by any Federal department or agency.

Comply

Part II DEFINITIONS/ORDER OF PRECEDENCE:

2.01 BIDDING DEFINITIONS The City will use the following definitions in its general conditions, special conditions, technical specifications, instructions to bidders, addenda and any other document used in the bidding process:

Understood

INVITATION TO BID (ITB) The solicitation document used for soliciting competitive sealed bids for goods or services.

Understood

INVITATION TO NEGOTIATE (ITN) All solicitation documents, regardless of medium, whether attached to or incorporated by reference in solicitations for responses from firms that invite proposals from interested and qualified firms so the city may enter into negotiations with the firm(s) determined most capable of providing the required goods or services.

Understood

REQUEST FOR PROPOSALS (RFP) A solicitation method used for soliciting competitive sealed proposals to determine the best value among proposals for goods or services for which price may not be the prevailing factor in award of the contract, or the scope of work, specifications or contract terms and conditions may be difficult to define. Such solicitation will consider the qualifications of the proposers along with evaluation of each proposal using identified and generally weighted evaluation criteria. RFPs may include price criteria whenever feasible, at the discretion of the city.

Understood

REQUEST FOR QUALIFICATIONS (RFQ) A solicitation method used for requesting statements of qualifications in order to determine the most qualified proposer for professional services.

Understood

BID – a price and terms quote received in response to an ITB.

Understood

PROPOSAL – a proposal received in response to an RFP.

Understood

BIDDER – Person or firm submitting a Bid.

Understood

PROPOSER – Person or firm submitting a Proposal.

Understood

RESPONSIVE BIDDER – A firm who has submitted a bid, offer, quote, or response which conforms in all material respects to the competitive solicitation document and all of its requirements.

Understood

RESPONSIBLE BIDDER – A firm who is fully capable of meeting all requirements of the solicitation and subsequent contract. The respondent must possess the full capability, including financial and technical, ability, business judgment, experience, qualifications, facilities, equipment, integrity, capability, and reliability, in all respects to perform fully the contract requirements and assure good faith performance as determined by the city.

Comply

FIRST RANKED PROPOSER – That Proposer, responding to a City RFP, whose Proposal is deemed by the City, the most advantageous to the City after applying the evaluation criteria contained in the RFP.

Understood

SELLER – Successful Bidder or Proposer who is awarded a Purchase Order or Contract to provide goods or services to the City.

Understood

CONTRACTOR – Any firm having a contract with the city. Also referred to as a "Vendor".

Understood

CONTRACT – All types of agreements, including purchase orders, for procurement of supplies, services, and construction, regardless of what these agreements may be called.

Understood

CONSULTANT – A firm providing professional services for the city.

Understood

2.02 SPECIAL CONDITIONS: Any and all Special Conditions contained in this ITB that may be in variance or conflict with these General Conditions shall have precedence over these General Conditions. If no changes or deletions to General Conditions are made in the Special Conditions, then the General Conditions shall prevail in their entirety,

Understood

PART III BIDDING AND AWARD PROCEDURES:

3.01 SUBMISSION AND RECEIPT OF BIDS: To receive consideration, bids must be received prior to the bid opening date and time. Unless otherwise specified, Bidders should use the proposal forms provided by the City. These forms may be duplicated, but failure to use the forms may cause the bid to be rejected. Any erasures or corrections on the bid must be made in ink and initialed by Bidder in ink. All information submitted by the Bidder shall be printed, typewritten, or filled in with pen and ink. Bids shall be signed in ink. Separate bids must be submitted for each ITB issued by the City in separate sealed envelopes properly marked. When a particular ITB or RFP requires multiple copies of bids or proposals they may be included in a single envelope or package properly sealed and identified. Only send bids via facsimile transmission (FAX) if the ITB specifically states that bids sent via FAX will be considered. If such a statement is not included in the ITB, bids sent via FAX will be rejected. Bids will be publicly opened in the Procurement Office, or other designated area, in the presence of Bidders, the public, and City staff. Bidders and the public are invited and encouraged to attend bid openings. Bids will be tabulated and made available for review by Bidder's and the public in accordance with applicable regulations.

Comply

3.02 MODEL NUMBER CORRECTIONS: If the model number for the make specified in this ITB is incorrect, or no longer available and replaced with an updated model with new specifications, the Bidder shall enter the correct model number on the bidder proposal page. In the case of an updated model with new specifications, Bidder shall provide adequate information to allow the City to determine if the model bid meets the City's requirements.

Understood

3.03 PRICES QUOTED: Deduct trade discounts and quote firm net prices. Give both unit price and extended total. In the case of a discrepancy in computing the amount of the bid, the unit price quoted will govern. All prices quoted shall be F.O.B. destination, freight prepaid (Bidder pays and bears freight charges, Bidder owns goods in transit and files any claims), unless otherwise stated in Special Conditions. Each item must be bid separately. No attempt shall be made to tie any item or items contained in the ITB with any other business with the City.

Comply

3.04 TAXES: The City of Fort Lauderdale is exempt from Federal Excise and Florida Sales taxes on direct purchase of tangible property. Exemption number for EIN is 59-6000319, and State Sales tax exemption number is 85-8013875578C-1.

Understood

3.05 WARRANTIES OF USAGE: Any quantities listed in this ITB as estimated or projected are provided for tabulation and information purposes only. No warranty or guarantee of quantities is given or implied. It is understood that the Contractor will furnish the City's needs as they arise.

Comply

3.06 APPROVED EQUAL: When the technical specifications call for a brand name, manufacturer, make, model, or vendor catalog number with acceptance of APPROVED EQUAL, it shall be for the purpose of establishing a level of quality and features desired and acceptable to the City. In such cases, the City will be receptive to any unit that would be considered by qualified City personnel as an approved equal. In that the specified make and model represent a level of quality and features desired by the City, the Bidder must state clearly in the bid any variance from those specifications. It is the Bidder's responsibility to provide adequate information, in the bid, to enable the City to ensure that the bid meets the required criteria. If adequate information is not submitted with the bid, it may be rejected. The City will be the sole judge in determining if the item bid qualifies as an approved equal.

Comply

3.07 MINIMUM AND MANDATORY TECHNICAL SPECIFICATIONS: The technical specifications may include items that are considered minimum, mandatory, or required. If any Bidder is unable to meet or exceed these items, and feels that the technical specifications are overly restrictive, the bidder must notify the Procurement Services Division immediately. Such notification must be received by the Procurement Services Division prior to the deadline contained in the ITB, for questions of a material nature, or prior to five (5) days before bid due and open date, whichever occurs first. If no such notification is received prior to that deadline, the City will consider the technical specifications to be acceptable to all bidders.

Comply

3.08 MISTAKES: Bidders are cautioned to examine all terms, conditions, specifications, drawings, exhibits, addenda, delivery instructions and special conditions pertaining to the ITB. Failure of the Bidder to examine all pertinent documents shall not entitle the bidder to any relief from the conditions imposed in the contract.

Understood

3.09 SAMPLES AND DEMONSTRATIONS: Samples or inspection of product may be requested to determine suitability. Unless otherwise specified in Special Conditions, samples shall be requested after the date of bid opening, and if requested should be received by the City within seven (7) working days of request. Samples, when requested, must be furnished free of expense to the City and if not used in testing or destroyed, will upon request of the Bidder, be returned within thirty (30) days of bid award at Bidder's expense. When required, the City may request full demonstrations of units prior to award. When such demonstrations are requested, the Bidder shall respond promptly and arrange a demonstration at a convenient location. Failure to provide samples or demonstrations as specified by the City may result in rejection of a bid.

Comply

3.10 LIFE CYCLE COSTING: If so specified in the ITB, the City may elect to evaluate equipment proposed on the basis of total cost of ownership. In using Life Cycle Costing, factors such as the following may be considered: estimated useful life, maintenance costs, cost of supplies, labor intensity, energy usage, environmental impact, and residual value. The City reserves the right to use those or other applicable criteria, in its sole opinion that will most accurately estimate total cost of use and ownership.

Comply

3.11 BIDDING ITEMS WITH RECYCLED CONTENT: In addressing environmental concerns, the City of Fort Lauderdale encourages Bidders to submit bids or alternate bids containing items with recycled content. When submitting bids containing items with recycled content, Bidder shall provide documentation adequate for the City to verify the recycled content. The City prefers packaging consisting of materials that are degradable or able to be recycled. When specifically stated in the ITB, the City may give preference to bids containing items manufactured with recycled material or packaging that is able to be recycled.

Comply

3.12 USE OF OTHER GOVERNMENTAL CONTRACTS: The City reserves the right to reject any part or all of any bids received and utilize other available governmental contracts, if such action is in its best interest.

Understood

3.13 QUALIFICATIONS/INSPECTION: Bids will only be considered from firms normally engaged in providing the types of commodities/services specified herein. The City reserves the right to inspect the Bidder's facilities, equipment, personnel, and organization at any time, or to take any other action necessary to determine Bidder's ability to perform. The Procurement Director reserves the right to reject bids where evidence or evaluation is determined to indicate inability to perform.

Comply

3.14 BID SURETY: If Special Conditions require a bid security, it shall be submitted in the amount stated. A bid security can be in the form of a bid bond or cashier's check. Bid security will be returned to the unsuccessful bidders as soon as practicable after opening of bids. Bid security will be returned to the successful bidder after acceptance of the performance bond, if required; acceptance of insurance coverage, if required; and full execution of contract documents, if required; or conditions as stated in Special Conditions.

Understood

3.15 PUBLIC RECORDS/TRADE SECRETS/COPYRIGHT: The Proposer's response to the RFP is a public record pursuant to Florida law, which is subject to disclosure by the City under the State of Florida Public Records Law, Florida Statutes Chapter 119.07 ("Public Records Law"). The City shall permit public access to all documents, papers, letters or other material submitted in connection with this RFP and the Contract to be executed for this RFP, subject to the provisions of Chapter 119.07 of the Florida Statutes.

Understood

Any language contained in the Proposer's response to the RFP purporting to require confidentiality of any portion of the Proposer's response to the RFP, except to the extent that certain information is in the City's opinion a Trade Secret pursuant to Florida law, shall be void. If a Proposer submits any documents or other information to the City which the Proposer claims is Trade Secret information and exempt from Florida Statutes Chapter 119.07 ("Public Records Laws"), the Proposer shall clearly designate that it is a Trade Secret and that it is asserting that the document or information is exempt. The Proposer must specifically identify the exemption being claimed under Florida Statutes 119.07. The City shall be the final arbiter of whether any information contained in the Proposer's response to the RFP constitutes a Trade Secret. The city's determination of whether an exemption applies shall be final, and the proposer agrees to defend, indemnify, and hold harmless the City and the City's officers, employees, and agents, against any loss or damages incurred by any person or entity as a result of the City's treatment of records as public records. In addition, the proposer agrees to defend, indemnify, and hold harmless the City and the City's officers, employees, and agents, against any loss or damages incurred by any person or entity as a result of the City's treatment of records as exempt from disclosure or confidential. Proposals bearing copyright symbols or otherwise purporting to be subject to copyright protection in full or in part may be rejected. The proposer authorizes the City to publish, copy, and reproduce any and all documents submitted to the City bearing copyright symbols or otherwise purporting to be subject to copyright protection.

Comply

EXCEPT FOR CLEARLY MARKED PORTIONS THAT ARE BONA FIDE TRADE SECRETS PURSUANT TO FLORIDA LAW, DO NOT MARK YOUR RESPONSE TO THE RFP AS PROPRIETARY OR CONFIDENTIAL. DO NOT MARK YOUR RESPONSE TO THE RFP OR ANY PART THEREOF AS COPYRIGHTED.

Comply

3.16 PROHIBITION OF INTEREST: No contract will be awarded to a bidding firm who has City elected officials, officers or employees affiliated with it, unless the bidding firm has fully complied with current Florida State Statutes and City Ordinances relating to this issue. Bidders must disclose any such affiliation. Failure to disclose any such affiliation will result in disqualification of the Bidder and removal of the Bidder from the City's bidder lists and prohibition from engaging in any business with the City.

Comply

3.17 RESERVATIONS FOR AWARD AND REJECTION OF BIDS: The City reserves the right to accept or reject any or all bids, part of bids, and to waive minor irregularities or variations to specifications contained in bids, and minor irregularities in the bidding process. The City also reserves the right to award the contract on a split order basis, lump sum basis, individual item basis, or such combination as shall best serve the interest of the City. The City reserves the right to make an award to the responsive and responsible bidder whose product or service meets the terms, conditions, and specifications of the ITB and whose bid is considered to best serve the City's interest. In determining the responsiveness of the offer and the responsibility of the Bidder, the following shall be considered when applicable: the ability, capacity and skill of the Bidder to perform as required; whether the Bidder can perform promptly, or within the time specified, without delay or interference; the character, integrity, reputation, judgment, experience and efficiency of the Bidder; the quality of past performance by the Bidder; the previous and existing compliance by the Bidder with related laws and ordinances; the sufficiency of the Bidder's financial resources; the availability, quality and adaptability of the Bidder's supplies or services to the required use; the ability of the Bidder to provide future maintenance, service or parts; the number and scope of conditions attached to the bid.

Understood

If the ITB provides for a contract trial period, the City reserves the right, in the event the selected bidder does not perform satisfactorily, to award a trial period to the next ranked bidder or to award a contract to the next ranked bidder, if that bidder has successfully provided services to the City in the past. This procedure to continue until a bidder is selected or the contract is re-bid, at the sole option of the City.

Comply

3.18 LEGAL REQUIREMENTS: Applicable provisions of all federal, state, county laws, and local ordinances, rules and regulations, shall govern development, submittal and evaluation of all bids received in response hereto and shall govern any and all claims and disputes which may arise between person(s) submitting a bid response hereto and the City by and through its officers, employees and authorized representatives, or any other person, natural or otherwise; and lack of knowledge by any bidder shall not constitute a cognizable defense against the legal effect thereof.

Understood

3.19 BID PROTEST PROCEDURE: Any proposer or bidder who is not recommended for award of a contract and who alleges a failure by the city to follow the city's procurement ordinance or any applicable law may protest to the chief procurement officer, by delivering a letter of protest to the director of finance within five (5) days after a notice of intent to award is posted on the city's web site at the following url: https://www.fortlauderdale.gov/departments/finance/procurement-services/notices-of-intent-to-award

Understood

The complete protest ordinance may be found on the city's web site at the following url: https://library.municode.com/fl/fort_lauderdale/codes/code_of_ordinances?nodeid=coor_ch2ad_artvfi_div2pr_s2-182direpr

Understood

PART IV BONDS AND INSURANCE

4.01 PERFORMANCE BOND: If a performance bond is required in Special Conditions, the Contractor shall within fifteen (15) working days after notification of award, furnish to the City a Performance Bond, payable to the City of Fort Lauderdale, Florida, in the face amount specified in Special Conditions as surety for faithful performance under the terms and conditions of the contract. If the bond is on an annual coverage basis, renewal for each succeeding year shall be submitted to the City thirty (30) days prior to the termination date of the existing Performance Bond. The Performance Bond must be executed by a surety company of recognized standing, authorized to do business in the State of Florida and having a resident agent.

Comply

Acknowledgement and agreement is given by both parties that the amount herein set for the Performance Bond is not intended to be nor shall be deemed to be in the nature of liquidated damages nor is it intended to limit the liability of the Contractor to the City in the event of a material breach of this Agreement by the Contractor.

Understood

4.02 INSURANCE: The Contractor shall assume full responsibility and expense to obtain all necessary insurance as required by City or specified in Special Conditions.

Comply

The Contractor shall provide to the Procurement Services Division original certificates of coverage and receive notification of approval of those certificates by the City's Risk Manager prior to engaging in any activities under this contract. The Contractor's insurance is subject to the approval of the City's Risk Manager. The certificates must list the City as an ADDITIONAL INSURED for General Liability Insurance and shall have no less than thirty (30) days written notice of cancellation or material change. Further modification of the insurance requirements may be made at the sole discretion of the City's Risk Manager if circumstances change or adequate protection of the City is not presented. Bidder, by submitting the bid, agrees to abide by such modifications.

Comply

Motorola will list the City as an Additional Insured per this requirement. Contractor's insurer does not provide a wet signature on the COI, and the insurer does not provide a 30-day notification on the COI. The thirty days will need to be a contract requirement per Contractor's response to each insurance requirement. Also, Contractor is not able to agree to City insurance modifications prior to Contractor's review and approval to ensure that it is able to comply therewith.

PART V PURCHASE ORDER AND CONTRACT TERMS:

5.01 COMPLIANCE WITH SPECIFICATIONS, LATE DELIVERIES/PENALTIES: Items offered may be tested for compliance with bid specifications. Items delivered which do not conform to bid specifications may be rejected and returned at Contractor's expense. Any violation resulting in contract termination for cause or delivery of items not conforming to specifications, or late delivery may also result in:

Understood

- Bidder's name being removed from the City's bidder's mailing list for a specified period and Bidder will not be recommended for any award during that period.

Understood

- All City Departments being advised to refrain from doing business with the Bidder.

Understood

- All other remedies in law or equity.

Understood

5.02 ACCEPTANCE, CONDITION, AND PACKAGING: The material delivered in response to ITB award shall remain the property of the Seller until a physical inspection is made and the material accepted to the satisfaction of the City. The material must comply fully with the terms of the ITB, be of the required quality, new, and the latest model. All containers shall be suitable for storage and shipment by common carrier, and all prices shall include standard commercial packaging. The City will not accept substitutes of any kind. Any substitutes or material not meeting specifications will be returned at the Bidder's expense. Payment will be made only after City receipt and acceptance of materials or services.

Comply

5.03 SAFETY STANDARDS: All manufactured items and fabricated assemblies shall comply with applicable requirements of the Occupation Safety and Health Act of 1970 as amended.

Comply

5.04 ASBESTOS STATEMENT: All material supplied must be 100% asbestos free. Bidder, by virtue of bidding, certifies that if awarded any portion of the ITB the bidder will supply only material or equipment that is 100% asbestos free.

Comply

5.05 OTHER GOVERNMENTAL ENTITIES: If the Bidder is awarded a contract as a result of this ITB, the bidder may, if the bidder has sufficient capacity or quantities available, provide to other governmental agencies, so requesting, the products or services awarded in accordance with the terms and conditions of the ITB and resulting contract. Prices shall be F.O.B. delivered to the requesting agency.

Understood

5.06 VERBAL INSTRUCTIONS PROCEDURE: No negotiations, decisions, or actions shall be initiated or executed by the Contractor as a result of any discussions with any City employee. Only those communications which are in writing from an authorized City representative may be considered. Only written communications from Contractors, which are assigned by a person designated as authorized to bind the Contractor, will be recognized by the City as duly authorized expressions on behalf of Contractors.

Understood

5.07 INDEPENDENT CONTRACTOR: The Contractor is an independent contractor under this Agreement. Personal services provided by the Proposer shall be by employees of the Contractor and subject to supervision by the Contractor, and not as officers, employees, or agents of the City. Personnel policies, tax responsibilities, social security, health insurance, employee benefits, procurement policies unless otherwise stated in this ITB, and other similar administrative procedures applicable to services rendered under this contract shall be those of the Contractor.

Understood

5.08 INDEMNITY/HOLD HARMLESS AGREEMENT: Contractor shall protect and defend at Contractor's expense, counsel being subject to the City's approval, and indemnify and hold harmless the City and the City's officers, employees, volunteers, and agents from and against any and all losses, penalties, fines, damages, settlements, judgments, claims, costs, charges, expenses, or liabilities, including any award of attorney fees and any award of costs, in connection with or arising directly or indirectly out of any act or omission by the Contractor or by any officer, employee, agent, invitee, subcontractor, or sublicensee of the Contractor. Without limiting the foregoing, any and all such claims, suits, or other actions relating to personal injury, death, damage to property, defects in materials or workmanship, actual or alleged violations of any applicable statute, ordinance, administrative order, rule or regulation, or decree of any court shall be included in the indemnity hereunder.

Comply

5.09 TERMINATION FOR CAUSE: If, through any cause, the Contractor shall fail to fulfill in a timely and proper manner its obligations under this Agreement, or if the Contractor shall violate any of the provisions of this Agreement, the City may upon written notice to the Contractor terminate the right of the Contractor to proceed under this Agreement, or with such part or parts of the Agreement as to which there has been default, and may hold the Contractor liable for any damages caused to the City by reason of such default and termination. In the event of such termination, any completed services performed by the Contractor under this Agreement shall, at the option of the City, become the City’s property and the Contractor shall be entitled to receive equitable compensation for any work completed to the satisfaction of the City. The Contractor, however, shall not be relieved of liability to the City for damages sustained by the City by reason of any breach of the Agreement by the Contractor, and the City may withhold any payments to the Contractor for the purpose of setoff until such time as the amount of damages due to the City from the Contractor can be determined.

Comply

5.10 TERMINATION FOR CONVENIENCE: The City reserves the right, in the City's best interest as determined by the City, to cancel any contract by giving written notice to the Contractor thirty (30) days prior to the effective date of such cancellation.

Comply with Clarification

City shall pay for all conforming hardware/software delivered and services rendered to the date of termination.

5.11 CANCELLATION FOR UNAPPROPRIATED FUNDS: The obligation of the City for payment to a Contractor is limited to the availability of funds appropriated in a current fiscal period, and continuation of the contract into a subsequent fiscal period is subject to appropriation of funds, unless otherwise authorized by law.

Comply with Clarification

City shall pay for all conforming hardware/software delivered and services rendered to the date of termination.

5.12 RECORDS/AUDIT: The Contractor shall maintain during the term of the contract all books of account, reports and records in accordance with generally accepted accounting practices and standards for records directly related to this contract. The Contractor agrees to make available to the City Auditor or the City Auditor's designee, during normal business hours and in Broward, Miami-Dade or Palm Beach Counties, all books of account, reports, and records relating to this contract. The Contractor shall retain all books of account, reports, and records relating to this contract for the duration of the contract and for three years after the final payment under this Agreement, until all pending audits, investigations or litigation matters relating to the contract are closed, or until expiration of the records retention period prescribed by Florida law or the records retention schedules adopted by the Division of Library and Information Services of the Florida Department of State, whichever is later.

Comply

5.13 PERMITS, TAXES, LICENSES: The successful Contractor shall, at his/her/its own expense, obtain all necessary permits, pay all licenses, fees and taxes, required to comply with all local ordinances, state and federal laws, rules and regulations applicable to business to be carried out under this contract.

Comply

5.14 LAWS/ORDINANCES: The Contractor shall observe and comply with all Federal, state, local and municipal laws, ordinances rules and regulations that would apply to this contract.

Comply

NON-DISCRIMINATION: The Contractor shall not, in any of its activities, including employment, discriminate against any individual on the basis of race, color, national origin, age, religion, creed, sex, disability, sexual orientation, gender, gender identity, gender expression, marital status, or any other protected classification as defined by applicable law.

Comply

1. The Contractor certifies and represents that the Contractor will comply with Section 2-187, Code of Ordinances of the City of Fort Lauderdale, Florida, (2019), as may be amended or revised, ("Section 2-187"), during the entire term of this Agreement.



Comply

2. The failure of the Contractor to comply with Section 2-187 shall be deemed to be a material breach of this Agreement, entitling the City to pursue any remedy stated below or any remedy provided under applicable law.

Understood

3. The City may terminate this Agreement if the Contractor fails to comply with Section 2-187.

Understood

4. The City may retain all monies due or to become due until the Contractor complies with Section 2-187.

Understood

5. The Contractor may be subject to debarment or suspension proceedings. Such proceedings will be consistent with the procedures in section 2-183 of the Code of Ordinances of the City of Fort Lauderdale, Florida.

Understood

5.15 UNUSUAL CIRCUMSTANCES: If during a contract term where costs to the City are to remain firm or adjustments are restricted by a percentage or CPI cap, unusual circumstances that could not have been foreseen by either party of the contract occur, and those circumstances significantly affect the Contractor's cost in providing the required prior items or services, then the Contractor may request adjustments to the costs to the City to reflect the changed circumstances. The circumstances must be beyond the control of the Contractor, and the requested adjustments must be fully documented. The City may, after examination, refuse to accept the adjusted costs if they are not properly documented, increases are considered to be excessive, or decreases are considered to be insufficient. In the event the City does not wish to accept the adjusted costs and the matter cannot be resolved to the satisfaction of the City, the City will reserve the following options:

Comply. Any adjusted costs will be mutually agreed to by the City and Motorola.

1. The contract can be canceled by the City upon giving thirty (30) days written notice to the Contractor with no penalty to the City or Contractor. The Contractor shall fill all City requirements submitted to the Contractor until the termination date contained in the notice.

Understood

2. The City requires the Contractor to continue to provide the items and services at the firm fixed (non-adjusted) cost until the termination of the contract term then in effect.

Understood

3. If the City, in its interest and in its sole opinion, determines that the Contractor in a capricious manner attempted to use this section of the contract to relieve Contractor of a legitimate obligation under the contract, and no unusual circumstances had occurred, the City reserves the right to take any and all action under law or equity. Such action shall include, but not be limited to, declaring the Contractor in default and disqualifying Contractor from receiving any business from the City for a stated period of time.

Understood

If the City does agree to adjusted costs, these adjusted costs shall not be invoiced to the City until the Contractor receives notice in writing signed by a person authorized to bind the City in such matters.



Understood

5.16 ELIGIBILITY: If applicable, the Contractor must first register with the Florida Department of State in accordance with Florida Statutes, prior to entering into a contract with the City.

Comply

5.17 PATENTS AND ROYALTIES: The Contractor, without exception, shall defend, indemnify, and hold harmless the City and the City's employees, officers, employees, volunteers, and agents from and against liability of any nature and kind, including cost and expenses for or on account of any copyrighted, patented or un-patented invention, process, or article manufactured or used in the performance of the contract, including their use by the City. If the Contractor uses any design, device, or materials covered by letters, patent or copyright, it is mutually agreed and understood without exception that the bid prices shall include any and all royalties or costs arising from the use of such design, device, or materials in any way involved in the work.

Comply with Clarification

Contractor's intellectual property indemnification is not without exception/qualification per Contractor's proposed, additional terms and conditions.

5.18 ASSIGNMENT: Contractor shall not transfer or assign the performance required by this ITB without the prior written consent of the City. Any award issued pursuant to this ITB, and the monies, which may become due hereunder, are not assignable except with the prior written approval of the City Commission or the City Manager or City Manager's designee, depending on original award approval.

Understood

5.19 GOVERNING LAW; VENUE: The Contract shall be governed by and construed in accordance with the laws of the State of Florida. Venue for any lawsuit by either party against the other party or otherwise arising out of the Contract, and for any other legal proceeding, shall be in the courts in and for Broward County, Florida, or in the event of federal jurisdiction, in the Southern District of Florida.

Comply

5.20 PUBLIC RECORDS:

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT CITY CLERK'S OFFICE, ONE EAST BROWARD BOULEVARD, SUITE 444, FORT LAUDERDALE, FLORIDA 33301, 954-828-5002, PRRCONTRACT@FORTLAUDERDALE.GOV.

Understood

Contractor shall comply with public records laws, and Contractor shall:

Understood

1. Keep and maintain public records required by the City to perform the service.

Understood

2. Upon request from the City's custodian of public records, provide the City with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes (2019), as may be amended or revised, or as otherwise provided by law.

Understood

3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the Contractor does not transfer the records to the City.

Understood

4. Upon completion of the Contract, transfer, at no cost, to the City all public records in possession of the Contractor or keep and maintain public records required by the City to perform the service. If the Contractor transfers all public records to the City upon completion of the Contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of the Contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records, in a format that is compatible with the information technology systems of the City.

Comply

Event 549-Attachment Check List

Proposer Shall Compile One (1) PDF of ALL Attachments in Sequential Order Per the Items Listed on This Checklist and Attach in the Questions Section of this Event.

Item	Section	Description	Confirm
1	3.1.1	Project Manager Documentation	☑
2	3.1.2.1	Resumes of all Project Team Members	☑
3	3.1.3.3	Subcontractor Description and Qualifications Documentation	☑
4		Subcontractor Disclosure Form **Included with Attachment 3**	☑
5	3.1.4.1	Information on Project 1	☑
6		Information on Project 2 **Included with Attachment 5**	☑
7		Information on Project 3 **Included with Attachment 5**	☑
8	3.1.4.3	Propose Equipment Capable of Operations	☑
9	3.1.4.5	Information about Service and Support	☑
10	3.1.5.1	Ongoing Maintenance and Support Program Description and Timeline	☑
11	3.1.8.3	Project Timeline Summary	☑
12		Project Timeline Full Summary **Included with Attachment 11**	☑
13	3.1.9.1	FCC Type Acceptance for Proposed Equipment	☑
14	3.1.9.2.C	List of Special Requirements	☑
15	3.1.14.2.D	Sample Acceptance Test Plan	☑
16	3.3.3.8	Contingency Plan	☑
17	3.4.13.2	Functional Description of Proposed Broadband Gateway Platform or Solution	☑
18	3.4.15.5	Configuration Diagrams and Coverage Maps	☑
19	3.10.1.10	700/800 MHz P25 Repeater Station Cutsheets	☑
20	3.11.10	Dual Stiff Arms/Ruggedized Mounts	☑
21	3.12.2.1	Technical Specification Literature for proposed microwave radio, antenna and related equipment	☑
22	3.12.2.3	A sample path profile analysis indicative of the scope to be used during the actual microwave analysis process. The sample analysis shall include all of the tower sites that encompass the Vendor's proposed radio infrastructure configuration.	☑
23	3.12.2.4	A sampe test and alignment verification process, to be used during commissioning of the microwave subsystem.	☑
24	3.12.2.6	The Vendor will provide the bandwidth provided by the proposed microwave system	☑
25	3.21.5.2.B1	Self-Testing and Diagnosis Documentation	☑
26	3.21.5.2.B2	Distribution of Diagnostics Documentation	☑
27	3.21.5.2.H	Console Modularity / Repair Documentation **See Attachment 17**	☑
28	3.21.7.1.G	Power Supply/Backup Power - UPS Documentation	☑
29	3.21.8	Flat Panel Display Documentation	☑
30	3.21.9	Headset Jack Documentation	☑

Event 549-Attachment Check List

Proposer Shall Compile One (1) PDF of ALL Attachments in Sequential Order Per the Items Listed on This Checklist and Attach in the Questions Section of this Event.

Item	Section	Description	Confirm
31	3.21.10	Footswitch Documentation	☑
32	3.21.11	Master Time Source Documentation	☑
33	3.21.12	Telecommunicators Headset Documentation	☑
34	3.22.1	Fallback Control Station documentation	☑
35	3.23.1.1	Telecommunicators Training Documentation **See Attachment 58**	☑
36	3.23.5	Fallback Training Documentation **See Attachment 58**	☑
37	3.23.8	Trainer Resumes Documentation **See Attachment 59**	☑
38	3.24.2.1	Logging Recorder Documentation	☑
39	3.25.3	Dispatch Console supporting documentation	☑
40	3.26.1	Shelter Design Documentation	☑
41	3.26.1.1.F	FEMA Floodplain documentation	☑
42	3.26.1.1.F2	List of Proposed Sites with indication of those in a FEMA Floodplain **See Attachment 41**	☑
43	3.34.2.13	Sample Tower Design Documentation for this Section **Not Applicable**	☑
44	3.42.2.1.A	FCC Type Acceptance Documentation	☑
45	3.42.2.2	End-of-Support/End-of-Life Product List	☑
46	3.42.3.1	P25 CAP Certification Documentation	☑
47	3.42.3.1.A	P25 Compliance Management Documentation **See Attachment 46**	☑
48	3.42.3.2	Special Services Documentation **See Attachment 17**	☑
49	3.42.4.1	Programming Documentation	☑
50	3.42.4.2	Key Loading Documentation	☑
51	3.42.5.1.C	MIL-STD Documentation **See Attachment 44**	☑
52	3.42.5.2.A	Portable Radio Accessory Documentation	☑
53	3.42.5.2.D	Portable Radio Carrying Case Option Documentation **See Attachment 52**	☑
54	3.42.5.2.E	Antenna Specifications Documentatio	☑
55	3.42.5.3.C1	Power Calculations Documentation **See Attachment 44**	☑
56	3.42.6.1	Mounting Options Documentation	☑
57	3.42.8.2.A	Local and Remote-Control Option Documentation	☑
58	3.42.9.4.A	Training Description	☑
59	3.42.9.6	Training Staff Resumes	☑
60	3.44.1.8.I	Sample Test and Acceptance Plan	☑
61	3.45.1.1.A1a	Warranty and Post Warranty Matrix	☑
62	3.45.6.2	Per-Site Granualr Detail	☑

Event 549-Attachment Check List

Proposer Shall Compile One (1) PDF of ALL Attachments in Sequential Order Per the Items Listed on This Checklist and Attach in the Questions Section of this Event.

Item	Section	Description	Confirm
1	3.1.1	Project Manager Documentation	☑
2	3.1.2.1	Resumes of all Project Team Members	☑
3	3.1.3.3	Subcontractor Description and Qualifications Documentation	☑
4		Subcontractor Disclosure Form **Included with Attachment 3**	☑
5	3.1.4.1	Information on Project 1	☑
6		Information on Project 2 **Included with Attachment 5**	☑
7		Information on Project 3 **Included with Attachment 5**	☑
8	3.1.4.3	Propose Equipment Capable of Operations	☑
9	3.1.4.5	Information about Service and Support	☑
10	3.1.5.1	Ongoing Maintenance and Support Program Description and Timeline	☑
11	3.1.8.3	Project Timeline Summary	☑
12		Project Timeline Full Summary **Included with Attachment 11**	☑
13	3.1.9.1	FCC Type Acceptance for Proposed Equipment	☑
14	3.1.9.2.C	List of Special Requirements	☑
15	3.1.14.2.D	Sample Acceptance Test Plan	☑
16	3.3.3.8	Contingency Plan	☑
17	3.4.13.2	Functional Description of Proposed Broadband Gateway Platform or Solution	☑
18	3.4.15.5	Configuration Diagrams and Coverage Maps	☑
19	3.10.1.10	700/800 MHz P25 Repeater Station Cutsheets	☑
20	3.11.10	Dual Stiff Arms/Ruggedized Mounts	☑
21	3.12.2.1	Technical Specification Literature for proposed microwave radio, antenna and related equipment	☑
22	3.12.2.3	A sample path profile analysis indicative of the scope to be used during the actual microwave analysis process. The sample analysis shall include all of the tower sites that encompass the Vendor's proposed radio infrastructure configuration.	☑
23	3.12.2.4	A sampe test and alignment verification process, to be used during commissioning of the microwave subsystem.	☑
24	3.12.2.6	The Vendor will provide the bandwidth provided by the proposed microwave system	☑
25	3.21.5.2.B1	Self-Testing and Diagnosis Documentation	☑
26	3.21.5.2.B2	Distribution of Diagnostics Documentation	☑
27	3.21.5.2.H	Console Modularity / Repair Documentation **See Attachment 17**	☑
28	3.21.7.1.G	Power Supply/Backup Power - UPS Documentation	☑
29	3.21.8	Flat Panel Display Documentation	☑
30	3.21.9	Headset Jack Documentation	☑

MOTOROLA SOLUTIONS

City of Fort Lauderdale

Attachment 1 - Project Manager Resume

RFP #549

December 18, 2025

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Section 1

Organization, Resources, and Experience

Core Business

At Motorola Solutions, public safety communications is what we do.

Since 1928, Motorola Solutions has proudly served the public safety and government markets by providing reliable, mission-critical interoperable wireless communications systems, products, and services. Although many companies have entered and exited the market during our history, over 90 years later, our focus is still on Public Safety.

- Motorola Solutions has a history of public safety “firsts” including:
- Pioneered mobile communications in the 1930s with car radios and public safety networks.
- Made the equipment that carried the first words from the moon in 1969.
- Implemented the first statewide network in Michigan in 1997.
- First APCO P25 Phase 2 TDMA system acceptance—Apopka Florida, 2012.

At Motorola Solutions, we are dedicated to the mission of supporting public safety communications through the development of innovative technologies designed for one purpose: to assist public safety personnel and the communities they serve in the moments that matter. Today in a rapidly changing world, we seek to make constant improvements to our products and evolve to the growing needs of our customers by anticipating the demands and operational efficiencies for the future. Cloud-based services, software enhancements, and continued subscriber improvements are just some examples.

Business Focus and Technical Expertise in Public Safety Communications

Research and Development Commitment

Motorola Solutions prioritizes investments in research and development (R&D) to expand and improve our products through both new product introductions and continuous enhancements to our core products.

Over the years, Motorola Solutions has demonstrated sustained commitment to the research and development of technology that is purpose-built for Police, Fire/EMS, correctional, and military users. Motorola Solutions has increased spending in recent years on R&D. In 2022, we spent $779M on R&D and we hold thousands of patents focused on mission-critical technologies designed specifically for public safety communications and wireless data. Recent acquisitions of complementary technology companies have also fueled this growth and enhanced our overall portfolio of product and service offerings.

Design and Implementation Experience

Over many decades, Motorola Solutions has designed, built, deployed, and improved on our mission-critical communications systems through lessons learned from the field.

City of Fort Lauderdale has spent considerable time and effort developing a plan to implement a modern, integrated wireless voice and data communications system for its first responders. For this reason, the City of Fort Lauderdale will require the most trusted and experienced mission-critical wireless communications

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systems company to successfully design and deliver radio system and optional subscribers (portables and mobiles) for a system of this size, complexity, and importance.

Motorola Solutions is an experienced prime contractor and integrator of significant statewide, countywide, and municipal mission-critical communications projects. Leveraging our experience in deploying over 1,100 public safety standards-based systems—including the first APCO P25 Phase 2 system acceptance—we have developed the system integration expertise and methodologies to deploy mission-critical systems for the public safety and government markets. Motorola Solutions has developed the largest network of system engineers, technologists, specialists, and project managers—over one thousand professionals—focused on the design, deployment, servicing and managing of public safety systems in the USA.

Motorola Solutions' P25 Leadership

Motorola Solutions has implemented hundreds more Project 25 standards-based radio communications systems than all other companies combined nationwide and here in Illinois.

The requirements of a Project 25, standards-based system have been endorsed by government agencies across North America. These standards are the functions that the public safety industry has defined as essential to mission-critical operations. Our proposed mobile and portable radio equipment is compliant with all P25 standards, which will protect the City of Fort Lauderdale's investment through the life of the system.

Since the inception of the APCO P25 initiative, Motorola Solutions has been actively engaged in the development of interoperability standards for digital radio systems. We implemented the very first P25 system in the United States for the State of Michigan. To date, we have over 1,100 P25 systems successfully staged, shipped, and accepted, with over six (6) million P25 capable subscriber devices in use worldwide. We continue to support and participate in APCO's (TIA) development of P25 Phase 2 standards.

What's more, from our Radio System Infrastructure down to our individual subscriber units, Motorola Solutions views the P25 protocols not as an upper limit of performance (a ceiling), but as a common platform (a baseline). In many cases, our system, when coupled with our subscriber units, will exceed the requirements of P25 functionality.

Peace of Mind with Motorola Solutions

Beyond the requirements, Motorola Solutions offers many benefits – both tangible and intangible – that make us the lowest-risk, best-value equipment provider for City of Fort Lauderdale. From the first mobile radio, to creating the advanced APX series of portable and mobile radios, we take pride in devising world-class solutions for our customers.

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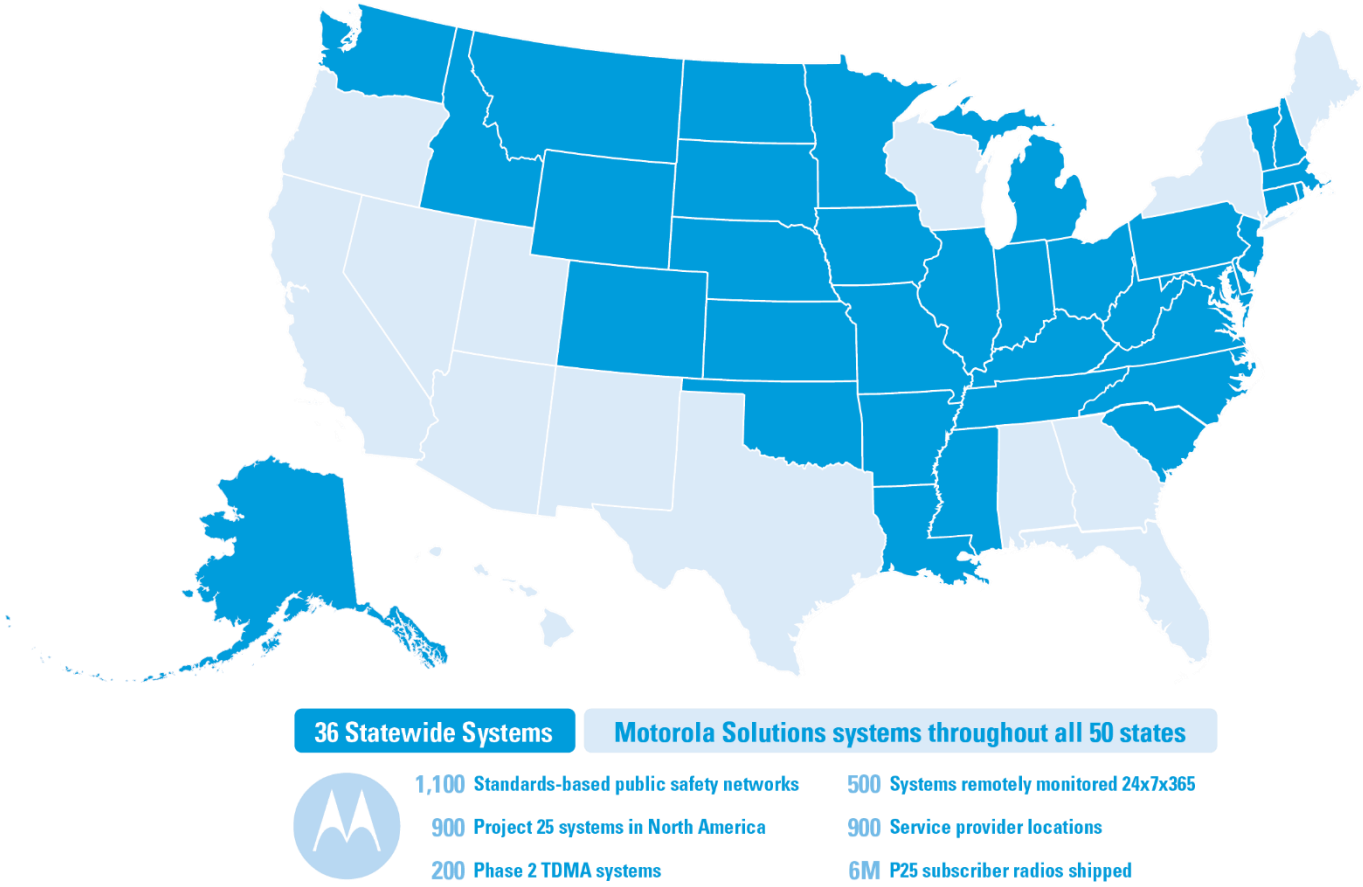


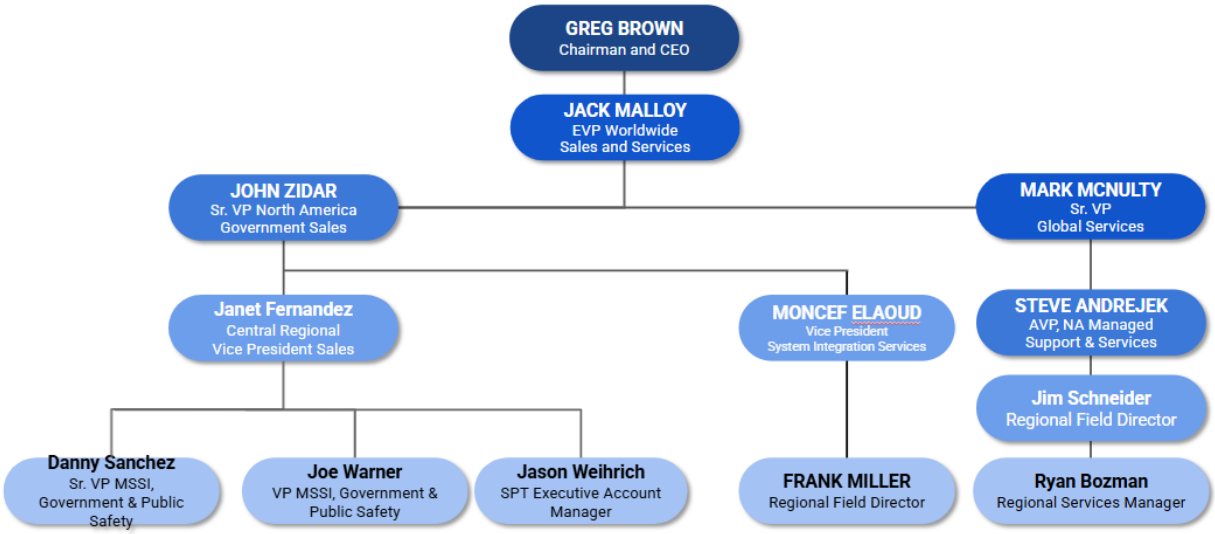
Figure: Motorola Solutions Statewide Communications

By selecting Motorola Solutions as your partner, the City of Fort Lauderdale will benefit from our unparalleled experience in similar projects, immediately improving your emergency response capabilities. The City of Fort Lauderdale will also enjoy direct interoperability with all existing P25 systems, as well as the many neighboring agencies and jurisdictions who use Motorola systems.

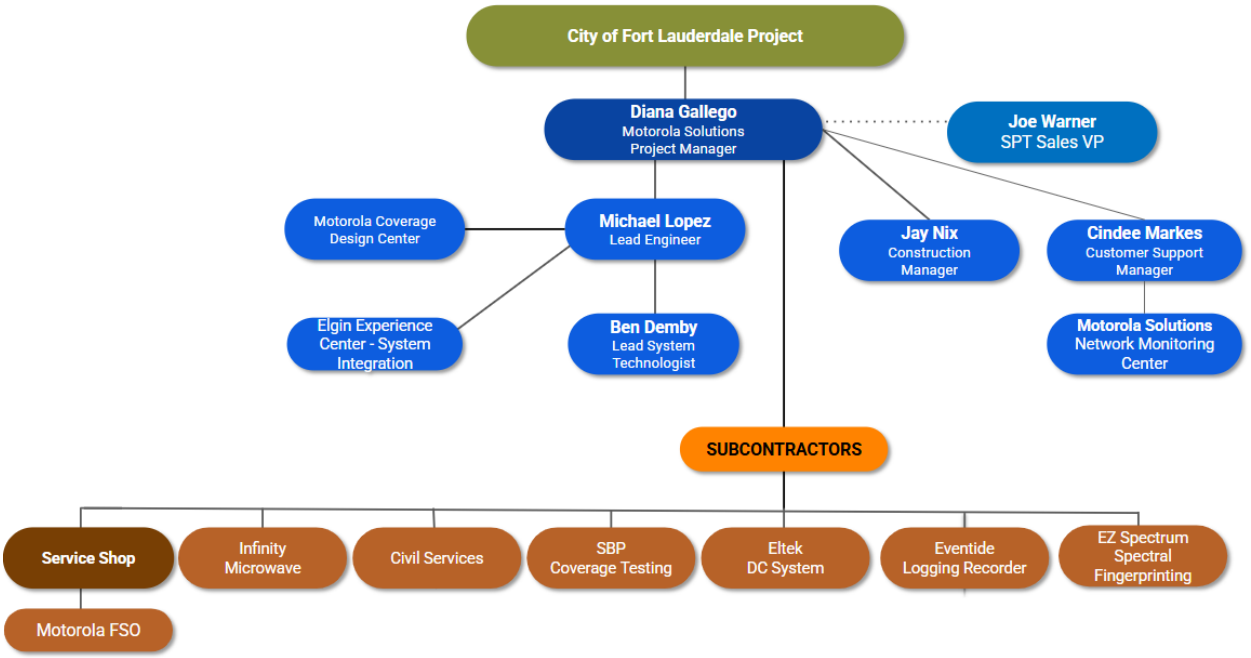
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Key Management, Operations, Service, and Technical Staff

Motorola Solutions' project staffing approach brings together a team of specialized and proven subcontractors, engineers, and project management personnel under the direction of a Lead Project Manager, **Diana Gallego , who will be 100% dedicated to City of Fort Lauderdale's project for the entire duration of the 18 month implementation schedule**. This process and approach is proven and is a foundation that Motorola Solutions has used to implement thousands of P25 system implementations. Specifically, the Motorola Solutions project team has implemented many P25 systems that include microwave backhaul, dispatch centers, civil work, and subscribers that have been on budget and on time. By integrating our subcontractor's management and staff with the Motorola Solutions team, we are able to utilize the best-qualified personnel for every task, regardless of company affiliation. The team selections are based upon individual skills, prior experience, and qualifications.



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Motorola Solutions' key team members for your project consist of the Project Manager, Project Engineer, System Technologist and Customer Support Manager. Our project team's areas of expertise, relevant experience, roles, responsibilities, and resumes are provided below.

Motorola Solutions Project Team

Project Manager - Diana Gallego

The Project Manager's primary responsibility is the successful implementation of City of Fort Lauderdale's system. Diana was selected for the City of Fort Lauderdale's project due to significant experience in P25 deployments and site construction. Successful implementation occurs when the project is completed on schedule in accordance with City of Fort Lauderdale's requirements and meets both the City of Fort Lauderdale's and Motorola Solutions' financial objectives. The Project Manager will have direct communication with City of Fort Lauderdale's Project Manager, Motorola Solutions Product Groups, Systems Technologists, Engineering, Financial, and Legal departments, and will be empowered to make binding commitments and decisions on Motorola Solutions' behalf.

Key responsibilities assigned to the Project Manager are as follows:

- Act as Motorola Solutions' single point of contact for all issues related to the contract.
- Provide the leadership and vision for the team to thrive in an environment conducive to project success.
- Maintain overall responsibility for Motorola Solutions' project resources, including additional Project Managers who will implement major subsystems.
- Provide and update the detailed Project Schedule, including major events, planned activities, and progress.
- Oversee the management of all field installation and implementation teams, ensuring all integration and optimization tasks are performed to contract requirements.

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- Ensure quality workmanship by all Motorola Solutions subcontractors.
- Oversee the product ordering process and assure manufacturing schedules meet the requirements of the Project Schedule.
- Ensure all deliverables are met according to Motorola Solutions' quality standards.
- Manage the project to ensure total customer satisfaction.
- Develop and manage a Risk Mitigation Plan designed to identify and address potential project risks and impact.
- Manage contractual requirements including change orders and schedule adherence.
- Prepare and conduct regular progress meetings and provide progress reports as required.
- Ensure a successful transition to the warranty and maintenance phase of the project.

A resume for the Project Manager is provided on the following page.

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RFP Section 3.1.1 Project Manager Resume

Diana Gallego - Senior Project Manager / Program Lead	
Date of Hire:	August 2017
Motorola Solutions Professional Experience:	Spearhead high-impact, multimillion-dollar public safety and communications infrastructure initiatives, including the deployment and upgrade of Land Mobile Radio (LMR) systems and mission-critical software solutions across New York City, Long Island, and New Jersey. Oversee full project lifecycles from planning and design through implementation and transition to operations, ensuring alignment with stakeholder expectations, regulatory requirements, and public safety objectives. ● Successfully orchestrated the closeout of a $50M+ NY Citywide Emergency Communications Program (ECTP2). ● Managed an $18M mission-critical system upgrade for NYC OTI (formerly DoITT), ensuring seamless execution and delivery. ● Directed the full lifecycle implementation of a $27M+ 14-site digital 700/800 MHz communications system for Morris County, NJ. ● Provided strategic oversight and end-to-end management of Bergen County, NJ's $15M+ multi-project communications system, encompassing a 7+ site-wide microwave and digital 700/800 MHz infrastructure. Lead cross-functional coordination, vendor engagement, and risk mitigation efforts to ensure on-time delivery, operational excellence, and full alignment with mission-critical public safety requirements across diverse customer portfolios. Accountable for strategic planning and execution throughout all phases of program and project delivery—including budgeting, forecasting, vendor oversight, and issue resolution—while consistently enhancing profit margins and customer satisfaction. Recognized for fostering cross-functional collaboration and delivering measurable financial and operational outcomes in high-pressure, high-impact environments.
Other Professional Experience:	**UBS (United Bank of Switzerland)** *Program PMO/PM – Regulatory Initiatives: Volcker (Contract via Cyber ThinK) | March 2015 – July 2017* Provided end-to-end PMO and project management support for the Group Volcker Regulatory Initiative, reporting directly to the Americas Regulatory COO and Program Director. Led executive-level reporting and governance activities, including the CEO Attestation process and quarterly regulatory submissions. Managed program financials, vendor coordination, and external professional fee tracking. Ensured compliance with Program Management Framework (PMF) standards and maintained the program's SharePoint site, supporting audits and documentation integrity across the portfolio.
Training, Certifications, & Memberships:	PMP | PMI Project Management Professional (in progress) Project Management I & II | SDLC Lifecycle | Six Sigma Fundamentals | Accounting Essentials

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MOTOROLA SOLUTIONS

City of Fort Lauderdale

Attachment 2 - Project Team Resumes

RFP # 549

December 18, 2025

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System Technologist – Ben Demby 1-4
Customer Support Manager & Support FSO Staff 1-6

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Motorola Solutions

Section 1

Project Engineer – Michael A. Lopez

The Project Engineer's primary responsibility is to assure the technical integrity of the system design. Motorola Solutions Project Engineers have significant experience in successful P25 system design with extensive qualifications and certifications. The Project Engineers will be responsible for adherence to the documented system design and implementation of that design through system optimization, programming, and acceptance testing. **Michael Lopez with be 100% dedicated to the City of Fort Lauderdale's project for the entire duration of the 18 months implementation schedule.**

Key responsibilities assigned to the Project Engineer are as follows:

- System architecture.
- Coverage design.
- Oversee the design review.
- Determine Final Bill of Materials (BOM).
- Oversee the development of all acceptance test plans.
- Prepare final test reports.
- Participate in product staging and testing at Motorola Solutions' Elgin Experience Center for Solutions Integration (EEC-Si).
- Oversee and manage other assigned staff engineers and resources supporting elements including:
    - RF and coverage design engineers.
    - Spectrum engineer/SME.
    - EEC-Si engineers, field engineering, and Acceptance Test Plan (ATP)/Coverage Acceptance Test Plan (CATP) engineering.

A resume for the Project Engineer is provided on the following pages.

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Michael A. Lopez - Project Engineer	
Date of Hire:	2019
Motorola Solutions Professional Experience:	*2019 - Present* **Principal Staff System Engineer, Motorola Solutions, Florida** Successfully complete d the following county projects: Sarasota/Manatee – 7.18, 2 Zone, Core/DSR, Priem/Geo, Simulcast sites, MCC7500. Pinellas – Completed revised detailed documents for all sites. Groveland – added a dispatch site to 7.16 core, 8 MCC7500 consoles. Desoto – Added a dispatch site to a 7.18 core, 4 MCC7500 consoles. Osceola – Added Geo-prime, redundant links, MW add, Juniper upgrade, Smart Connect, Critical Connect. Worked with UO to perform successful P25 upgrades for Polk, Tallahassee, Tampa Electric and Osceola. Marion County – Upgrade to Ethernet backhaul /MPLS from T1. Orange County – Second zone added to Apopka County Lake County – 19 MW hops, MPLS, Juniper Upgrade Marion County – PTT on location and 4 sub-site addition Wakulla County – P25 Turnkey system, 6 MW hops, DSR & Geo , Virtual Prime , Smart Features *1989 - 2019* **Principal Staff System Engineer, Motorola Solution, New York** Successfully lead the efforts on the following projects. Southampton Police -- 3 -site, 5-channel VHF simulcast system NYPD – 9-site UHF analog simulcast system. NYPD – Worked with the product team to develop the GRV8000 comparator for the NYPD. New York's dept. of information technology and telecommunications – 7-site, 15-channel mixed mode simulcast system. New York City Housing Authority – conventional simulcast system. Suffolk County Police department – 3.0, 9-site, 22-channel mixed mode simulcast. State of Michigan project – Performed the Grade of Service studies for the Statewide system. NYPD – implemented the NYPD's 94-channel CSUB design.
Other Professional Experience:	*1987 to 1989* **Mobile Data International Inc., Woodbridge, New Jersey** **Mobile Data Technician** Responsible for the maintenance and component level repair of mobile data terminals used by utility companies, Police and fire departments.

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	Brooklyn Union gas – Successfully implemented the project, which provided mobile data radio coverage for the borough of Brooklyn for their meter readers. *1983 to 1987* **Philips T & M Instruments Inc, Mahwah, New Jersey** **Senior Service Engineer** Performed the calibration and component level repair of data test equipment. *1979 to 1983* **United States Air Force, Fairbanks Alaska** **Precision Equipment Technician** Performed calibration and component level repair of various test equipment to rigid Mil-spec standards. This included Oscilloscopes, logic analyzers and multimeters.
Education:	*2002* **Polytechnic University, Westchester, New York** M.S. Information Systems Engineering. GPA: 3.9 *1998* **Caldwell College, West Caldwell, New Jersey** B.S. Computer Information System. GPA: 3.5 *1979* **United States Air Force, Denver, Colorado**
Training, Certifications, & Memberships:	**Current/In-Progress Certifications** NetSME Level 2. Preparing and studying for the CISSP Certification. **Licenses/Certs** General Radiotelephone Operators License – FCC Network + Certified. Motorola Tier 1 and Tier 2 Networking Certified Motorola NetSME Level 1 Certification **Affiliations** Board member – New Hope academy charter school for science and technology. Brooklyn, New York (January 2011 to 2016)

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System Technologist – Ben Demby

The System Technologist is responsible for ensuring that the system is tested and optimized to perform as designed. Motorola Solutions System Technologists have significant experience in successful P25 system staging and implementation with extensive qualifications and certifications. System Technologist will oversee the team responsible for all subsystems and the integration of those subsystems into the final system. In addition, the System Technologist oversees installation quality, programming, optimization, and testing of the integrated system to ensure it operates according to the specifications and system design.

Key responsibilities assigned to the System Technologist are as follows:

- Participate in the staging and testing of the system at Motorola Solutions' EEC-Si.
- Perform site link verification testing to validate connectivity and performance at City of Fort Lauderdale sites.
- Oversee the integration and optimization of all system hardware and software.
- Participate in all equipment programming and configuration development.
- Perform the optimization of RF equipment.
- Perform the optimization of the consoles.
- Participate in the Acceptance Test Plan.
- Assist in the development of the system Cutover Plan.
- Provide customer technical support.
- Oversee and manage other assigned system technologists and resources supporting optimization of the system and subsystems.

A resume for the System Technologist is provided on the following page.

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Ben C. Demby III - FSO Project Manager/Lead System Tech	
Date of Hire:	February 1990
Motorola Solutions Professional Experience:	Accomplished results-driven System Implementation Project Manager overseeing large projects, with many skill sets and local knowledge, leading the local Motorola FSO Project Team. Working with Sales, Engineering, Mot-ST Team, Customer's and Third Party Vendors on system design, installation and cutover of Public Safety Radio Systems. Current equipment P-25 radio network system, RF Sites, Dispatch Centers, system documentation, site drawings and Motorola R-56 Standards. This FSO Team is highly regarded throughout Martin Co, Palm Beach Co, Broward Co, Dade Co and Monroe Co.
Other Professional Experience:	Palm Beach: P-25 System with 11-RF Sites with 24-GTR Radios, 9-Dispatch Centers. Tri-Cities: P-25 System RF-Sites and 3-Dispatch Centers. Motorola Hosted Master Site (HMS) and interfaced the following customer to HMS: Broward County, Fort Lauderdale, Hollywood, Sunrise, Plantation, Broward Co 3-Regional Dispatch Center with 65-Ops. Martin Co: 4-RF Sites with w-ESS racks, 4-Dispatch Sites. Coral Springs 3-RF Sites and 1-Dispatch. City of FTL: 3- RF Sites with 2-ESS racks. Monroe Co: 9-RF Sites and 1- Dispatch Center. MDFR: UHF 47-Sites, 117-radios, 96- recivers, 9-Voter Sites and 4-Dispatch Centers, 7-COW Trailers (Communication On Wheels)
Education:	**George Washington University**: 10/06 Associate's Certification in Project Management **George Washington University:** 07/08 Master's Associate's Certification in Project Management **George Washington University:** 07/08 PMP Contract Management Principles and Practices
Training, Certifications, & Memberships:	**Motorola Training Courses:** 1990 to Present ANRITSU, MLC800, MCC7500, MCC7100, GTR8000 and ESS Installation and Programming, Quantar Installation and Programming, PTP Links, Site Installation Practices R-56, Smart Zone & Smart Zone Concepts, System Integration Insatiate, Centracom Programming 68000 & 6809, Astro Systems, E-911 Centralink, 1992, Conventional Centracom Series II Console, Embarc Satellite Data Systems, and MSF-5000 Digital Base Station, Centracom Series II Plus, Trunking Central Controller.

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Customer Support Manager & Support FSO Staff

Motorola Solutions' Customer Support Manager (CSM) coordinates support resources to help ensure optimal quality of service (maintenance) delivery.

Key responsibilities assigned to the Customer Support Manager are as follows:

- Oversee the execution of the City of Fort Lauderdale's system lifecycle support contract (warranty and maintenance) by serving in the role of advocate for the City of Fort Lauderdale for issue resolution.
- During the warranty and maintenance phase, act as a point of contact for issue resolution and escalation, monitoring of Motorola Solutions' contractual performance and providing review and analysis of process metrics.
- Provide all maintenance and warranty services as mentioned in this proposal.

Resumes of all FSO support staff is provided on the following pages.

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Edward Malan – Implementation Specialist	
Date of Hire:	2002
Motorola Solutions Professional Experience:	Dedicated and results-driven network and field service professional with over 22 years of experience at Motorola Solutions. Extensive background in network infrastructure, systems automation, and secure communications. Proven ability to design, implement, and maintain complex network and radio systems in demanding environments. Holds multiple certifications and a strong track record of technical leadership and hands-on expertise.
Other Professional Experience:	• System Manager of Motorola owned Astro P25 Core - South Florida. • SR Field Engineer for projects. • SR member of team that designed, built and maintained Public Safety Intranet for largest Sheriff's Department in Florida • Provided Tier II/III support and root cause analysis. • Collaborated with cross-functional teams to implement secure, resilient network designs aligned with customer requirements. • Maintained current certification status and deep expertise across Motorola, Cisco, Juniper, and other platforms.
Education:	Associate of Applied Science Electronics Engineering Technology - ITT Technical Institute, Davie FL, 1996
Training, Certifications, & Memberships:	• Cisco Certified Network Associate (CCNA) – 20+ years active • Cisco Certified Network Professional (CCNP) – 18+ years active • Cisco Certified Design Professional (CCDP) – 18+ years active • Juniper Networks Certified Associate –(JNCIA) JUNOS, Automation, Security • Juniper Networks Certified Specialist –(JNCIS) Service Provider • Certified Electronics Technician – Journeyman Electronics Technician, CNST, CST

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Fabian Lawes – Systems Technician	
Date of Hire:	August 2016
Motorola Solutions Professional Experience:	With over 11 years of hands-on experience in RF System Technology, I specialize in programming and maintaining Motorola systems, including APX subscribers and P25 radio systems across various cities. I have a proven track record of leading and executing system upgrades that significantly improve service delivery and performance. I'm passionate about nurturing team growth and training junior technicians, always aiming for innovative solutions and a commitment to continuous improvement in RF system technology.
Other Professional Experience:	Experienced with system diagnostics, repairs, and upgrades essential for maintaining operational integrity. Utilizes technical expertise to troubleshoot and resolve system issues promptly, ensuring minimal downtime. Knowledge of network configurations, hardware installations, and software management to support seamless system performance.
Education:	May 2008 Electrical Engineering University of Technology, Kingston, Jamaica Studied Electrical Engineering
Training, Certifications, & Memberships:	**Certifications:** • ETA • CET Senior Associate • CET Senior Wireless Comm • Senior Radar Electronics • ASTRO 25 DBR M12 Repeater Site Tech • Astro 25 RF SPM Technician • General Radiotelephone Operator License (FCC-GROL)) **Training:** • GTR8000 IP Simulcast Sub-System • Comptia Network Plus • Comptia Security Plus • ASTRO 25 Systems Applied Networking • Juniper-Introduction to the Junos Operating System (IJOS) • APX technical Academy • CommandCentral AXS Dispatch Console Technical Workshop • ASTRO 25 IV&D GTR 8000 Repeater Site Workshop • ASTRO 25 IV&D IP Based Digital Simulcast Workshop • MCC 7000 Series Dispatch Consoles Workshop • ASTRO 25 Network Transport Design • APX NEXT RadioCentral Workshop

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Harold Richardson – Senior System Technologist	
Date of Hire:	December 2002
Motorola Solutions Professional Experience:	In my tenure, I've had the opportunity to receive a wide range of training that allows me to maintain Subscribers, Base Stations, Digital Smart Zone, Astro IV&D Zone Core DSR System, Simulcast, Trunking, Conventional, Elite Dispatch, Fault Management, Microwave and LAN Systems.
Other Professional Experience:	During a short break in service from Motorola Inc., I began 4 years of service with CES/Team One Communications, maintaining various customer's equipment and systems in Dade, Broward and Palm Beach Counties.
Education:	Diploma: Electronic Engineering Technology RETS Technical Center
Training, Certifications, & Memberships:	• Federal Communications Commission General Radiotelephone Operator License • Smart Zone/Omni Link Certificate (Motorola WLS) • Network Essentials Certificate (Motorola WLS) • MOSCAD Fault Management (Motorola WLS) • Astro IV&D Zone Core DSR (Motorola WLS) • GTR Repeater (Motorola WLS) • MCC7500 VPM Consoles (Motorola WLS)

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Fabian Mascia – System Technologist	
Date of Hire:	May 2019
Motorola Solutions Professional Experience:	• Oversee the repair and configuration digital and analog communication systems in the field to ensure functionality across P25, broadband, and legacy RF infrastructure. • Evaluate dispatch consoles and software-driven devices for performance issues; execute advanced troubleshooting protocols to diagnose routine/complex concerns. • Conduct performance optimization across sites by analyzing RF spectrum data and applying adjustments to improve system consistency and range. • Complete extensive signal testing, including inbound and outbound radio wave assessments, to maximize reliability and functionality during high-traffic operations. • Provision new system infrastructure and integrate legacy systems with emerging technologies to support client upgrades and scalability needs. • Facilitate the end-to-end testing and validation of system installations in cooperation with project engineers and customer support teams. • Author detailed reports outlining technical issues, corrective actions, and preventative recommendations for internal and client use. • Contribute to high-priority public safety projects requiring zero-downtime transitions with the goal of uninterrupted communication for first responders.
Other Professional Experience:	Seasoned RF Systems Technician with over a decade of experience in installing, maintaining, and optimizing complex radio frequency and communication systems. Known for deep technical knowledge in RF propagation, P25 digital systems, broadband infrastructure, and DAS systems. Adept at field diagnostics, radio signal testing, system provisioning, and equipment repair down to the component level. Experienced in supporting mission-critical systems for commercial, industrial, and public safety sectors. Committed to maximizing system uptime, optimizing signal coverage, and delivering reliable solutions with precision and care.
Education, Training and Certificates:	• CompTIA Cybersecurity Analyst (CYSA+) (March 2025) • CompTIA Pentest+ (January 2025) • Senior Certified Electronics Technician (November 2024) • CompTIA Security+ (October 2024) • CompTIA Network+ (August 2024)

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John Hull – RF Design/Deploy Technician	
Date of Hire:	January 2022
Motorola Solutions Professional Experience:	Experience with Commercial and Public Safety verticals: E911, Police, Fire, Local Government, Aerospace, Hospitality, Theme Parks, Health Care, Air/ Sea Ports, and Transportation and Logistics customers. Responsible for the maintenance and repair of Motorola Communications systems including P25 and MotoTRBO topologies. Systems include RF sites, console sites, and network infrastructure. Position involves rotation in 24X7 on call support.
Other Professional Experience:	• Senior Systems Technologist - Radio One, Inc. (2007-2021) • Service Manager and Senior Systems Technologist - Coastal Electronics, Inc. (1989 - 2007)
Education:	July 1984 – June 1986 - ITT Technical Institute, Tampa, FL Associate of Applied Science: Electronic Engineering Technology, 3.9 GPA
Training, Certifications, & Memberships:	Sr. Certified Electronics Technician (CET) Comptia Network+ Certification

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Mikhail Brown – Field Service Technician	
Date of Hire:	May 2007
Motorola Solutions Professional Experience:	**Field Service Technician, 12/2016 to Current** **Motorola Solution, Inc - Plantation, FL** • Perform preventative maintenance routines to ensure proper system operation • Responsible for testing antenna systems to maximize coverage and throughput of RF signal • Performed configuration and testing of Motorola two-way radio and subscriber products • Configuration and testing switches, routers, and Network Management applications • Troubleshoot systems and work with customers to determine needed hardware and/or software changes • Interface directly with the End Users, System Support Centers, Upgrade Operations and Dispatch Operations. **System Administrator, 09/2013 to 12/2016** **Motorola Solution, Inc - Plantation, FL** • Responsible for Installing, optimizing and maintaining Integrated Voice and Data systems • Configuration and testing switches, routers, hubs, switches and Network Management applications • Planned and executed once a year system release upgrades in collaboration with the Infrastructure team • Administered daily provisioning of the system to ensure efficient and maximum usages • Perform preventative maintenance routines to ensure proper system operation • Troubleshoot systems and work with customers to determine needed hardware or software changes • Consulted with the Business and Engineering teams regarding technological needs and/or enhancements **Software Test Engineer, 05/2007 to 09/2013** **Motorola Solution, Inc - Plantation, FL** • Performed configuration and testing of Motorola two-way radio and subscriber products • Proficient with Motorola Radio Programming Software suite and Microsoft Office products • Performed optimization of Motorola Two-Way radio • Trained team members on product hardware, software and functionality • Performed black box testing using different software test tools and methodologies

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Education:	**Associates – Information Technology, October 2006** • Miami Dade College, Miami, FL **Associates - Computer Science, August 2002** • Excelsior Community College, Kingston, JA **Diploma – June 1999** • Charlemont High School, Kingston, JA
Training, Certifications, & Memberships:	• CET Master • Network + • Security + • Marine Radio Operator Permit • JNCIA-Junos • JNCIA-SEC

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Rocky L. Price – Radio Systems Manager	
Date of Hire:	October 1993
Motorola Solutions Professional Experience:	Maintain a depth of experience in instruction, maintenance, and programming in both the United States Navy and Private Industry. Possess in-depth skill sets for providing solutions to customers from concept to post-sales support. Work inter-departmentally to help companies in technology upgrades. Expertise in building “out of the box” systems, including MSF5000, Quantar, and GTR RF standalone and Simulcast sites. Oversight and management of local area networks (LANs) and wide area networks (WANs) to ensure reliability and continuity of operations. Keep networks operating at optimal levels of performance while simultaneously managing maintenance costs, saving time, and supporting services provided by vendors. Help realize significant cost savings while increasing reliability, efficiency, and security. Educate customers on the benefits of new radio systems as well as maintenance activities.
Other Professional Experience:	**United States Navy** Technical Lead in Shipboard Weapons and Communications Systems maintenance activities. Worked cross-functionally to accomplish Weapons, Engineering, and Communications Systems development success on new ships. Trained, mentored, and developed junior personnel. Took part in negotiations with the New Ship Construction Department for reviewing and editing the Acceptance Test Plan that certified shipboard Weapons System Radar and Communications. Supervision of five Shipboard Work Centers with an annual budget of $5M.
Education:	**George Washington University - Washington, D.C.** Graduate Certificate in Project Management **College of Lake County - Grayslake, IL** Associate of Science in Computer Science, 1990 **Southern Illinois University - Carbondale, IL** Bachelor of Science – Vocational Education Studies Program, 1991 **Tri-County Technical Institute - Nelsonville, OH** Studied Communications
Training, Certifications, & Memberships:	**UNITED STATES NAVY ¡ USA, Greece, and Japan** Electrical, Electronics, and Computer Technology; Shipboard Weapons and Radar Control Systems **NEW HORIZONS ¡ Plantation, FL** CISCO Certified Network Administrator Training **MOTOROLA UNIVERSITY ¡ Schaumburg, IL** Team and Time Management, Basic and Advanced Network Technology, Conventional, SMARTNET and SmartZone, P25 and Dimetra Wide-area System Training classes and programs

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Jonathan Lavalle – Sr. Field Technician, Field Installation	
Date of Hire:	April 2023
Motorola Solutions Professional Experience:	• Installation and configuration of Motorola's Astro P25 radio system operations from Monroe County to St. Lucie County. • Installation of LMR RF Systems such as transmitters, receivers and antennas. • Installation of dispatch centers for major counties and cities, including dispatch floor as well as network and radio room equipment. • Installation and implementation of MOSCAD environmental alarm management system.
Other Professional Experience:	**Outside Plant Technician Broward Co.** **AT&T Services Inc., 12/21 to 04/23** • Led teams of up to five in telco projects for both commercial and residential customers. • Place fiber-optic cables both underground and aerial according to drawings. • Span/ strand replacements, pole hardware installation as well as manholes. **Network Maintenance Technician Miami-Dade** **Comcast Corporation, 03/16 to 12/21** • Perform construction maintenance duties such as: splices aerial/underground coaxial cable and equipment to restore cable plant to system specification. • Splice and activate new coaxial plant as required in an HFC Network. • Troubleshoot the plant through the distribution cable to the node in order to restore customer video, CHSI, or CDV as required.
Education:	**Western Governors University** BS Network Operations and Security **American Academy** HS Diploma
Training, Certifications, & Memberships:	R56 Certification RF for Mission Critical Communications SCTE Member

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Yemil Buergo – Sr. Technician/Field Installer	
Date of Hire:	August 2016
Motorola Solutions Professional Experience:	A dedicated and reliable individual with experience and working knowledge of Motorola Field Network Equipment (FNE) with an emphasis on installations and removals and delivering exceptional results. Team oriented with the ability to work independently. Outstanding organization and communication skills that has led to establishing relationships with customers and project managers. • Responsible for the removal and installation of Motorola FNE to include Large Projects that are P-25 Systems (ESS Racks, GTR radios, MCC7500 and MCC7100 Ops) in a five county area. • Document customer information, details of work performed, hours worked and parts used • Collaborate with Program Management • Perform site walks • Assist with mobile vehicle installations
Other Professional Experience:	**Network Maintenance Technician Miami-Dade** **Control Communications, Inc., June 2006 - July 2016** • Removal and Installation of Motorola Field Network Equipment.
Education:	High School Diploma
Training, Certifications, & Memberships:	R56 Standard and Guidelines

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City of Fort Lauderdale

Attachment 3 - Subcontractor Disclosure and Description & Qualifications

RFP # 549

December 18, 2025

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Section 1

RFP Section 2.23 Subcontractor Disclosure Form

Sub-Contractor Disclosure Form				
List all Subcontractors that will be participating in the project, on the respondent's behalf:				
	Name of Company	Contact Person	Phone	Email
1	Delta/Eltek	Jeffrey Kempher	(815) 693-0682	jeffrey.kempher@deltaww.com
2	Infinity	Kevin Lamb	(682) 252-9572	kevinlamb@infinitytdc.com
	dbSpectra	Don Graham	(314) 223-3606	Don.graham@dbspectra.com
3	Commdex	Bailey McConnell	(770) 349-0440	BMcConnell@commdex.com
4	EMCI Wireless	Armando Rojas	(954) 888-8446	arojas@emciwireless.com
5	Eventide	Alex Spencer	(706) 294-3610	aspencer@qrsworld.com

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Section 2

RFP Section 3.1.3.3 Subcontractor Description and Qualifications



Eltek Inc.

Visiting address: 2925 E. Plano Parkway Plano, Texas 75074
www.eltek.com

Eltek is a world leader in high-efficiency power electronics and energy conversion. As a global corporation, Eltek has customers in more than 100 countries across a variety of industries including telecom, rail and infrastructure, power generation, power distribution and solar energy. Eltek is a power pioneer with over 40 years experience helping customers save energy and money while reducing their environmental impact. As a trusted partner and certified supplier.

Eltek will provide DC power systems to provide backup to all the required RF site equipment ensuring that the proposed system is resilient to any power loss scenarios.

VISION AND VALUES

Eltek's vision is to become the greatest power in the industry. Our aim is to lead the way in power technology and be a driving force in the industry. In support of these ambitions, we are fostering a unified Eltek culture where the attitudes, behaviour and performance of all Eltek employees are guided by four core values – shared across all companies in the Group:

Customer Centric: We are driven by a strong ambition to deliver products and services that contribute profoundly to our customers' own businesses

Technologically Ambitious: Our technological ambitions are a main motivator and a source of pride and self-confidence.

Aggressively Competitive: We have the culture of a challenger, always eager to outperform competitors.

Culturally Sensitive: We do not underestimate the cultural challenges of operating globally. We always act with respect for local traditions, and cooperate closely across company, cultural and geographic borders to make this happen.

Always On: Our company slogan reflects an organization that is passionate about leading the way in the industry and about delivering premium value to customers. It also reflects the essence of our offering; the power that ensures our customers' businesses keep on running and running.

Quality Assurance: Meeting the "documented" customer specification is only the surface of satisfaction.

Customer Satisfaction: Eltek strives to understand and meet the "undocumented" customer expectation. We accomplish this through seeking and analysing customer feedback through performance measurements, surveys and dialogue.

Management Involvement: The foundation for quality at Eltek is management-defined policies. These policies are the framework for business goals and objectives. Eltek management is involved in the day-to-day business operation and keeps open lines of communication internally with company personnel and externally with customers and suppliers. This provides management with the insight necessary to allocate resources and adjust to the ever-changing business environment.

Continuous Improvement: All departments at Eltek run continous Improvement projects, ranging in complexity from maintaining a form for improved understanding to re-engineering an interdepartmental system across the entire organization.

Key Performance Indicators: Each department at Eltek monitors its performance in quality, cost and service through Key Performance Indicators. Based on these, we continuously improve our processes to increase quality, decrease costs and improve service.

ISO Standards – 9001 and 14001: Eltek is committed to meeting and exceeding ISO 9001 and 14001 Quality and Environmental Management System requirements. The main manufacturing facilities are certified according to ISO 9001 and ISO 14001.

ELTEK
A Delta Group Company

- Headquarters: Drammen, Norway
- 2,500 Employees worldwide
- Regional Headquarters: Dallas, and Singapore
- Offices in 40 Countries
- Business in more than 100 countries

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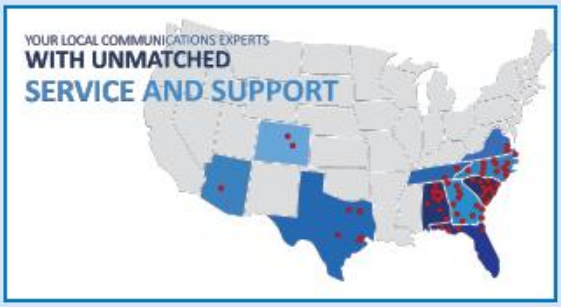


Infinity Technology Solutions, LLC

128 - C Talbert Rd, Mooresville, NC 28117

HISTORY:

Infinity Technology Solutions, LLC is a Nokia (Alcatel-Lucent) and Radio Frequency Systems (RFS) value-added distributor, specializing in microwave backhaul systems, MPLS and optical technology, and SCADA solutions. Infinity employs an exceptional, experienced and highly trained staff of system engineers, project managers and technicians, to cover the wide range of channel partner needs from complex custom solutions to turnkey system implementation.



Infinity is dedicated to supporting our channel partners, such as Motorola Solutions, throughout the entire system planning and implementation process. Our range of services includes feasibility studies, surveys, equipment selection and pricing, frequency coordination, installation, testing and tune-up of both new and existing wireless communications systems. Our knowledge of Nokia and RFS products allows us to overcome many site challenges and deliver precise and reliable solutions that are guaranteed to satisfy the needs of both channel partners and end users.

Infinity is also a full-service provider of voice and data communications solutions and network infrastructures and offers support to channel partners in design, development and installation. As a one-stop source for guidance and management of backhaul and network systems, we offer services ranging from path coverage, capacity planning and installation supervision to tower erection, microwave, and MPLS network design. For special projects and system needs, Infinity will step in with a selection of managed and consulting services, including project management, training, construction, system analysis and engineering. Please review www.infinitytdc.com

CUSTOMER REFERENCES

State of North Carolina Highway Patrol
Patrol 75+ Nokia microwave paths

Norfolk Southern Railway
90+ Nokia microwave paths and 7705 SAR-8 MPLS routers

State of Delaware
49+ Nokia microwave paths and 7705 SAR-8 routers

Infinity is a subsidiary of Mobile Communications of America, which consists of: 900+ employees working out of 75 locations in 13 states. There is a MCA Sales or Service Professional near you, ready to assist with your communication needs, providing service and maintenance support to microwave and radio communications systems throughout the region. Please review www.mccall.com

QUALIFICATIONS & SERVICES

- Engineering
- Project Management
- Technical Services
- System Design & Analysis
- Construction
- Consulting
- Training
- Support/Maintenance
- R56
- Microwave design and installation
- Full tower site development and engineering
- Warranty Service
- Installation
- Maintenance
- System Implementation
- On-Going Maintenance Services via Motorola Service Contract

infinity
TECHNOLOGY DISTRIBUTORS & CONSULTING SERVICES

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dbSpectra

1590 E. Hwy 121 Business, Bldg. A, Suite 100, Lewisville, TX 75056 (469) 322-0080

History

dbSpectra, Inc., is a Texas-based engineering and manufacturing company specializing in Radio Frequency (RF) solutions for the global wireless communications market. Since its inception in 2001, dbSpectra has focused on providing innovative, high-performance equipment for mission-critical systems.

A key early success was the development of the Control Station Combiner, a product unique for its ability to combine simplexed radios and significantly reduce the number of antennas required at a site. This commitment to innovation was further demonstrated in 2005 when dbSpectra took on the manufacturing and support of legacy Decibel Products Land Mobile Radio (LMR) site management equipment, ensuring continuity of support for critical infrastructure worldwide.

What dbSpectra does

dbSpectra designs and manufactures a comprehensive portfolio of RF passive and active components tailored for Land Mobile Radio (LMR), Public Safety, and Wireless/Cellular networks. As a trusted supplier to system integrators, dbSpectra specializes in customizing RF sub-systems and optimizing site performance.

Core offerings include:

- **Transmitter Combiners:** Multi-channel solutions for efficient site management.
- **RF Filters & Duplexers:** Precision-tuned components for frequency isolation and interference mitigation.
- **Receiver Multicouplers & Tower Top Amplifiers (TTAs):** Enhancing receive sensitivity and overall system coverage.
- **Antennas:** High-performance solutions for various mission-critical bands.

dbSpectra's true value lies in its expertise in custom RF system design and interference analysis. Their engineering team works to ensure the highest quality of delivered sensitivity and performance, often navigating the complexities of multi-carrier, congested sites to provide noise-limited system designs.

Quality & certifications:

- ISO 9001:2015 Certified
- ISO 14001:2015 Certified

Key markets served:

- Public Safety (Police, Fire, EMS)
- Government & Military
- Wireless & Cellular Infrastructure
- Oil/Gas, Transportation, and Utilities

dbSpectra
Always a Better Value

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Commdex

655 Engineering Dr, Norcross, GA 30092
(678) 689-1335

HISTORY

Commdex Consulting, LLC, is a wireless systems integrator headquartered in Norcross, Georgia, specializing in design and implementation of wireless solutions. Commdex provides infrastructure engineering and management consulting services to the telecommunications industry across the country. Since inception in 2001, Commdex has designed and implemented numerous wireless systems nationwide, utilizing the most sophisticated features and functionality.

WHAT COMMDEX DOES

Commdex provides the finest management services and solutions for telecommunications networks from concept to completion. They specialize in providing 'tailor-made' network solutions to telecommunications service providers and manufacturers for the deployment of telecom networks, facilities and supporting systems. Commdex delivers quality services utilizing the most up-to-date and leading-edge technology and methodologies.

CUSTOMER REFERENCES

Baltimore County, MD
Kevin Lenehan 410-203-0319

Johnson County, Kansas
Mike Repella (678) 977-1330

Gwinnett County, Georgia
Dan Kelly (708) 721-7000

State of South Carolina
Lee Maynard (704) 575-9313

Cobb County, Georgia Simulcast System
Lee Maynard (704) 575-9313

Marion County, Florida
Rick Harrelson (407) 271-0425

Their depth of experience in implementing single and multi-site telecom networks and switching systems enables Commdex to provide highly responsive and cost effective solutions. Through efficient management and quality consulting services, Commdex ensures that clients get maximum return on investment by managing systems to meet their current and future needs. Commdex understands the unique needs of wireless infrastructure, and develops solutions to address those individual needs.

GROWTH AND STABILITY

Commdex's track record of successes and satisfied customers speaks volumes. Because of quality service, satisfied clientele, and repeat business, Commdex has grown by more than 25% each year since inception. More than 90% of Commdex's business comes from repeat customers and customer referrals. Commdex has remained profitable and debt free, which has allowed them to service customers and employees at the highest possible level.

COMMDEX

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Electronic Maintenance and Communications, Inc. (EMCI)

3708 Sparta Road in Sebring, FL 33870
www.emciwireless.com

HISTORY

EMCI Wireless is a leading Motorola two way radio dealer and service partner. We have been in business since 1975 and have two locations in Florida. We offer end-to-end wireless solutions for our clients. Our solutions include portable and mobile two way radios, GPS vehicle tracking and wireless data/video. We provide mission-critical communications in the moments that matter.

In addition to their main service shop in Sebring, EMCI has a 5000 sq. ft. building in Sebring, and a 4500 sq. ft. building in Fort Pierce.

CUSTOMER REFERENCES

Highlands County Board of County Commissioners
Chris Benson - (863) 402-6510

St. Lucie County Public Safety
Craig Montgomery - (772) 462-8213

Hardee County Sheriff's Office
Rosie Wendell - (863) 773-4144

Desoto County Sheriff's Office
Will Wise - (863) 993-4700

Martin County Fire Rescue
Chris Kaczynski - (772) 419-6972

Sebring Police Department
Russell Morris - (863) 471-5108

St. Lucie County School Board
Don Carter - (772) 344-4474

QUALIFICATIONS

- P25 ASTRO
- Simulcast
- Trunking
- Analog
- Consoles
- R-56
- Microwave installation
- LMR subscribers installation
- Flash upgrades
- Programming
- Maintenance including infrastructure, on/off site repairs.
- Generac Generator Sales & Service Provider
- Motorola Solutions MR, Dealer, Service Partner (SES) & VAR

EMCI-Wireless

- Years in Business: 40
- 8 Technical Staff
- Warranty Service
- Installation
- Maintenance
- System Implementation
- On-Going Maintenance Services
- Generac Generator Sales & Service Provider

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Eventide, Inc.

1 Alsan Way, Little Ferry NJ 07643

Founded in 1971 and headquartered in Little Ferry, NJ, Eventide developed the first digital logging recorder in 1989. Eventide communications logging systems empower public safety agencies, utilities, universities, transportation networks, and military agencies worldwide with advanced connectivity, exceptional incident management tools, and outstanding Linux-based system reliability.

Eventide NexLog Communications Recorders and software are designed to meet the specialized needs of public safety and other critical communication users. Thousands of Eventide systems for Public Safety & Security Recording have been installed in over 50 countries for Police Agencies, Fire Departments, Ambulance Services, 9-1-1 Communication Centers, Hospitals, Transportation Networks, Airlines, Air Traffic Control Centers, Utilities, Oil & Gas Facilities, Mining Facilities, Government Agencies, and National Defense.

Eventide is located at 1 Alsan Way, Little Ferry New Jersey, 07643. All coding, testing, assembly, Tier 2 and 3 support, administration, and order fulfillment take place at this facility. Eventide is in the process of completing its work to be NIST-800-171 compliant.

Eventide is composed of two divisions:

AUDIO / BROADCAST: Eventide offers award-winning rack effects, stompboxes, plug-in and broadcast delays.

COMMUNICATIONS: Eventide offers NexLog communications recorders for public safety, utilities, P25 and air traffic control.

CUSTOMER REFERENCES

- Omaha, NE PSAP
- Lincon, NE PSAP
- St. Louis, MO PD
- Charlotte-Meklenberg, NC PSAP
- Montgomery County, PA PSAP
- Sublette County, WY PSAP
- Alleghaney County, PA PSAP

QUALIFICATIONS

- P25 ASTRO
- Simulcast
- Trunking
- Analog
- Consoles

Eventide records the items above, but does not manufacture them. Eventide also records audio and metadata from Call Works, Vesta, and other 9-1-1 and administration telephony systems, as well as MotoTRBO, Capacity Max, WAVE5000, Dimetra.

Eventide

- Eventide's partner Nelson Systems will provide the installation, training, and on-site support.
- Warranty Service
- Installation
- Maintenance
- System Implementation
- On-Going Maintenance Services

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City of Fort Lauderdale

Attachment 5 - Project Information

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.1.4.1 – Project 1

Motorola has provided the 3 references as required by the RFP.

Reference	Broward County
Address	1801 NW 64th Street Suite #106A • Fort Lauderdale • FL • 33309
Contact Person	José M. De Zayas
Contact Title	E911 Communications Administrator
Contact Department	Regional Emergency Services and Communications, Communications and Technology
System Responsibility	The Broward County P25 ORCT (Office of Regional Communications and Technology) Radio System provides mission-critical communications services primarily to public safety agencies throughout Broward County, Florida. This includes: • 31 municipalities within Broward County. • 22 Law Enforcement and Fire Rescue agencies. • Five Public Safety Answering Points (PSAPs), including those participating in the Regional Consolidated E-911 Call Taking/Dispatch System, as well as independent PSAPs like Coral Springs and Plantation that participate in the E-911 Wireline/Wireless Program. • The Broward Sheriff's Office (BSO), including their Department of Detention (DOD), Department of Law Enforcement (DLE), and Fire Rescue (FR), and all contract cities dispatched by BSO. Interoperable partners, which can include state and federal agencies.
Phone	954.770.8410
Email	JDEZAYAS@broward.org
Detailed System Summary	• 700/800MHz P25 system. • 16 site 20 channel • Phase 2 TDMA • Motorola Subscriber Radios (APX, APX NEXT, APX N70) • ISSI • SMARTCONNECT • PremierOne CAD - SMARTINCIDENT
Narrative Description	16 site P25 buildout (2017), including Microwave, consoles, and green site development throughout the county. Recent upgrades include AXS consoles (from MCC 7500) and replaced all logging recorders.

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Section 2

RFP Section 3.1.4.1 – Project 2

Reference	Alachua County
Address	911 SE 5th ST • Gainesville • FL • 32601
Contact Person	Harold Theus
Contact Title	Fire Chief
Contact Department	Fire Rescue
System Responsibility	Alachua County provides integrated radio communitions for the majority of public safety agencies in the conty including Gainsville, High Springs, La Crosse, Archer, Waldo, Micanopy, Newberry, Hawthorne and the University of Florida Police Department.
Phone	352-327-2166
Email	hmt@AlachuaCounty.us
Detailed System Summary	• 700/800MHz P25 system. • 6 site 13 channel • Phase 1 FDMA • Motorola Subscriber Radios (APX NEXT) • MCC7500 Dispatch Consoles • ISSI • RAVE
Narrative Description	Motorola provided a complete solution for Alachua County P25 System that includes a 6 site, 13-channel, trunked simulcast ASTRO 25 (P25 Phase 1) system utilizing Motorola Solutions' G-Series (GTR 8000 Base Radio) equipment at its simulcast sub-sites,

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Section 3

RFP Section 3.1.4.1 – Project 3

Reference	Clay County
Address	2519 State Road 16W • Greeen Cove Springs • FL • 32043
Contact Person	Dean Hane, PMP
Contact Title	Director
Contact Department	Management Information Systems
System Responsibility	County owned radio system, Green Coast Springs, Orange Park fire and PD all utilize the system.
Phone	904-529-2764
Email	dean.hane@claycountygov.com
Detailed System Summary	• 800MHz P25 system. • 6 site 5 channel • Phase 1 FDMA • Motorola Subscriber Radios • MCC 7500 Consoles
Narrative Description	Motorola completed a P25 system in 2016 with cutover in 2018, and have had multiple upgrade over various phases that included towers, shelters, Radios, Microwave and MPLS. The system had multiple cutovers for each phase of the overall project.

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City of Fort Lauderdale

Attachment 8 - Equipment Capable of Operations

RFP # 549

December 18, 2025

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Section 1
Equipment List 1-1

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Section 1

RFP Section 3.1.4.3 Equipment List

QTY	NOMENCLATURE	DESCRIPTION
1	SQM01SUM0323A	ASTRO MASTER SITE
1	CA03515AE	ADD: NEW PRIMARY ZONE CORE AN2024.X
1	CA03515AE-P	ADD: NEW PRIMARY ZONE CORE AN2024.X PRICE
1	CA03507AA	ADD: RACK
4	UA00153AB	ADD: ASTRO 25 FDMA SITE LICENSE
4	UA00159AB	ADD: P25 PHASE 2 TDMA TRKNG OP SITE LIC
4	UA00160AA	ADD: PHASE 2 DYNAMIC TG ASGNMT SITE LIC
3	UA00156AA	ADD: 5 CONSOLE OPS: AXS, MCC7500/E AND AIS
1	CA01499AB	ADD:DSR NOTIFICATION
6	UA00152AA	ADD:500 RADIO USER LICENSES
10	CA01316AA	ADD:UNC ADDTL DEVICE LIC (QTY 10)
3	UA00146AA	ADD: UNIFIED EVENT MANAGER (UEM)
1	UA00225AA	ADD: UEM ENHANCED NAVIGATION
1	UA00149AA	ADD: RADIO CONTROL MANAGER
1	UA00141AA	ADD: ZONEWATCH GRID & CTRL
1	UA00138AA	ADD: FLEXIBLE ATIA
1	T8742A	MCAFEE FOR WINDOWS CLIENT, A2019.2 +PLUS
1	T8806A	WINDOWS SUPP. TRANSPARENT, A2022.1
1	DSTRAK88353M	GPS CLOCK, 10MHZ, RUBIDIUM, 48V INCL ANT AND 50' COAX W--DONGLE ADAPTER
1	DLN6455R	KIT,CONFIGURATION SERVICE SOFTWARE
1	DVN4046B	MASTER SYSTEM KEY STARTER KIT
1	T8476B	KVL 5000
1	CA00182AW	ADD: AES ENCRYPTION SOFTWARE
1	CA03358AA	ADD: ASTRO 25 MODE
1	CA03467AA	ADD: NORTH AMERICA MICRO USB CHARGER 100--240V

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1	X423AG	ADD: DES--DES-XL--DES-OFB ENCRYPTION
1	CA00243AJ	ADD: ADP PRIVACY
1	HA00673AA	ADD: 5YR ESSENTIAL
1	HKN6182B	KEYLOADING CABLE CGAI ADAPTOR
1	PMKN4013C	RADIO TEST AND ALIGNMENT CABLE
1	WPLN6904A	PORTABLE KEYLOAD CABLE
1	TKN8531C	CABLE, KEYLOAD
1	TRN7343A	RACK 7.5'
1	TT4270B	Z2 MINI G9 WORKSTATION GEN14 PROCESSOR
1	T8941A	A2024.X NM CLIENT SW
1	DSF2B56AA	USB EXTERNAL DVD DRIVE
1	DSTG191B	TECH GLOBAL EVOLUTION SERIES 19INCH NON TOUCH
1	T7776A	ISSI 8000--CSSI 8000 SOFTWARE
1	UA00005AA	ADD:ISSI AUTOMATIC ROAMING LICENSE (FOR FIRST SYSTEM)
1	UA00184AA	ADD:ISSI AUTOMATIC ROAMING LICENSE (FOR SYSTEMS 2-5)
1	UA00006AA	ADD: ISSI +10 ADDITION SIMULTANEOUS TALK GROUP CAPACITY LICENSE
1	UA00042AA	ADD: ISSI 8000 CSSI 8000 REDUNDANT SOFTWARE LICENSE
1	DSB07001619	TRIPP LITE 16 PORT RACK CONSOLE KVM S 19IN RACKMOUNT SWITCH
1	DSB078101USB1	USB SINGLE SRVR INTERFACE UNIT VIRTUAL MEDIA KVM SWITCH HD15 USB RJ4
1	DSFG40F	5 X GE RJ45 PORTS (INCLUDING , 1 X WAN PORT, 4 X INTERNAL PORTS)
1	DSFC100040F8090236	FORTIGATE - 40F 3 YEAR ENTERPRISE PROTECTION
1	DSSPRACKTRAY02	RACK MOUNT TRAY FOR ALL FORTIGATE E SERIES AND F SERIES DESKTOP MODELS AND BACKWARD COMPATIBLE WITH SP-RACKTRAY-01. FOR LIST OF COMPATIBLE FORTIGATE PRODUCTS, VISIT DOCUMENTATION WEBSITE
1	DSFTK2105	FORTITOKEN-210 FIVE PIECES ONE-TIME PASSWORD TOKEN, TIME BASED PASSWORD GENERATOR. PERPETUAL LICENSE, COMPATIBLE WITH FORTIGATE, FORTIAUTHENTICATOR AND

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		FORTITOKEN CLOUD. ENCRYPTED SEED FILE IS AVAILABLE VIA CUSTOMER SUPPORT REQUEST.
1	SQM01SUM0284C	WAVE SERVER HARDWARE
2	SQM01SUM0292A	CRYPTR
2	CA02066AA	ADD: AC LINE CORD, NORTH AMERICA
2	CA02934AA	ADD: OTEK
2	CA02954AA	ADD: SECURE OPERATION
2	CA02933AA	ADD: ASTRO AES 256, DES-OFB, ADP ENCRYPTION KIT
1	SQM01SUM0323A	ASTRO MASTER SITE
1	CA03517AB	ADD: CORE EXPANSION
1	CA03713AA	ADD: CRITICAL CONNECT LMP
1	DQ-TEMP-MICROWAVE1	Microwave Wavence (9500 Microwave Packet Radio) MPT-HLC/UBT-I for complete system design
1	DQ-TEMP-MICROWAVE1	MPLS - 7705 Service Aggregation Router (SAR) for complete system design
1	DQ-TEMP-MICROWAVE1	Microwave Antennas, Line, and Hardware for complete system design
1	DQ-TEMP-MICROWAVE1	Microwave DC Power Systems for complete system design
1	DQ-TEMP-MICROWAVE1	Microwave Ancillary Equipment for complete system design
1	DQ-TEMP-TOWER	80FT MONOPOLE TOWER
2	CLN9066A	NETWORK SWITCH, JUNIPER EX4100 24-PORT NON TAA
2	CLN9105A	CABLE FRU, 1 METER JUNIPER DAC CABLE
14	DSIGSFPP10GSRC	SFP+, 10G-SR TRANSCEIVER PERP
2	DSMW3EM07641AB	FIBER OPTIC JUMPER CABLE, LC TO LC, 2 METER, MULTI MODE
1	SQM01SUM0324A	DYNAMIC SYSTEM RESILIENCE
1	CA03520AE	ADD: DSR ZONE CORE AN2024.X
1	CA03520AE-P	ADD: DSR ZONE CORE AN2024.X PRICE
1	CA03507AA	ADD: RACK
1	T8742A	MCAFEE FOR WINDOWS CLIENT, A2019.2 +PLUS
1	T8806A	WINDOWS SUPP. TRANSPARENT, A2022.1

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1	DSTRAK88353M	GPS CLOCK, 10MHZ, RUBIDIUM, 48V INCL ANT AND 50' COAX W--DONGLE ADAPTER
1	TT4270B	Z2 MINI G9 WORKSTATION GEN14 PROCESSOR
1	T8941A	A2024.X NM CLIENT SW
1	DSF2B56AA	USB EXTERNAL DVD DRIVE
1	DSTG191B	TECH GLOBAL EVOLUTION SERIES 19INCH NON TOUCH
1	DSB07001619	TRIPP LITE 16 PORT RACK CONSOLE KVM S 19IN RACKMOUNT SWITCH
1	DSB078101USB1	USB SINGLE SRVR INTERFACE UNIT VIRTUAL MEDIA KVM SWITCH HD15 USB RJ4
1	DSFG40F	5 X GE RJ45 PORTS (INCLUDING , 1 X WAN PORT, 4 X INTERNAL PORTS)
1	DSFC100040F8090236	FORTIGATE - 40F 3 YEAR ENTERPRISE PROTECTION
1	DSSPRACKTRAY02	RACK MOUNT TRAY FOR ALL FORTIGATE E SERIES AND F SERIES DESKTOP MODELS AND BACKWARD COMPATIBLE WITH SP-RACKTRAY-01. FOR LIST OF COMPATIBLE FORTIGATE PRODUCTS, VISIT DOCUMENTATION WEBSITE
1	DSFTK2105	FORTITOKEN-210 FIVE PIECES ONE-TIME PASSWORD TOKEN, TIME BASED PASSWORD GENERATOR. PERPETUAL LICENSE, COMPATIBLE WITH FORTIGATE, FORTIAUTHENTICATOR AND FORTITOKEN CLOUD. ENCRYPTED SEED FILE IS AVAILABLE VIA CUSTOMER SUPPORT REQUEST.
1	CVN6565A	SPARE CABINET ASTRO 7.9 & BEYOND
1	DLN8006A	FRU: DL380 G10 POWER SUPPLY
1	DLN8007A	FRU: DL380 G10 FAN
1	DLN6942A	1.2 TB HARD DRIVE
1	DLN6971A	FRU: HPE 9.5MM SATA DVD-RW OPTICAL DRIVE
1	DLN7018A	DL 380 G9 ETHERNET CARD
1	DLN8052A	FRE: MSA2060 DAS
1	DLN8053A	FRE: MSA2060 JBOD ENCLOSURE (HC UNC
1	DLN8054A	FRU: BARE CHASSIS, MSA2060 DAS
1	DLN8055A	FRU: POWER SUPPLY, MSA2060 DAS
1	DLN8057A	FRU: JBOD MODULE, MSA2060

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1	DLN8056A	FRU: SAS CONTROLLER, MSA2060 DAS
1	DLN8058A	FRU: 600GB HARD DRIVE FOR MSA2060 DAS
1	CKN6975A	CABLE, MINI-SAS HD TO MINI-SAS HD, LENGTH 1 METER , AWG30
1	CLN9053A	TERMINAL SERVER, SLC8000 16 PORT
1	T8493A	ROUTER, EDGE & HUB ROUTER & FIREWALL - AC
1	CA03445AA	ADD: MISSION CRITICAL HARDENING
1	CA03448AA	ADD: STATEFUL FIREWALL
1	T8492A	ROUTER, RADIO SITE ROUTER AND FIREWALL - AC
1	CA03445AA	ADD: MISSION CRITICAL HARDENING
1	CA03448AA	ADD: STATEFUL FIREWALL
1	T8910A	FIREWALL, JUNIPER SRX 345 WITH SSD, NON TAA
1	CLN9067A	NETWORK SWITCH, 48-PORT EX4100 NON TAA
1	DQ-TEMP-MICROWAVE1	Microwave and MPLS Spares
1	DSSPSPTPS600A01	SMARTPACK S CONTROLER W/A01 PROFILE: 48V UNITY STD CONFIG
1	DS241115105	FLATPACK 2 48/2000 HE RECTIFIER
1	DS275843	INVERTER, 1.5KVA, 120VAC, 48VDC INVERTER MOD
1	_INVSIERRA	Inverter Module Sierra 1000VA
1	DSCBB020E	CIRCUIT BREAKER, 20 AMP, E TRIP
1	DSCBB100E	CIRCUIT BREAKER, 100 AMP, E-TRIP
1	DSCBB025E	CIRCUIT BREAKER, 25 AMP, E TRIP
1	DSTRAK88353M	GPS CLOCK, 10MHZ, RUBIDIUM, 48V INCL ANT AND 50' COAX W/DONGLE ADAPTER
1	SQM01SUM0341A	WAVE SERVER HARDWARE 2022
1	DS11011188	PDU, 120/240 SPLIT PH OR N+1 REDUNDANT, 60A MAX PER PHASE, SIX DEDICAT
6	DS3750295	BREAKER, 5 AMP, CB UL 489 LISTED FOR AC EDGE II (1101-1188)
3	DS3750296	BREAKER, 10 AMP, CB UL 489 LISTED FOR AC EDGE II (1101-1188)
3	DS3750297	BREAKER, 15 AMP, CB UL 489 LISTED FOR AC EDGE II (1101-1188)
2	DS1101990	SPD, SHIELDED RJ-45 JACK, SINGLE LINE GBE (1000MBPS) R56 COMPLIANT

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1	DSTSJADP	RACK MOUNT GROUND BAR, 19 IN FOR TSJ AND WPH SERIES DATA SPDS
6	HKVN4729A	AXS DISPATCH CONSOLE LICENSE
6	HKVN4730A	AXS TRUNKING SERVICES LICENSE
6	HKVN4731A	AXS ADVANCED CONVENTIONAL SERVICES LICENSE
6	HKVN4732A	AXS SECURE VOICE SERVICES LICENSE
6	HKVN4733A	LICENSE,AXS INTEGRATED IRR
6	HKVN4736A	AXS AMBE+2 VOCODER ROYALTY AND LICENSE
6	HKVN4739A	AXS SECURE OTEK SERVICES LICENSE
6	HKVN4737A	AXS STANDARD LEVEL RADIO RESOURCE CAPACITY LICENSE
3	B1957A	AXS SOFTWARE DVD
6	B1951B	DISPATCH DESKTOP MICROPHONE, USB
6	CA03412AA	ADD: USB CABLE, TYPE C TO TYPE C, 4.5M
12	B1952B	DISPATCH DESKTOP SPEAKER, USB
12	CA03413AA	ADD: USB CABLE, TYPE A TO TYPE C, 4.5M
6	SQM01SUM0342A	CCHUB W/INTERNAL ENCRYPTION HW
6	B1956A	COMMANDCENTRAL HUB, W/CLIENT PC
6	CA03850AA	ADD: WINDOWS OS FOR MCC7500E CONSOLE
6	CA03553AA	ADD: AC LINE CORD, NORTH AMERICA
6	CA03547AA	ADD: BRACKET, MOUNTING 2RU
6	CA03548AA	ADD: TWO CABLES, POWER 24VDC
6	CA03572AA	ADD: CABLE RETENTION BRACKET
6	CA04101AA	ADD USB HSM KEY STORAGE
6	CA04101AA-P	ADD USB HSM KEY STORAGE PRICE
12	B1913A	MCC SERIES HEADSET JACK
6	L3226A	COMPUTER MOUSE, CERTIFIED OPTICAL WHEEL MOUSE FOR RSD SERVERS AND WORKSTATIONS
6	L3225A	CERTIFIED KEYBOARD FOR RSD SERVERS AND WORKSTATIONS
3	DSF2B56AA	USB EXTERNAL DVD DRIVE
6	DSTWIN6328A	PROVIDES ONE DUAL PEDAL FOOTSWITCH
6	3071114H01	CABLE ASSY, EXTENDER

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6	DSEV241B	TECH GLOBAL EVOLUTION SERIES 24INCH WITH TOUCH
6	T8742A	MCAFEE FOR WINDOWS CLIENT, A2019.2 +PLUS
6	T8806A	WINDOWS SUPP. TRANSPARENT, A2022.1
1	T8639A	JUNIPER CONTROL ROOM FIREWALL
1	T8669A	RECOVERY MEDIA, JUNIPER CONTROL ROOM FIREWALL
2	CLN9066A	NETWORK SWITCH, JUNIPER EX4100 24-PORT NON TAA
2	CLN9105A	CABLE FRU, 1 METER JUNIPER DAC CABLE
2	T8492A	ROUTER, RADIO SITE ROUTER AND FIREWALL - AC
2	CA03445AA	ADD: MISSION CRITICAL HARDENING
2	CA03448AA	ADD: STATEFUL FIREWALL
1	T8810A	STANDALONE DSC 8000 CONTROLLER
1	CA04079AA	ADD: ASTRO NEXT SYSTEM RELEASE 2024.X
1	CA03801AA	ADD: DSC 8000 CONVENTIONAL SITE CONTROLLER
1	UA00787AA	ADD: DSC 8000 CONVENTIONAL SITE CONTROLLER SW
1	CA03832AA	ADD: NM--DISPATCH SITE
1	T8811A	DSC AC POWER SUPPLY CHASSIS
1	CA03800AA	ADD: SINGLE POWER SUPPLY FOR DSC
1	CA03533AA	ADD: DSC AC POWER CABLE - US, 12 FT
1	SQM01SUM0333A	MCG 8000 CONVENTIONAL GATEWAY
1	CA03714AA	ADD: AC POWER
8	CA03717AA	ADD: ACIM INTERFACE
1	DSB07001619	TRIPP LITE 16 PORT RACK CONSOLE KVM S 19IN RACKMOUNT SWITCH
3	DSB078101USB1	USB SINGLE SRVR INTERFACE UNIT VIRTUAL MEDIA KVM SWITCH HD15 USB RJ4
1	T8742A	MCAFEE FOR WINDOWS CLIENT, A2019.2 +PLUS
1	T8806A	WINDOWS SUPP. TRANSPARENT, A2022.1
1	B1933A	MOTOROLA VOICE PROCESSOR MODULE
1	CA00147AF	ADD: MCC 7500 SECURE OPERATION
1	CA01220AA	ADD: MCC 7500 -- MCC 7100 OTEK OPERATION
1	CA00288AB	ADD: MCC 7500 AIS SOFTWARE LICENSE

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1	CA00143AC	ADD: DES-OFB ALOGRITHM
1	CA00182AB	ADD: AES ALOGRITHM
1	CA00245AA	ADD: ADP ALGORITHM
1	CA00140AA	ADD: AC LINE CORD, NORTH AMERICAN
1	BLN1297A	VPM POWER SUPPLY MOUNTING KIT
1	DSF2B56AA	USB EXTERNAL DVD DRIVE
1	TT4270B	Z2 MINI G9 WORKSTATION GEN14 PROCESSOR
1	DDN9748A	19 INCH BLACK SHELF
1	T8742A	MCAFEE FOR WINDOWS CLIENT, A2019.2 +PLUS
1	T8806A	WINDOWS SUPP. TRANSPARENT, A2022.1
1	DQ-TEMP-LOGGING	EVENTIDE NEXLOG 740 DX LOGGING RECORDER CONFIGURATION
1	F0016A	MC IOT MAIN MODEL
1	VA01945AA	ADD: MC EDGE AS AUX I--O SERVER
1	VA00985AA	ADD: NO PIGGY_ MC-EDGE
1	VA00147AA	ADD: FRONT CABLE COVERS
3	VA00989AA	ADD: MIXED DIGITAL _ 8DO EE 16DI 5-18 V --DRY
1	VA00009AA	ADD: AC POWER SUPPLY 12V--120W DC OUT
1	VA00153AA	ADD:I--O MODULE EXTRACTOR TOOL
1	VA01968AA	MC_EDGE DC POWER CABLE 7.5A
1	VA01967AA	INC: MC_EDGE CPU PACKING
1	VA00341AA	INC:MC-EDGE MAIN FILE SYSTEM
1	VA00142AA	INC:EXTREMDB LICENSE
3	VA00049AA	INC: I--O MODULE CABLE COVER
1	VA00974AA	INC: IOT MC-EDGE CPU PACKAGE
1	VA00442AA	INC:MC-EDGE SYSTEM SW FILES
1	VA01383AA	INC: FRONT CABLE COVERS FOR MC EDGE
1	FHN0057A	DIN RAIL STOPPER
1	DSIABDIN4	PANDUIT IABDIN4 4 RACK UNIT DIN RAIL FOR EIA 19" MOUNT
3	FHN1668A	TERM BLOCK & CONN WIRED M25T68L
1	TT4270B	Z2 MINI G9 WORKSTATION GEN14 PROCESSOR

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1	T8941A	A2024.X NM CLIENT SW
1	DSF2B56AA	USB EXTERNAL DVD DRIVE
2	TRN7343A	RACK 7.5'
1	_NETCLOCK	Safran NetClock SecureSync Model 2402-013
6	_STATUS_LIGHT_TOWER	WATSON STATUS LIGHT R/Y/G WITH POWER SUPPLY
6	_UPS_EC850LCD	PLACEHOLDER FOR CyberPower EX850LCD UPS
1	DS11011188	PDU, 120/240 SPLIT PH OR N+1 REDUNDANT, 60A MAX PER PHASE, SIX DEDICAT
6	DS3750295	BREAKER, 5 AMP, CB UL 489 LISTED FOR AC EDGE II (1101-1188)
3	DS3750296	BREAKER, 10 AMP, CB UL 489 LISTED FOR AC EDGE II (1101-1188)
3	DS3750297	BREAKER, 15 AMP, CB UL 489 LISTED FOR AC EDGE II (1101-1188)
2	DS1101990	SPD, SHIELDED RJ-45 JACK, SINGLE LINE GBE (1000MBPS) R56 COMPLIANT
1	DSTSJADP	RACK MOUNT GROUND BAR, 19 IN FOR TSJ AND WPH SERIES DATA SPDS
8	HKVN4729A	AXS DISPATCH CONSOLE LICENSE
8	HKVN4730A	AXS TRUNKING SERVICES LICENSE
8	HKVN4731A	AXS ADVANCED CONVENTIONAL SERVICES LICENSE
8	HKVN4732A	AXS SECURE VOICE SERVICES LICENSE
8	HKVN4733A	LICENSE,AXS INTEGRATED IRR
8	HKVN4736A	AXS AMBE+2 VOCODER ROYALTY AND LICENSE
8	HKVN4739A	AXS SECURE OTEK SERVICES LICENSE
8	HKVN4737A	AXS STANDARD LEVEL RADIO RESOURCE CAPACITY LICENSE
4	B1957A	AXS SOFTWARE DVD
8	B1951B	DISPATCH DESKTOP MICROPHONE, USB
8	CA03412AA	ADD: USB CABLE, TYPE C TO TYPE C, 4.5M
16	B1952B	DISPATCH DESKTOP SPEAKER, USB
16	CA03413AA	ADD: USB CABLE, TYPE A TO TYPE C, 4.5M
8	SQM01SUM0342A	CCHUB W/INTERNAL ENCRYPTION HW
8	B1956A	COMMANDCENTRAL HUB, W/CLIENT PC
8	CA03850AA	ADD: WINDOWS OS FOR MCC7500E CONSOLE

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8	CA03553AA	ADD: AC LINE CORD, NORTH AMERICA
8	CA03547AA	ADD: BRACKET, MOUNTING 2RU
8	CA03548AA	ADD: TWO CABLES, POWER 24VDC
8	CA03572AA	ADD: CABLE RETENTION BRACKET
8	CA04101AA	ADD USB HSM KEY STORAGE
8	CA04101AA-P	ADD USB HSM KEY STORAGE PRICE
16	B1913A	MCC SERIES HEADSET JACK
8	L3226A	COMPUTER MOUSE, CERTIFIED OPTICAL WHEEL MOUSE FOR RSD SERVERS AND WORKSTATIONS
8	L3225A	CERTIFIED KEYBOARD FOR RSD SERVERS AND WORKSTATIONS
4	DSF2B56AA	USB EXTERNAL DVD DRIVE
8	DSTWIN6328A	PROVIDES ONE DUAL PEDAL FOOTSWITCH
8	3071114H01	CABLE ASSY, EXTENDER
8	DSEV241B	TECH GLOBAL EVOLUTION SERIES 24INCH WITH TOUCH
8	T8742A	MCAFEE FOR WINDOWS CLIENT, A2019.2 +PLUS
8	T8806A	WINDOWS SUPP. TRANSPARENT, A2022.1
2	CLN9066A	NETWORK SWITCH, JUNIPER EX4100 24-PORT NON TAA
2	CLN9105A	CABLE FRU, 1 METER JUNIPER DAC CABLE
2	T8492A	ROUTER, RADIO SITE ROUTER AND FIREWALL - AC
2	CA03445AA	ADD: MISSION CRITICAL HARDENING
2	CA03448AA	ADD: STATEFUL FIREWALL
1	T8810A	STANDALONE DSC 8000 CONTROLLER
1	CA04079AA	ADD: ASTRO NEXT SYSTEM RELEASE 2024.X
1	CA03801AA	ADD: DSC 8000 CONVENTIONAL SITE CONTROLLER
1	UA00787AA	ADD: DSC 8000 CONVENTIONAL SITE CONTROLLER SW
1	CA03832AA	ADD: NM--DISPATCH SITE
1	T8811A	DSC AC POWER SUPPLY CHASSIS
1	CA03800AA	ADD: SINGLE POWER SUPPLY FOR DSC
1	CA03534AA	ADD: DSC AC POWER CABLE - US, 6 FT.
1	CA03763AA	ADD: CABINET MOUNTING HARDWARE

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1	SQM01SUM0333A	MCG 8000 CONVENTIONAL GATEWAY
1	CA03714AA	ADD: AC POWER
8	CA03717AA	ADD: ACIM INTERFACE
1	DSB07001619	TRIPP LITE 16 PORT RACK CONSOLE KVM S 19IN RACKMOUNT SWITCH
1	DSB078101USB1	USB SINGLE SRVR INTERFACE UNIT VIRTUAL MEDIA KVM SWITCH HD15 USB RJ4
1	T8742A	MCAFEE FOR WINDOWS CLIENT, A2019.2 +PLUS
1	T8806A	WINDOWS SUPP. TRANSPARENT, A2022.1
1	F0016A	MC IOT MAIN MODEL
1	VA01945AA	ADD: MC EDGE AS AUX I--O SERVER
1	VA00985AA	ADD: NO PIGGY_ MC-EDGE
1	VA00147AA	ADD: FRONT CABLE COVERS
3	VA00989AA	ADD: MIXED DIGITAL _ 8DO EE 16DI 5-18 V --DRY
1	VA00009AA	ADD: AC POWER SUPPLY 12V--120W DC OUT
1	VA00153AA	ADD:I--O MODULE EXTRACTOR TOOL
1	VA01968AA	MC_EDGE DC POWER CABLE 7.5A
1	VA01967AA	INC: MC_EDGE CPU PACKING
1	VA00341AA	INC:MC-EDGE MAIN FILE SYSTEM
1	VA00142AA	INC:EXTREMDB LICENSE
3	VA00049AA	INC: I--O MODULE CABLE COVER
1	VA00974AA	INC: IOT MC-EDGE CPU PACKAGE
1	VA00442AA	INC:MC-EDGE SYSTEM SW FILES
1	VA01383AA	INC: FRONT CABLE COVERS FOR MC EDGE
1	FHN0057A	DIN RAIL STOPPER
1	DSIABDIN4	PANDUIT IABDIN4 4 RACK UNIT DIN RAIL FOR EIA 19" MOUNT
3	FHN1668A	TERM BLOCK & CONN WIRED M25T68L
1	TT4270B	Z2 MINI G9 WORKSTATION GEN14 PROCESSOR
1	T8941A	A2024.X NM CLIENT SW
1	DSF2B56AA	USB EXTERNAL DVD DRIVE
2	TRN7343A	RACK 7.5'

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1	_NETCLOCK	Safran NetClock SecureSync Model 2402-013
8	_STATUS_LIGHT_TOWER	WATSON STATUS LIGHT R/Y/G WITH POWER SUPPLY
8	_UPS_EC850LCD	PLACEHOLDER FOR CyberPower EX850LCD UPS
1	B1951B	DISPATCH DESKTOP MICROPHONE, USB
1	CA03412AA	ADD: USB CABLE, TYPE C TO TYPE C, 4.5M
1	B1952B	DISPATCH DESKTOP SPEAKER, USB
1	CA03413AA	ADD: USB CABLE, TYPE A TO TYPE C, 4.5M
1	SQM01SUM0342A	CCHUB W/INTERNAL ENCRYPTION HW
1	B1956A	COMMANDCENTRAL HUB, W/CLIENT PC
1	CA03850AA	ADD: WINDOWS OS FOR MCC7500E CONSOLE
1	CA03553AA	ADD: AC LINE CORD, NORTH AMERICA
1	CA03548AA	ADD: TWO CABLES, POWER 24VDC
1	CA04101AA	ADD USB HSM KEY STORAGE
1	CA04101AA-P	ADD USB HSM KEY STORAGE PRICE
1	B1913A	MCC SERIES HEADSET JACK
1	L3226A	COMPUTER MOUSE, CERTIFIED OPTICAL WHEEL MOUSE FOR RSD SERVERS AND WORKSTATIONS
1	L3225A	CERTIFIED KEYBOARD FOR RSD SERVERS AND WORKSTATIONS
1	DSTWIN6328A	PROVIDES ONE DUAL PEDAL FOOTSWITCH
1	DSEV241B	TECH GLOBAL EVOLUTION SERIES 24INCH WITH TOUCH
1	T8742A	MCAFEE FOR WINDOWS CLIENT, A2019.2 +PLUS
1	T8806A	WINDOWS SUPP. TRANSPARENT, A2022.1
1	T8639A	JUNIPER CONTROL ROOM FIREWALL
1	T8669A	RECOVERY MEDIA, JUNIPER CONTROL ROOM FIREWALL
1	CLN9066A	NETWORK SWITCH, JUNIPER EX4100 24-PORT NON TAA
1	CLN9105A	CABLE FRU, 1 METER JUNIPER DAC CABLE
1	T8492A	ROUTER, RADIO SITE ROUTER AND FIREWALL - AC
1	CA03445AA	ADD: MISSION CRITICAL HARDENING
1	CA03448AA	ADD: STATEFUL FIREWALL
1	T8810A	STANDALONE DSC 8000 CONTROLLER

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Motorola Solutions

1	CA04079AA	ADD: ASTRO NEXT SYSTEM RELEASE 2024.X
1	CA03801AA	ADD: DSC 8000 CONVENTIONAL SITE CONTROLLER
1	UA00787AA	ADD: DSC 8000 CONVENTIONAL SITE CONTROLLER SW
1	CA03832AA	ADD: NM--DISPATCH SITE
1	T8811A	DSC AC POWER SUPPLY CHASSIS
1	CA03800AA	ADD: SINGLE POWER SUPPLY FOR DSC
1	CA03534AA	ADD: DSC AC POWER CABLE - US, 6 FT.
1	CA03763AA	ADD: CABINET MOUNTING HARDWARE
1	SQM01SUM0333A	MCG 8000 CONVENTIONAL GATEWAY
1	CA03714AA	ADD: AC POWER
8	CA03717AA	ADD: ACIM INTERFACE
1	B1934A	MCC 7500 VOICE PROCESSOR MODULE FRU
1	F0016A	MC IOT MAIN MODEL
1	VA01945AA	ADD: MC EDGE AS AUX I--O SERVER
1	VA00973AA	ADD: IOT MC-EDGE ENHANCED COMM PLUG-IN BOARD
1	VA00147AA	ADD: FRONT CABLE COVERS
3	VA00989AA	ADD: MIXED DIGITAL _ 8DO EE 16DI 5-18 V --DRY
1	VA00009AA	ADD: AC POWER SUPPLY 12V--120W DC OUT
1	VA01968AA	MC_EDGE DC POWER CABLE 7.5A
1	VA01967AA	INC: MC_EDGE CPU PACKING
1	VA00341AA	INC:MC-EDGE MAIN FILE SYSTEM
1	VA00142AA	INC:EXTREMDB LICENSE
3	VA00049AA	INC: I--O MODULE CABLE COVER
1	VA00974AA	INC: IOT MC-EDGE CPU PACKAGE
1	VA00442AA	INC:MC-EDGE SYSTEM SW FILES
1	VA01383AA	INC: FRONT CABLE COVERS FOR MC EDGE
1	FHN0057A	DIN RAIL STOPPER
1	DSIABDIN4	PANDUIT IABDIN4 4 RACK UNIT DIN RAIL FOR EIA 19" MOUNT
1	DSB07001619	TRIPP LITE 16 PORT RACK CONSOLE KVM S 19IN RACKMOUNT SWITCH

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Motorola Solutions

1	DSB078101USB1	USB SINGLE SRVR INTERFACE UNIT VIRTUAL MEDIA KVM SWITCH HD15 USB RJ4
1	DSDS8A03CS36UN	800 CONTROL STATION ANTENNA. 3 DBD
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DSNM50V12	CONNECTOR, N MALE INTERFACE FOR EC4-50
2	DSWKU	WK-U, UNIVERSAL WEATHERPROOFING KIT
300	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DSNF50V12	CONNECTOR, N FEMALE INTERFACE FOR EC4-50
6	DSGKNS	STANDARD GROUND KIT FOR 1/2" (15.5-16.5MM) EW180,WE191 & E185 CABLE, INCLUDES 5' LEAD WITH UNATTACHED 3/8" 2-HOLE LUG
2	DSHG12L	PRE-LACED HOISTING GRIP FOR 1/2" STANDARD CABLES, EACH
10	DSBH12	BH-12 BUTTERFLY HANGER FOR 1/2 AIRCELL COAX,PKG OF 10
1	DS1090501WA	RF SPD, 700-1000MHZ BROADBAND 15 VDC PASS NM ANT, NF EQUIP PIP, ASIG
25	DSEC450HF	COAXIAL CABLE, 1/2" HIFLEX, 50 OHM WITH BLACK PE JACKET
2	DSNM50B12X	CONNECTOR, N MALE INTERFACE FOR EC4-50-HF
1	DSCS74860805SN	HYBRID CONTROL STATION COMBINER, 746-869 MHZ 8 CH.
1	DSDS8A03CS36UN	800 CONTROL STATION ANTENNA. 3 DBD
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DSNM50V12	CONNECTOR, N MALE INTERFACE FOR EC4-50
2	DSWKU	WK-U, UNIVERSAL WEATHERPROOFING KIT
300	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DSNF50V12	CONNECTOR, N FEMALE INTERFACE FOR EC4-50
6	DSGKNS	STANDARD GROUND KIT FOR 1/2" (15.5-16.5MM) EW180,WE191 & E185 CABLE, INCLUDES 5' LEAD WITH UNATTACHED 3/8" 2-HOLE LUG
2	DSHG12L	PRE-LACED HOISTING GRIP FOR 1/2" STANDARD CABLES, EACH
10	DSBH12	BH-12 BUTTERFLY HANGER FOR 1/2 AIRCELL COAX,PKG OF 10

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1	DS1090501WA	RF SPD, 700-1000MHZ BROADBAND 15 VDC PASS NM ANT, NF EQUIP PIP, ASIG
25	DSEC450HF	COAXIAL CABLE, 1/2" HIFLEX, 50 OHM WITH BLACK PE JACKET
2	DSNM50B12X	CONNECTOR, N MALE INTERFACE FOR EC4-50-HF
1	DSDS8A03CS36UN	800 CONTROL STATION ANTENNA. 3 DBD
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DSNM50V12	CONNECTOR, N MALE INTERFACE FOR EC4-50
2	DSWKU	WK-U, UNIVERSAL WEATHERPROOFING KIT
200	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DSNF50V12	CONNECTOR, N FEMALE INTERFACE FOR EC4-50
5	DSGKNS	STANDARD GROUND KIT FOR 1/2" (15.5-16.5MM) EW180,WE191 & E185 CABLE, INCLUDES 5' LEAD WITH UNATTACHED 3/8" 2-HOLE LUG
1	DSHG12L	PRE-LACED HOISTING GRIP FOR 1/2" STANDARD CABLES, EACH
7	DSBH12	BH-12 BUTTERFLY HANGER FOR 1/2 AIRCELL COAX,PKG OF 10
1	DS1090501WA	RF SPD, 700-1000MHZ BROADBAND 15 VDC PASS NM ANT, NF EQUIP PIP, ASIG
25	DSEC450HF	COAXIAL CABLE, 1/2" HIFLEX, 50 OHM WITH BLACK PE JACKET
2	DSNM50B12X	CONNECTOR, N MALE INTERFACE FOR EC4-50-HF
1	DSCS74860805SN	HYBRID CONTROL STATION COMBINER, 746-869 MHZ 8 CH.
1	DSDS8A03CS36UN	800 CONTROL STATION ANTENNA. 3 DBD
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DSNM50V12	CONNECTOR, N MALE INTERFACE FOR EC4-50
2	DSWKU	WK-U, UNIVERSAL WEATHERPROOFING KIT
200	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DSNF50V12	CONNECTOR, N FEMALE INTERFACE FOR EC4-50
5	DSGKNS	STANDARD GROUND KIT FOR 1/2" (15.5-16.5MM) EW180,WE191 & E185 CABLE, INCLUDES 5' LEAD WITH UNATTACHED 3/8" 2-HOLE LUG

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1	DSHG12L	PRE-LACED HOISTING GRIP FOR 1/2" STANDARD CABLES, EACH
7	DSBH12	BH-12 BUTTERFLY HANGER FOR 1/2 AIRCELL COAX,PKG OF 10
1	DS1090501WA	RF SPD, 700-1000MHZ BROADBAND 15 VDC PASS NM ANT, NF EQUIP PIP, ASIG
25	DSEC450HF	COAXIAL CABLE, 1/2" HIFLEX, 50 OHM WITH BLACK PE JACKET
2	DSNM50B12X	CONNECTOR, N MALE INTERFACE FOR EC4-50-HF
180	DSEC450HF	COAXIAL CABLE, 1/2" HIFLEX, 50 OHM WITH BLACK PE JACKET
12	DSNM50B12X	CONNECTOR, N MALE INTERFACE FOR EC4-50-HF
240	DSEC450HF	COAXIAL CABLE, 1/2" HIFLEX, 50 OHM WITH BLACK PE JACKET
16	DSNM50B12X	CONNECTOR, N MALE INTERFACE FOR EC4-50-HF
1	SQM01SUM0338A	7/800 DBR M12 MULTI-CARRIER SITE
1	CA04069AA	ADD: NEW DBR SITE
1	CA03873AA	ADD: SYSTEM RELEASE AN2024.X
1	CA03875AA	ADD: DBR M12 PRIMARY RACK
10	CA03887AA	ADD: ANTENNA 1 CHANNELS
6	CA03891AA	ADD: 800 MHZ POWER AMPLIFIER
2	CA03895AA	ADD: INTEGRATED GNSS TIMING REF W/ RB
1	CA03906AA	ADD: 7.5 FOOT OPEN RACK
1	CA03879AA	ADD: 800 MHZ TX ANTENNA 1 FILTER
1	CA03899AA	ADD: RMC EXPANSION PRE-WIRE
2	UA00866AA	ADD: SIMULCAST SUB-SITE CONTROLLER SW
10	UA00868AA	ADD: SIMULCAST SUB-SITE BR SOFTWARE
4	UA00869AA	ADD: P25 TDMA SOFTWARE
4	UA00870AA	ADD: DYNAMIC CHANNEL ASSIGNMENT SOFTWARE
2	UA00871AA	ADD: DSC 8500 RUBIDIUM SW LICENSE
2	CA03902AA	ADD: SRX345 SITE ROUTER
2	CA03902AA-P	ADD: SRX345 SITE ROUTER PRICE
2	DSIX2L1M1DC48IG	SITE EQUIPMENT,PD, HPD GPS DATA LINE, 48VDC, HARD WIRE WITH ISOLATED GROUNDING
1	DLN8081A	FRU: RED/EXP XCVR 7-12 KIT
2	DSP04268	ALUMINUM 6061-T6. PIPE 1 INCH SCHED 40

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Motorola Solutions

2	DSWM4	HEAVY DUTY W STYLE WALL MOUNT WITH 4 INCH STAND-OFF
2	CB001133A05	CABLE,ASTRO: 125' REMOTE GPS CABLE
2	PMUG1018A	GNSS REMOTE RECEIVER ASSY
1	DSDS7C11PPYU6M	764-869 MHZ 11 DB GAIN 8' PANEL LOW-PIM/PIP, OFFSET, 4.3-10 CONNECTOR, 6-DEG DT
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
2	DSWKU	WK-U, UNIVERSAL WEATHERPROOFING KIT
40	DSEC650A	COAXIAL CABLE, "A" SERIES 1-1/4" 50 OHM CORRUGATED COPPER
2	DS4310F50V114N1	CONNECTOR, 4.3-10 FEMALE INTERFACE FOR EC6-50-A
3	DSGKN114C2	STANDARD GROUND KIT FOR 1-1/4", INCLUDES 2' LEAD WITH ATTACHED 3/8" 2-HOLE LUG
1	DSHG114L	PRE-LACED HOISTING GRIP FOR 1-1/4 AIRCELL COAX
2	DSBH114	BH-114 BUTTERFLY HANGER FOR 1-1/4 AIRCELL COAX,PKG OF 10
1	DSTSX4310FMP	4.3-10 M/F BULKHEAD COAX RF SURGE PROTECTOR, 698MHZ - 2.7GHZ PIM
1	DSBF4310	KIT FLANGE/BLKH ADAPTER 4.3-10
25	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
1	DSDS7C12P36UM	764-869MHZ ANTENNA, OMNIDIRECTIONAL 11.5 DBD, LOW-PIM/HI-PIP, 4.3-10 FEMALE
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
5	DSWKU	WK-U, UNIVERSAL WEATHERPROOFING KIT
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
40	DSEC550A	COAXIAL CABLE, "A" SERIES 7/8 IN 50 OHM CORRUGATED COPPER W/ BLACK PE

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Motorola Solutions

2	DS4310F50V78N1	CONNECTOR, 4.3-10 FEMALE INTERFACE FOR EC5-50-A
3	DSGKNM	STANDARD GROUND KIT FOR 5/8", 7/8" (21.3- 28.7MM) EW85, EW90, WE108, EW127, WE130, E130, EW132 AND WE150 CABLE, INCLUDES 5' LEAD WITH UNATTACHED 3/8" 2- HOLE LUG
1	DSHG78L	HOISTING GRIP, PRE-LACED, 7/8 IN CORRUGATED COAX
40	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
1	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
1	DS4310F50V12N1	CONNECTOR, 4.3-10 FEMALE INTERFACE FOR EC4-50
3	DSGKNS	STANDARD GROUND KIT FOR 1/2" (15.5-16.5MM) EW180,WE191 & E185 CABLE, INCLUDES 5' LEAD WITH UNATTACHED 3/8" 2-HOLE LUG
1	DSHG12L	PRE-LACED HOISTING GRIP FOR 1/2" STANDARD CABLES, EACH
2	DSBH12	BH-12 BUTTERFLY HANGER FOR 1/2 AIRCELL COAX,PKG OF 10
2	DSBH78	BH-78 BUTTERFLY HANGER FOR 7/8 AIRCELL COAX,PKG OF 10
2	DSTSXDC4310FM	DC PASS, BIDIRECTIONAL FEMALE/MALE 698MHZ - 2.7GHZ, PIM RATED
25	DSEC450HF	COAXIAL CABLE, 1/2" HIFLEX, 50 OHM WITH BLACK PE JACKET
2	DS4310M50B12X	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50-HF
25	DSEC450HF	COAXIAL CABLE, 1/2" HIFLEX, 50 OHM WITH BLACK PE JACKET
2	DS4310M50B12X	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50-HF
1	DS440030221	TTA 440, MOTOROLA TOWER TOP UNIT, 794-824 MHZ, 4.3-10 CONNS, AUTOQUAD
1	DS440037633	TTA 440, MOTOROLA CU (ESS), 794-824 MHZ, BYPASS, TEST PORT, 2DC, 4.3-10 TTA CONNECTORS
1	SQM01SUM0333A	MCG 8000 CONVENTIONAL GATEWAY
1	CA03715AA	ADD: DC POWER
8	CA03717AA	ADD: ACIM INTERFACE
1	F0016A	MC IOT MAIN MODEL
1	VA01946AA	ADD: MC EDGE AS NFM
1	VA00973AA	ADD: IOT MC-EDGE ENHANCED COMM PLUG-IN BOARD
1	VA00147AA	ADD: FRONT CABLE COVERS

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1	VA00150AA	ADD:12DI--8AI HW ONLY
1	VA00151AA	ADD:0 - 5V DI--AI
3	VA00989AA	ADD: MIXED DIGITAL _ 8DO EE 16DI 5-18 V --DRY
1	VA00991AA	ADD: DC--DC - [48 >>24] PS W--O HOUSING
1	VA00155AA	ADD:DC POWER CABLE 5A
1	VA00153AA	ADD:I--O MODULE EXTRACTOR TOOL
1	VA01967AA	INC: MC_EDGE CPU PACKING
1	VA00341AA	INC:MC-EDGE MAIN FILE SYSTEM
1	VA00142AA	INC:EXTREMDB LICENSE
4	VA00049AA	INC: I--O MODULE CABLE COVER
1	VA00974AA	INC: IOT MC-EDGE CPU PACKAGE
1	VA00047AA	INC: 12DI--8AI 0-5V
1	VA00442AA	INC:MC-EDGE SYSTEM SW FILES
1	VA01383AA	INC: FRONT CABLE COVERS FOR MC EDGE
1	FHN0057A	DIN RAIL STOPPER
1	DSIABDIN4	PANDUIT IABDIN4 4 RACK UNIT DIN RAIL FOR EIA 19" MOUNT
3	FHN1668A	TERM BLOCK & CONN WIRED M25T68L
1	TRN7343A	RACK 7.5'
1	DQ-TEMP-DC-POWER	CUSTOM DC POWER PLANT
1	DS570SA16FNRJ1S	Liebert Indoor - 120/240V 1-PH Type 1 surge protector
1	DS560SA16FNRJ1S	Liebert Indoor - 120/240 VAC 1-PHASE Type 2 surge protector
1	SQM01SUM0338A	7/800 DBR M12 MULTI-CARRIER SITE
1	CA04069AA	ADD: NEW DBR SITE
1	CA03873AA	ADD: SYSTEM RELEASE AN2024.X
1	CA03875AA	ADD: DBR M12 PRIMARY RACK
10	CA03887AA	ADD: ANTENNA 1 CHANNELS
6	CA03891AA	ADD: 800 MHZ POWER AMPLIFIER
2	CA03895AA	ADD: INTEGRATED GNSS TIMING REF W/ RB
1	CA03906AA	ADD: 7.5 FOOT OPEN RACK
1	CA03879AA	ADD: 800 MHZ TX ANTENNA 1 FILTER

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1	CA03899AA	ADD: RMC EXPANSION PRE-WIRE
2	UA00866AA	ADD: SIMULCAST SUB-SITE CONTROLLER SW
10	UA00868AA	ADD: SIMULCAST SUB-SITE BR SOFTWARE
4	UA00869AA	ADD: P25 TDMA SOFTWARE
4	UA00870AA	ADD: DYNAMIC CHANNEL ASSIGNMENT SOFTWARE
2	UA00871AA	ADD: DSC 8500 RUBIDIUM SW LICENSE
2	CA03902AA	ADD: SRX345 SITE ROUTER
2	CA03902AA-P	ADD: SRX345 SITE ROUTER PRICE
2	DSIX2L1M1DC48IG	SITE EQUIPMENT,PD, HPD GPS DATA LINE, 48VDC, HARD WIRE WITH ISOLATED GROUNDING
1	DLN8081A	FRU: RED/EXP XCVR 7-12 KIT
2	DSP04268	ALUMINUM 6061-T6. PIPE 1 INCH SCHED 40
2	DSWM4	HEAVY DUTY W STYLE WALL MOUNT WITH 4 INCH STAND-OFF
2	CB001133A05	CABLE,ASTRO: 125' REMOTE GPS CABLE
2	PMUG1018A	GNSS REMOTE RECEIVER ASSY
1	DSDS7C10P36U3M	764-869 MHZ, SINGLE ANTENNA, OMNIDIRECTIONAL, 10 DB GAIN, LOW-PIM/HI-PIP, 4.3-10 FEMALE, 3 DEG DT
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
2	DSWKU	WK-U, UNIVERSAL WEATHERPROOFING KIT
230	DSEC650A	COAXIAL CABLE, "A" SERIES 1-1/4" 50 OHM CORRUGATED COPPER
2	DS4310F50V114N1	CONNECTOR, 4.3-10 FEMALE INTERFACE FOR EC6-50-A
6	DSGKN114C2	STANDARD GROUND KIT FOR 1-1/4", INCLUDES 2' LEAD WITH ATTACHED 3/8" 2-HOLE LUG
2	DSHG114L	PRE-LACED HOISTING GRIP FOR 1-1/4 AIRCELL COAX
8	DSBH114	BH-114 BUTTERFLY HANGER FOR 1-1/4 AIRCELL COAX,PKG OF 10
1	DSTSX4310FMP	4.3-10 M/F BULKHEAD COAX RF SURGE PROTECTOR, 698MHZ - 2.7GHZ PIM
1	DSBF4310	KIT FLANGE/BLKH ADAPTER 4.3-10

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25	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
1	DSDS7C12P36UM	764-869MHZ ANTENNA, OMNIDIRECTIONAL 11.5 DBD, LOW-PIM/HI-PIP, 4.3-10 FEMALE
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
5	DSWKU	WK-U, UNIVERSAL WEATHERPROOFING KIT
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
230	DSEC550A	COAXIAL CABLE, "A" SERIES 7/8 IN 50 OHM CORRUGATED COPPER W/ BLACK PE
2	DS4310F50V78N1	CONNECTOR, 4.3-10 FEMALE INTERFACE FOR EC5-50-A
6	DSGKNM	STANDARD GROUND KIT FOR 5/8", 7/8" (21.3- 28.7MM) EW85, EW90, WE108, EW127, WE130, E130, EW132 AND WE150 CABLE, INCLUDES 5' LEAD WITH UNATTACHED 3/8" 2- HOLE LUG
2	DSHG78L	HOISTING GRIP, PRE-LACED, 7/8 IN CORRUGATED COAX
230	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
1	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
1	DS4310F50V12N1	CONNECTOR, 4.3-10 FEMALE INTERFACE FOR EC4-50
6	DSGKNS	STANDARD GROUND KIT FOR 1/2" (15.5-16.5MM) EW180,WE191 & E185 CABLE, INCLUDES 5' LEAD WITH UNATTACHED 3/8" 2-HOLE LUG
2	DSHG12L	PRE-LACED HOISTING GRIP FOR 1/2" STANDARD CABLES, EACH
8	DSBH12	BH-12 BUTTERFLY HANGER FOR 1/2 AIRCELL COAX,PKG OF 10
8	DSBH78	BH-78 BUTTERFLY HANGER FOR 7/8 AIRCELL COAX,PKG OF 10
2	DSTSXDC4310FM	DC PASS, BIDIRECTIONAL FEMALE/MALE 698MHZ - 2.7GHZ, PIM RATED
25	DSEC450HF	COAXIAL CABLE, 1/2" HIFLEX, 50 OHM WITH BLACK PE JACKET
2	DS4310M50B12X	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50-HF

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25	DSEC450HF	COAXIAL CABLE, 1/2" HIFLEX, 50 OHM WITH BLACK PE JACKET
2	DS4310M50B12X	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50-HF
1	DS440030221	TTA 440, MOTOROLA TOWER TOP UNIT, 794-824 MHZ, 4.3-10 CONNS, AUTOQUAD
1	DS440037633	TTA 440, MOTOROLA CU (ESS), 794-824 MHZ, BYPASS, TEST PORT, 2DC, 4.3-10 TTA CONNECTORS
1	SQM01SUM0333A	MCG 8000 CONVENTIONAL GATEWAY
1	CA03715AA	ADD: DC POWER
8	CA03717AA	ADD: ACIM INTERFACE
1	F0016A	MC IOT MAIN MODEL
1	VA01946AA	ADD: MC EDGE AS NFM
1	VA00973AA	ADD: IOT MC-EDGE ENHANCED COMM PLUG-IN BOARD
1	VA00147AA	ADD: FRONT CABLE COVERS
1	VA00150AA	ADD:12DI--8AI HW ONLY
1	VA00151AA	ADD:0 - 5V DI--AI
3	VA00989AA	ADD: MIXED DIGITAL _ 8DO EE 16DI 5-18 V --DRY
1	VA00991AA	ADD: DC--DC - [48 >>24] PS W--O HOUSING
1	VA00155AA	ADD:DC POWER CABLE 5A
1	VA00153AA	ADD:I--O MODULE EXTRACTOR TOOL
1	VA01967AA	INC: MC_EDGE CPU PACKING
1	VA00341AA	INC:MC-EDGE MAIN FILE SYSTEM
1	VA00142AA	INC:EXTREMDB LICENSE
4	VA00049AA	INC: I--O MODULE CABLE COVER
1	VA00974AA	INC: IOT MC-EDGE CPU PACKAGE
1	VA00047AA	INC: 12DI--8AI 0-5V
1	VA00442AA	INC:MC-EDGE SYSTEM SW FILES
1	VA01383AA	INC: FRONT CABLE COVERS FOR MC EDGE
1	FHN0057A	DIN RAIL STOPPER
1	DSIABDIN4	PANDUIT IABDIN4 4 RACK UNIT DIN RAIL FOR EIA 19" MOUNT
3	FHN1668A	TERM BLOCK & CONN WIRED M25T68L
1	TRN7343A	RACK 7.5'

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Motorola Solutions

1	DQ-TEMP-DC-POWER	CUSTOM DC POWER PLANT
1	SQM01SUM0338A	7/800 DBR M12 MULTI-CARRIER SITE
1	CA04069AA	ADD: NEW DBR SITE
1	CA03873AA	ADD: SYSTEM RELEASE AN2024.X
1	CA03875AA	ADD: DBR M12 PRIMARY RACK
10	CA03887AA	ADD: ANTENNA 1 CHANNELS
6	CA03891AA	ADD: 800 MHZ POWER AMPLIFIER
2	CA03895AA	ADD: INTEGRATED GNSS TIMING REF W/ RB
1	CA03906AA	ADD: 7.5 FOOT OPEN RACK
1	CA03879AA	ADD: 800 MHZ TX ANTENNA 1 FILTER
1	CA03899AA	ADD: RMC EXPANSION PRE-WIRE
2	UA00866AA	ADD: SIMULCAST SUB-SITE CONTROLLER SW
10	UA00868AA	ADD: SIMULCAST SUB-SITE BR SOFTWARE
4	UA00869AA	ADD: P25 TDMA SOFTWARE
4	UA00870AA	ADD: DYNAMIC CHANNEL ASSIGNMENT SOFTWARE
2	UA00871AA	ADD: DSC 8500 RUBIDIUM SW LICENSE
2	CA03902AA	ADD: SRX345 SITE ROUTER
2	CA03902AA-P	ADD: SRX345 SITE ROUTER PRICE
2	DSIX2L1M1DC48IG	SITE EQUIPMENT,PD, HPD GPS DATA LINE, 48VDC, HARD WIRE WITH ISOLATED GROUNDING
1	DLN8081A	FRU: RED/EXP XCVR 7-12 KIT
2	DSP04268	ALUMINUM 6061-T6. PIPE 1 INCH SCHED 40
2	DSWM4	HEAVY DUTY W STYLE WALL MOUNT WITH 4 INCH STAND-OFF
2	CB001133A05	CABLE,ASTRO: 125' REMOTE GPS CABLE
2	PMUG1018A	GNSS REMOTE RECEIVER ASSY
1	DSDS7C08PPVU6M	764-869 MHZ 8 DB GAIN 4' PANEL LOW-PIM/PIP, BI-DIR, 4.3-10 CONNECTOR, 6-DEG DT
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
2	DSWKU	WK-U, UNIVERSAL WEATHERPROOFING KIT

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Motorola Solutions

100	DSEC650A	COAXIAL CABLE, "A" SERIES 1-1/4" 50 OHM CORRUGATED COPPER
2	DS4310F50V114N1	CONNECTOR, 4.3-10 FEMALE INTERFACE FOR EC6-50-A
4	DSGKN114C2	STANDARD GROUND KIT FOR 1-1/4", INCLUDES 2' LEAD WITH ATTACHED 3/8" 2-HOLE LUG
1	DSHG114L	PRE-LACED HOISTING GRIP FOR 1-1/4 AIRCELL COAX
4	DSBH114	BH-114 BUTTERFLY HANGER FOR 1-1/4 AIRCELL COAX,PKG OF 10
1	DSTSX4310FMP	4.3-10 M/F BULKHEAD COAX RF SURGE PROTECTOR, 698MHZ - 2.7GHZ PIM
1	DSBF4310	KIT FLANGE/BLKH ADAPTER 4.3-10
25	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
1	DSDS7C12P36UM	764-869MHZ ANTENNA, OMNIDIRECTIONAL 11.5 DBD, LOW-PIM/HI-PIP, 4.3-10 FEMALE
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
5	DSWKU	WK-U, UNIVERSAL WEATHERPROOFING KIT
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
100	DSEC550A	COAXIAL CABLE, "A" SERIES 7/8 IN 50 OHM CORRUGATED COPPER W/ BLACK PE
2	DS4310F50V78N1	CONNECTOR, 4.3-10 FEMALE INTERFACE FOR EC5-50-A
4	DSGKNM	STANDARD GROUND KIT FOR 5/8", 7/8" (21.3- 28.7MM) EW85, EW90, WE108, EW127, WE130, E130, EW132 AND WE150 CABLE, INCLUDES 5' LEAD WITH UNATTACHED 3/8" 2- HOLE LUG
1	DSHG78L	HOISTING GRIP, PRE-LACED, 7/8 IN CORRUGATED COAX
100	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
1	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
1	DS4310F50V12N1	CONNECTOR, 4.3-10 FEMALE INTERFACE FOR EC4-50

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Motorola Solutions

4	DSGKNS	STANDARD GROUND KIT FOR 1/2" (15.5-16.5MM) EW180,WE191 & E185 CABLE, INCLUDES 5' LEAD WITH UNATTACHED 3/8" 2-HOLE LUG
1	DSHG12L	PRE-LACED HOISTING GRIP FOR 1/2" STANDARD CABLES, EACH
4	DSBH12	BH-12 BUTTERFLY HANGER FOR 1/2 AIRCELL COAX,PKG OF 10
4	DSBH78	BH-78 BUTTERFLY HANGER FOR 7/8 AIRCELL COAX,PKG OF 10
2	DSTSXDC4310FM	DC PASS, BIDIRECTIONAL FEMALE/MALE 698MHZ - 2.7GHZ, PIM RATED
25	DSEC450HF	COAXIAL CABLE, 1/2" HIFLEX, 50 OHM WITH BLACK PE JACKET
2	DS4310M50B12X	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50-HF
25	DSEC450HF	COAXIAL CABLE, 1/2" HIFLEX, 50 OHM WITH BLACK PE JACKET
2	DS4310M50B12X	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50-HF
1	DS440030221	TTA 440, MOTOROLA TOWER TOP UNIT, 794-824 MHZ, 4.3-10 CONNS, AUTOQUAD
1	DS440037633	TTA 440, MOTOROLA CU (ESS), 794-824 MHZ, BYPASS, TEST PORT, 2DC, 4.3-10 TTA CONNECTORS
1	SQM01SUM0333A	MCG 8000 CONVENTIONAL GATEWAY
1	CA03715AA	ADD: DC POWER
8	CA03717AA	ADD: ACIM INTERFACE
1	F0016A	MC IOT MAIN MODEL
1	VA01946AA	ADD: MC EDGE AS NFM
1	VA00973AA	ADD: IOT MC-EDGE ENHANCED COMM PLUG-IN BOARD
1	VA00147AA	ADD: FRONT CABLE COVERS
1	VA00150AA	ADD:12DI--8AI HW ONLY
1	VA00151AA	ADD:0 - 5V DI--AI
3	VA00989AA	ADD: MIXED DIGITAL _ 8DO EE 16DI 5-18 V --DRY
1	VA00991AA	ADD: DC--DC - [48 >>24] PS W--O HOUSING
1	VA00155AA	ADD:DC POWER CABLE 5A
1	VA00153AA	ADD:I--O MODULE EXTRACTOR TOOL
1	VA01967AA	INC: MC_EDGE CPU PACKING
1	VA00341AA	INC:MC-EDGE MAIN FILE SYSTEM
1	VA00142AA	INC:EXTREMDB LICENSE

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Motorola Solutions

4	VA00049AA	INC: I--O MODULE CABLE COVER
1	VA00974AA	INC: IOT MC-EDGE CPU PACKAGE
1	VA00047AA	INC: 12DI--8AI 0-5V
1	VA00442AA	INC:MC-EDGE SYSTEM SW FILES
1	VA01383AA	INC: FRONT CABLE COVERS FOR MC EDGE
1	FHN0057A	DIN RAIL STOPPER
1	DSIABDIN4	PANDUIT IABDIN4 4 RACK UNIT DIN RAIL FOR EIA 19" MOUNT
3	FHN1668A	TERM BLOCK & CONN WIRED M25T68L
1	TRN7343A	RACK 7.5'
1	DQ-TEMP-DC-POWER	CUSTOM DC POWER PLANT
1	DS570SA16FNRJ1S	Liebert Indoor - 120/240V 1-PH Type 1 surge protector
1	DS560SA16FNRJ1S	Liebert Indoor - 120/240 VAC 1-PHASE Type 2 surge protector
1	SQM01SUM0338A	7/800 DBR M12 MULTI-CARRIER SITE
1	CA04069AA	ADD: NEW DBR SITE
1	CA03873AA	ADD: SYSTEM RELEASE AN2024.X
1	CA03875AA	ADD: DBR M12 PRIMARY RACK
10	CA03887AA	ADD: ANTENNA 1 CHANNELS
6	CA03891AA	ADD: 800 MHZ POWER AMPLIFIER
2	CA03895AA	ADD: INTEGRATED GNSS TIMING REF W/ RB
1	CA03906AA	ADD: 7.5 FOOT OPEN RACK
1	CA03879AA	ADD: 800 MHZ TX ANTENNA 1 FILTER
1	CA03899AA	ADD: RMC EXPANSION PRE-WIRE
2	UA00866AA	ADD: SIMULCAST SUB-SITE CONTROLLER SW
10	UA00868AA	ADD: SIMULCAST SUB-SITE BR SOFTWARE
4	UA00869AA	ADD: P25 TDMA SOFTWARE
4	UA00870AA	ADD: DYNAMIC CHANNEL ASSIGNMENT SOFTWARE
2	UA00871AA	ADD: DSC 8500 RUBIDIUM SW LICENSE
2	CA03902AA	ADD: SRX345 SITE ROUTER
2	CA03902AA-P	ADD: SRX345 SITE ROUTER PRICE

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Motorola Solutions

2	DSIX2L1M1DC48IG	SITE EQUIPMENT,PD, HPD GPS DATA LINE, 48VDC, HARD WIRE WITH ISOLATED GROUNDING
1	DLN8081A	FRU: RED/EXP XCVR 7-12 KIT
2	DSP04268	ALUMINUM 6061-T6. PIPE 1 INCH SCHED 40
2	DSWM4	HEAVY DUTY W STYLE WALL MOUNT WITH 4 INCH STAND-OFF
2	CB001133A05	CABLE,ASTRO: 125' REMOTE GPS CABLE
2	PMUG1018A	GNSS REMOTE RECEIVER ASSY
1	SQM01SUM0338A	7/800 DBR M12 MULTI-CARRIER SITE
1	CA04069AA	ADD: NEW DBR SITE
1	CA03873AA	ADD: SYSTEM RELEASE AN2024.X
1	CA03876AA	ADD: DBR M12 EXPANSION RACK 1
5	CA03887AA	ADD: ANTENNA 1 CHANNELS
3	CA03891AA	ADD: 800 MHZ POWER AMPLIFIER
1	CA03906AA	ADD: 7.5 FOOT OPEN RACK
1	CA03879AA	ADD: 800 MHZ TX ANTENNA 1 FILTER
1	CA03899AA	ADD: RMC EXPANSION PRE-WIRE
5	UA00868AA	ADD: SIMULCAST SUB-SITE BR SOFTWARE
2	DSIX2L1M1DC48IG	SITE EQUIPMENT,PD, HPD GPS DATA LINE, 48VDC, HARD WIRE WITH ISOLATED GROUNDING
2	DSP04268	ALUMINUM 6061-T6. PIPE 1 INCH SCHED 40
2	DSWM4	HEAVY DUTY W STYLE WALL MOUNT WITH 4 INCH STAND-OFF
2	CB001133A05	CABLE,ASTRO: 125' REMOTE GPS CABLE
2	PMUG1018A	GNSS REMOTE RECEIVER ASSY
5	_TRUNKINGADJ2	REMOVE TRUNKING LICENSES FOR CONVENTIONAL CHANNELS
5	_ANALOGCONV	ADD: ANALOG CONVENTIONAL SITE REPEATER BR SOFTWARE
1	DSDS7C10P36U3M	764-869 MHZ, SINGLE ANTENNA, OMNIDIRECTIONAL, 10 DB GAIN, LOW-PIM/HI-PIP, 4.3-10 FEMALE, 3 DEG DT
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
2	DSWKU	WK-U, UNIVERSAL WEATHERPROOFING KIT

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Motorola Solutions

200	DSEC650A	COAXIAL CABLE, "A" SERIES 1-1/4" 50 OHM CORRUGATED COPPER
2	DS4310F50V114N1	CONNECTOR, 4.3-10 FEMALE INTERFACE FOR EC6-50-A
5	DSGKN114C2	STANDARD GROUND KIT FOR 1-1/4", INCLUDES 2' LEAD WITH ATTACHED 3/8" 2-HOLE LUG
1	DSHG114L	PRE-LACED HOISTING GRIP FOR 1-1/4 AIRCELL COAX
7	DSBH114	BH-114 BUTTERFLY HANGER FOR 1-1/4 AIRCELL COAX,PKG OF 10
1	DSTSX4310FMP	4.3-10 M/F BULKHEAD COAX RF SURGE PROTECTOR, 698MHZ - 2.7GHZ PIM
1	DSBF4310	KIT FLANGE/BLKH ADAPTER 4.3-10
25	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
1	DSDS7C12P36UM	764-869MHZ ANTENNA, OMNIDIRECTIONAL 11.5 DBD, LOW-PIM/HI-PIP, 4.3-10 FEMALE
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
2	DSWKU	WK-U, UNIVERSAL WEATHERPROOFING KIT
300	DSEC650A	COAXIAL CABLE, "A" SERIES 1-1/4" 50 OHM CORRUGATED COPPER
2	DS4310F50V114N1	CONNECTOR, 4.3-10 FEMALE INTERFACE FOR EC6-50-A
6	DSGKN114C2	STANDARD GROUND KIT FOR 1-1/4", INCLUDES 2' LEAD WITH ATTACHED 3/8" 2-HOLE LUG
2	DSHG114L	PRE-LACED HOISTING GRIP FOR 1-1/4 AIRCELL COAX
10	DSBH114	BH-114 BUTTERFLY HANGER FOR 1-1/4 AIRCELL COAX,PKG OF 10
1	DSTSX4310FMP	4.3-10 M/F BULKHEAD COAX RF SURGE PROTECTOR, 698MHZ - 2.7GHZ PIM
1	DSBF4310	KIT FLANGE/BLKH ADAPTER 4.3-10
25	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50

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Motorola Solutions

1	DSDS7C12P36UM	764-869MHZ ANTENNA, OMNIDIRECTIONAL 11.5 DBD, LOW-PIM/HI-PIP, 4.3-10 FEMALE
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
5	DSWKU	WK-U, UNIVERSAL WEATHERPROOFING KIT
15	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
2	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
290	DSEC550A	COAXIAL CABLE, "A" SERIES 7/8 IN 50 OHM CORRUGATED COPPER W/ BLACK PE
2	DS4310F50V78N1	CONNECTOR, 4.3-10 FEMALE INTERFACE FOR EC5-50-A
6	DSGKNM	STANDARD GROUND KIT FOR 5/8", 7/8" (21.3- 28.7MM) EW85, EW90, WE108, EW127, WE130, E130, EW132 AND WE150 CABLE, INCLUDES 5' LEAD WITH UNATTACHED 3/8" 2- HOLE LUG
2	DSHG78L	HOISTING GRIP, PRE-LACED, 7/8 IN CORRUGATED COAX
290	DSEC450	COAXIAL CABLE, 1/2" 50 OHM CORRUGATED COPPER WITH BLACK PE JACKET
1	DS4310M50V12N1	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50
1	DS4310F50V12N1	CONNECTOR, 4.3-10 FEMALE INTERFACE FOR EC4-50
6	DSGKNS	STANDARD GROUND KIT FOR 1/2" (15.5-16.5MM) EW180,WE191 & E185 CABLE, INCLUDES 5' LEAD WITH UNATTACHED 3/8" 2-HOLE LUG
2	DSHG12L	PRE-LACED HOISTING GRIP FOR 1/2" STANDARD CABLES, EACH
10	DSBH12	BH-12 BUTTERFLY HANGER FOR 1/2 AIRCELL COAX,PKG OF 10
10	DSBH78	BH-78 BUTTERFLY HANGER FOR 7/8 AIRCELL COAX,PKG OF 10
2	DSTSXDC4310FM	DC PASS, BIDIRECTIONAL FEMALE/MALE 698MHZ - 2.7GHZ, PIM RATED
25	DSEC450HF	COAXIAL CABLE, 1/2" HIFLEX, 50 OHM WITH BLACK PE JACKET
2	DS4310M50B12X	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50-HF
25	DSEC450HF	COAXIAL CABLE, 1/2" HIFLEX, 50 OHM WITH BLACK PE JACKET
2	DS4310M50B12X	CONNECTOR, 4.3-10 MALE INTERFACE FOR EC4-50-HF

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Motorola Solutions

1	DS440030221	TTA 440, MOTOROLA TOWER TOP UNIT, 794-824 MHZ, 4.3-10 CONNS, AUTOQUAD
1	DS440037633	TTA 440, MOTOROLA CU (ESS), 794-824 MHZ, BYPASS, TEST PORT, 2DC, 4.3-10 TTA CONNECTORS
1	SQM01SUM0333A	MCG 8000 CONVENTIONAL GATEWAY
1	CA03715AA	ADD: DC POWER
8	CA03717AA	ADD: ACIM INTERFACE
1	F0016A	MC IOT MAIN MODEL
1	VA01946AA	ADD: MC EDGE AS NFM
1	VA00973AA	ADD: IOT MC-EDGE ENHANCED COMM PLUG-IN BOARD
1	VA00147AA	ADD: FRONT CABLE COVERS
1	VA00150AA	ADD:12DI--8AI HW ONLY
1	VA00151AA	ADD:0 - 5V DI--AI
3	VA00989AA	ADD: MIXED DIGITAL _ 8DO EE 16DI 5-18 V --DRY
1	VA00991AA	ADD: DC--DC - [48 >>24] PS W--O HOUSING
1	VA00155AA	ADD:DC POWER CABLE 5A
1	VA00153AA	ADD:I--O MODULE EXTRACTOR TOOL
1	VA01967AA	INC: MC_EDGE CPU PACKING
1	VA00341AA	INC:MC-EDGE MAIN FILE SYSTEM
1	VA00142AA	INC:EXTREMDB LICENSE
4	VA00049AA	INC: I--O MODULE CABLE COVER
1	VA00974AA	INC: IOT MC-EDGE CPU PACKAGE
1	VA00047AA	INC: 12DI--8AI 0-5V
1	VA00442AA	INC:MC-EDGE SYSTEM SW FILES
1	VA01383AA	INC: FRONT CABLE COVERS FOR MC EDGE
1	FHN0057A	DIN RAIL STOPPER
1	DSIABDIN4	PANDUIT IABDIN4 4 RACK UNIT DIN RAIL FOR EIA 19" MOUNT
3	FHN1668A	TERM BLOCK & CONN WIRED M25T68L
1	TRN7343A	RACK 7.5'
1	DQ-TEMP-DC-POWER	CUSTOM DC POWER PLANT

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Motorola Solutions

1	DQ-TEMP-SHELTER-CONC	VFP 12' X 30' X 9' PREFAB BUILDING FOR STATE OF FLORIDA TOWER SITE
1	DQ-TEMP-SHELTER-CONC	RAISED PLATFORM FOR STATE OF FLORIDA TOWER SITE
1	F0016A	MC IOT MAIN MODEL
1	VA01946AA	ADD: MC EDGE AS NFM
1	VA00973AA	ADD: IOT MC-EDGE ENHANCED COMM PLUG-IN BOARD
1	VA00150AA	ADD:12DI--8AI HW ONLY
1	VA00151AA	ADD:0 - 5V DI--AI
3	VA00989AA	ADD: MIXED DIGITAL _ 8DO EE 16DI 5-18 V --DRY
1	VA00991AA	ADD: DC--DC - [48 >>24] PS W--O HOUSING
1	VA00155AA	ADD:DC POWER CABLE 5A
1	VA01967AA	INC: MC_EDGE CPU PACKING
1	VA00341AA	INC:MC-EDGE MAIN FILE SYSTEM
1	VA00142AA	INC:EXTREMDB LICENSE
1	VA00974AA	INC: IOT MC-EDGE CPU PACKAGE
1	VA00047AA	INC: 12DI--8AI 0-5V
1	VA00442AA	INC:MC-EDGE SYSTEM SW FILES
1	FHN0057A	DIN RAIL STOPPER
1	DSIABDIN4	PANDUIT IABDIN4 4 RACK UNIT DIN RAIL FOR EIA 19" MOUNT
1	T8547A	SITE ROUTER & FIREWALL, DC POWER
1	CA03445AA	ADD: MISSION CRITICAL HARDENING
1	CA03448AA	ADD: STATEFUL FIREWALL
1	DSNMA01450	N MALE, PLENUM & ULTRA FLEXIBLE FOR 1/4'' CABLE (USE WITH PST014 TOOL)
1	PMUG1018A	GNSS REMOTE RECEIVER ASSY
1	DLN1447A	FRE: DSC 8500 W/ RUBIDIUM
1	PMHN4398AS	FAN ASSEMBLY SERVICE KIT,DSC8000
1	DLN8061A	FRU: DBR MCPA 800 MHZ
1	DLN8065A	FRU: XCVR 7/800 MHZ
1	DLN8032A	FRU: DBR MCPA FAN KIT
1	DLN8042A	FRU: DBR FAN FILTER REPLACEMENT KIT

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Motorola Solutions

1	DLN8063A	FRU: SITE RMC 7/800 MHZ
1	DLN8064A	FRU: CABINET RMC 7/800 MHZ
1	DLN8066A	FRU: 2-3 WAY COMBINER 800 MHZ
1	DLN8068A	FRU: 4-6 WAY COMBINER 800 MHZ
1	DLN8070A	FRU: 2-3 WAY SPLITTER 800 MHZ
1	DLN8072A	FRU: 4-6 WAY SPLITTER 800 MHZ
1	DLN8074A	FRU: PRESELECTOR 7/800 MHZ
1	DLN8075A	FRU: POSTFILTER 800 MHZ
1	DLN8077A	SOFTWARE,ON-PREMISES SOFTWARE HUB SW
1	DS440030221	TTA 440, MOTOROLA TOWER TOP UNIT, 794-824 MHZ, 4.3-10 CONNS, AUTOQUAD
1	DS440037633	TTA 440, MOTOROLA CU (ESS), 794-824 MHZ, BYPASS, TEST PORT, 2DC, 4.3-10 TTA CONNECTORS
1	DSDS8A03CS36UN	800 CONTROL STATION ANTENNA. 3 DBD
1	DSDS7C11PPYU6M	764-869 MHZ 11 DB GAIN 8' PANEL LOW-PIM/PIP, OFFSET, 4.3-10 CONNECTOR, 6-DEG DT
1	DSDS7C12P36UM	764-869MHZ ANTENNA, OMNIDIRECTIONAL 11.5 DBD, LOW-PIM/HI-PIP, 4.3-10 FEMALE
1	DSDS7C10P36U3M	764-869 MHZ, SINGLE ANTENNA, OMNIDIRECTIONAL, 10 DB GAIN, LOW-PIM/HI-PIP, 4.3-10 FEMALE, 3 DEG DT
1	DSDS7C08PPVU6M	764-869 MHZ 8 DB GAIN 4' PANEL LOW-PIM/PIP, BI-DIR, 4.3-10 CONNECTOR, 6-DEG DT
1	DSCS74860805SN	HYBRID CONTROL STATION COMBINER, 746-869 MHZ 8 CH.
1	SQM01SUM0320A	VIRTUALIZED PRIME SITE
1	CA03524AA	ADD: NEW PRIME SITE
1	CA03525AA	ADD: HW SUPPORT UP TO 18 CARRIERS
1	CA03529AA	ADD: INT. GPS TIMING REFERENCE W/ RUBIDIUM
1	CA03532AA	ADD: PRIME SITE DC POWER
1	CA03873AA	ADD: SYSTEM RELEASE AN2024.X
10	UA00702AA	ADD: TRUNKING MULTISITE VOTING LICENSE, PER CARRIER
1	UA00704AA	ADD: MULTISITE PRIME TRUNKING LICENSE
4	UA00706AA	ADD : TDMA VOTING LICENSE, PER CARRIER

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Motorola Solutions

1	UA00707AA	ADD: DSC INTERNAL RUBIDIUM LICENSE
1	CA03546AA	ADD: SINGLE JUNIPER SRX1500 ROUTERS FOR GEO REDUNDANT
1	CA03546AA-P	ADD: SINGLE JUNIPER SRX1500 ROUTERS FOR GEO REDUNDANT PRICE
1	CA03552AA	ADD: SINGLE BACKHAUL SWITCH
1	CA03552AA-P	ADD: SINGLE BACKHAUL SWITCH PRICE
2	DSIX2L1M1DC48IG	SITE EQUIPMENT,PD, HPD GPS DATA LINE, 48VDC, HARD WIRE WITH ISOLATED GROUNDING
2	DSP04268	ALUMINUM 6061-T6. PIPE 1 INCH SCHED 40
2	DSWM4	HEAVY DUTY W STYLE WALL MOUNT WITH 4 INCH STAND-OFF
2	CB001133A05	CABLE,ASTRO: 125' REMOTE GPS CABLE
2	PMUG1018A	GNSS REMOTE RECEIVER ASSY
1	SQM01SUM0320A	VIRTUALIZED PRIME SITE
1	CA03524AA	ADD: NEW PRIME SITE
1	CA03525AA	ADD: HW SUPPORT UP TO 18 CARRIERS
1	CA03529AA	ADD: INT. GPS TIMING REFERENCE W/ RUBIDIUM
1	CA03532AA	ADD: PRIME SITE DC POWER
1	CA03873AA	ADD: SYSTEM RELEASE AN2024.X
10	UA00702AA	ADD: TRUNKING MULTISITE VOTING LICENSE, PER CARRIER
1	UA00708AA	ADD: MULTISITE GEO-REDUNDANT PRIME TRUNKING LICENSE
4	UA00706AA	ADD : TDMA VOTING LICENSE, PER CARRIER
1	UA00707AA	ADD: DSC INTERNAL RUBIDIUM LICENSE
1	CA03546AA	ADD: SINGLE JUNIPER SRX1500 ROUTERS FOR GEO REDUNDANT
1	CA03546AA-P	ADD: SINGLE JUNIPER SRX1500 ROUTERS FOR GEO REDUNDANT PRICE
1	CA03552AA	ADD: SINGLE BACKHAUL SWITCH
1	CA03552AA-P	ADD: SINGLE BACKHAUL SWITCH PRICE
2	DSIX2L1M1DC48IG	SITE EQUIPMENT,PD, HPD GPS DATA LINE, 48VDC, HARD WIRE WITH ISOLATED GROUNDING
2	DSP04268	ALUMINUM 6061-T6. PIPE 1 INCH SCHED 40
2	DSWM4	HEAVY DUTY W STYLE WALL MOUNT WITH 4 INCH STAND-OFF

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2	CB001133A05	CABLE,ASTRO: 125' REMOTE GPS CABLE
2	PMUG1018A	GNSS REMOTE RECEIVER ASSY
1	T8555A	EDGE & HUB ROUTER & FIREWALL - DC
1	CA03445AA	ADD: MISSION CRITICAL HARDENING
1	CA03448AA	ADD: STATEFUL FIREWALL
1	DLN8021A	FRU: SRX1500 DC SWAPPABLE POWER SUPPLY
1	CLN9066A	NETWORK SWITCH, JUNIPER EX4100 24-PORT NON TAA
1	CLN9105A	CABLE FRU, 1 METER JUNIPER DAC CABLE
1	DSIX2L1M1DC48IG	SITE EQUIPMENT,PD, HPD GPS DATA LINE, 48VDC, HARD WIRE WITH ISOLATED GROUNDING
1	PMUG1018A	GNSS REMOTE RECEIVER ASSY
1	DLN1445B	FRE: DSC 8000, W/ RUBIDIUM 28-60V

Consolettes for use as Backup Control Stations at Dispatch Sites

QTY	NOMENCLATURE	DESCRIPTION
14	L37TSS9PW1CN	ALL BAND CONSOLETTE CN
14	G851AG	ADD: AES/DES-XL/DES-OFB ENCRYP APX AND ADP
14	GA00469AA	SOFTWARE LICENSE ENH:EXTENDED DISPATCH APX CONSOLETT
14	CA01598AB	ADD: AC LINE CORD US
14	G51AT	SOFTWARE LICENSE ENH:SMARTZONE
14	GA05508AA	DEL: DELETE VHF BAND
14	GA05509AA	DEL: DELETE UHF BAND
14	L999AG	ADD: FULL FP W/E5/KEYPAD/CLOCK/VU
14	G806BL	SOFTWARE LICENSE ENH: ASTRO DIGITAL CAI OP APX
14	W969BG	SOFTWARE LICENSE ENH: MULTIKEY OPERATION
14	GA00580AA	ADD: TDMA OPERATION
14	G361AH	SOFTWARE LICENSE ENH: P25 TRUNKING SOFTWARE APX
14	GA00318AB	ADD: 5Y ESSENTIAL SERVICE
14	HKN6233C	MOBILE RADIO APX CONSOLETTE RACK MOUNT KIT

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IMW to support Outdoor Location Service		
QTY	**NOMENCLATURE**	**DESCRIPTION**
1	SQM01SUM0257A	INTELLIGENT MIDDLEWARE
1	CA03607AA	ADD: IMW NON-REDUNDANT HIGH TIER SERVER
1	CA03607AA-P	ADD: IMW NON-REDUNDANT HIGH TIER SERVER PRICE
1000	UA00788AA	IMW PRESENCE (PER USER)
1000	UA00792AA	IMW LOCATION (PER USER)
1	CA02354AA	ADD: ASTRO NETWORK INTERFACE
1	CA02053AE	ADD: SUPPLEMENTAL CD IA (IMW)
1	CA02362AE	ADD: MCAFEE STANDALONE ANTI VIRUS SOFTWARE
1	CA02384AE	ADD: INTELLIGENT MIDDLEWARE SOFTWARE
KMF to Support OTAR/OTEK		
QTY	**NOMENCLATURE**	**DESCRIPTION**
1	T8749A	ASTRO KEY MANAGEMENT FACILITY
1	ZA01180AA	ADD: KMF SERVER AND WEB CLIENT SW
1	CA04100AA	ADD: WINDOWS SERVER 2016 SOFTWARE
1	SQM01SUM0222A	KMF CRYPTR
1	CA03840AA	KMF CRYPTR SW OPTION FOR KMF W VER R10.02.XX OR LATER
1	CA00182AV	ADD: AES 256 ENCRYPTION KIT
1	CA00143AF	ADD:DES OFB ENCRYPTION KIT
1	CA02066AA	ADD: AC LINE CORD, NORTH AMERICA
1	TKN9285A	RACK MOUNT KIT FOR CRYPTR II
1	TT4270B	Z2 MINI G9 WORKSTATION GEN14 PROCESSOR

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1	CLN9066A	NETWORK SWITCH, JUNIPER EX4100 24-PORT NON TAA

Add DSR-based Redundancy for Critical Connect and WAVE Broadband Interoperability		
QTY	**NOMENCLATURE**	**DESCRIPTION**
1	SQM01SUM0284C	WAVE SERVER HARDWARE
2	SQM01SUM0292A	CRYPTR
2	CA02066AA	ADD: AC LINE CORD, NORTH AMERICA
2	CA02934AA	ADD: OTEK
2	CA02954AA	ADD: SECURE OPERATION
2	CA02933AA	ADD: ASTRO AES 256, DES-OFB, ADP ENCRYPTION KIT
1	SQM01SUM0323A	ASTRO MASTER SITE
1	CA03517AB	ADD: CORE EXPANSION
1	CA03713AA	ADD: CRITICAL CONNECT LMP
1	T8910A	JUNIPER SRX 345 FIREWALL WITH SSD NON-TAA

Add (1) Incremental TDMA Channel License at All RF and Prime Sites		
QTY	**NOMENCLATURE**	**DESCRIPTION**
4	UA00869AA	ADD: P25 TDMA SOFTWARE
2	UA00706AA	ADD : TDMA VOTING LICENSE, PER CARRIER

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City of Fort Lauderdale

Attachment 9 - Information about Service and Support

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.1.4.5 Information about Service and Support

Implementation Preliminary Statement of Work

1.1 Overview

This Statement of Work (SOW) describes the deliverables to be furnished to the City of Fort Lauderdale. The tasks described herein will be performed by Motorola Solutions, its subcontractors, and the City of Fort Lauderdale to implement the solution described in the System Description. It describes the actual work involved in installation, identifies the installation standards to be followed, and clarifies the responsibilities for Motorola Solutions, and the City of Fort Lauderdale during the project implementation. Specifically, this SOW provides:

- A description of the responsibilities for Motorola Solutions, and the City of Fort Lauderdale.
- A preliminary implementation timeline, which would be dependent on the timely development of the Future State of Florida Site by the City of Fort Lauderdale.
- The assumptions taken into consideration during the development of this project.

This SOW provides the most current understanding of the work required by all parties to ensure a successful project implementation. In particular, Motorola Solutions has made assumptions of the sites to be used for the new system based on the sites mentioned in the RFP. Should any of the sites change, a revision to the SOW and associated pricing will be required. It is understood that this SOW is a working document, and that it will be revised as needed to incorporate any changes associated with contract negotiations, and any other change orders that may occur during the execution of the project.

1.2 Implementation Approach

1.2.1 A Phased Approach to Implementation

Motorola will provide Fort Lauderdale with an implementation approach that includes the following categories. A preliminary migration plan is included in Section 3.44.1. The final mutually agreed migration plan directly impacts the preliminary performance schedule and sequence of the work efforts.

- Project Initiation and Kickoff Meeting.
- Detailed Design Development and Review.
- Site Development.
- Fleetmap Development (If new subscribers are procured as part of the bid).
- Frequency Planning.

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- Order Processing and Manufacturing.
- Factory Configuration (Staging).
- Fixed Network Equipment Installation.
- Microwave and MPLS Integration.
- Additional Requirements Identified in RFP:
- Critical Connect link Broadband Gateway.
- Subscriber Radio Installation and Radio Programming (If new subscribers are procured as part of the bid)..
- System Integration and Optimization.
- Field Acceptance Tests.
- Training.
- 30–Day Infrastructure Reliability and Burn-in.
- Cutover.

Project Initiation, Kickoff, and Design Review

Motorola has provided an RFP–compliant design, which serves as a baseline for the design review. The Design Review encompasses the design finalization of the major subsystems, such as finalization of the site requirements, coverage design, and FAA & FCC licensing tasks. Additionally, during this review, we will work closely with the City of Fort Lauderdale to finalize a detailed cutover plan to transition to the new communications system. At the end of the design review phase, detailed design documents will be provided to the City of Fort Lauderdale.

Site Development Review

The detailed SOW provides an overview of site deliverables and responsibilities for both Motorola and the City of Fort Lauderdale during the project implementation.

Prior to the completion of the Customer Design Review (CDR), our implementation team will visit all existing sites that will be used for City of Fort Lauderdale’s system and will provide a detailed R56 audit.

Customer Design Review

At the CDR, Motorola will submit the following to the City of Fort Lauderdale:

- Heat load calculations
- Electrical load calculations
- Equipment enclosure drawings
- Site layout
- Antenna placement drawing
- Grounding layout.

On approval of the site design documentation and drawings, and on issuance of notice to proceed by City of Fort Lauderdale, our team will move forward with the project. Motorola will conduct a final site inspection along with a City of Fort Lauderdale representative for its readiness to install radio communications equipment.

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Motorola and City of Fort Lauderdale shall review and finalize a mutually agreeable performance schedule, reflecting the final agreed CDR requirements. Motorola reserves the right to reasonably extend the schedule without penalty for causes such as acts of God, force majeure events, City of Fort Lauderdale -caused delays or other delays outside of Motorola's' reasonable ability to control or impact (such as NEPA/SHPO). Motorola shall make a reasonable effort to mitigate, reduce timing impacts, and costs resulting from such delays.

Order Processing, Manufacturing, Staging, and Factory Testing

Equipment manufacturing is followed by factory staging of the radio infrastructure at Motorola's' new, state-of-the-art Elgin Experience Center—System Integration (EEC SI) in Elgin, Illinois. Factory staging provides for the initial assembly and testing of all radio system components. Factory staging will allow complete testing of the functional capabilities of the communications system.

Motorola will invite City of Fort Lauderdale to witness EEC SI staging on mutual agreement that site development works are sufficiently near readiness for fixed network installation. A mutually agreed milestone plan will be determined during the CDR.

Motorola will stage all-new ASTRO 25 equipment, which will provide a high ability to verify the system functionality of the new equipment. This process will allow City of Fort Lauderdale to witness factory testing in a controlled environment, as well as provide for a smooth and easy field installation.

1.2.1.1.1 Installation and Testing

Motorola's' implementation team will install, optimize, and test the system at the defined sites as staged at EEC SI. Our implementation plan includes the integration of all proposed subsystems to provide an end–to–end solution; with the exception of the microwave system which will be tested separately at the microwave manufacturer's facility. To verify the delivered system's functionality, Motorola will execute acceptance testing according to an Acceptance Test Plan (ATP). The ATP is a multi-stage plan that includes Factory Testing and Staging, Functional Acceptance Testing, Coverage Acceptance Testing, and 30–Day Reliability Burn-in Period.

1.2.1.1.2 Training and Migration

Following Functional Acceptance Testing, Motorola and City of Fort Lauderdale will begin migration to the new system in accordance with the mutually agreed final migration plan. Motorola and City of Fort Lauderdale will coordinate training with the parallel implementation and migration schedule to ensure a smooth transition to the new communications system.

1.2.1.1.3 Final Acceptance and Warranty Support

The final steps to full system implementation are the delivery of system documentation, punch list resolution, and final acceptance. The project team and the post-acceptance service team will work with City of Fort Lauderdale during this phase to ensure a smooth transition to the post-acceptance support period.

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Tasks	Motorola Solutions	City of Fort Lauderdale
PROJECT INITIATION		
Contract Finalization and Team Creation		
Execute contract and distribute contract documents.	X	X
Furnish a performance bond in the full amount of the contract price as security for the faithful performance of Motorola Solutions' contractual obligations.	X	
Purchase the required performance bond.	X	
Furnish a payment bond.	X	
Furnish a bid bond.	X	
Assign a Project Manager as a single point of contact.	X	X
Assign resources.	X	X
Schedule project kickoff meeting.	X	X
Deliverable: Signed contract, defined project team, and scheduled project kickoff meeting.		
Project Administration		
Ensure that project team members attend all meetings relevant to their role on the project.	X	X
Set up the project in the Motorola Solutions information system.	X	
Record and distribute project status meeting minutes.	X	
Maintain responsibility for third-party services contracted by Motorola Solutions.	X	
Complete assigned project tasks according to the project schedule.	X	X
Submit project milestone completion documents.	X	
Upon completion of tasks, approve project milestone completion documents within 7 to 10 business days.		X
Conduct all project work Monday thru Friday, 8 a.m. to 5:00 p.m. local time with the exception of Motorola Solutions' and the Customer's holidays.	X	
Deliverable: Completed and approved project milestones throughout the project.		

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Project Kickoff		
Introduce team, review roles, and decision authority.	X	X
Present project scope and objectives.	X	
Review SOW responsibilities and project schedule.	X	X
Schedule Design Review.	X	X
Deliverable: Completed project kickoff and scheduled Design Review.		
Design Review		
Review the Fort Lauderdale's operational requirements.	X	X
Present the system design and operational requirements for the solution.	X	
Present installation plan.	X	
Present preliminary cutover plan and methods to document final cutover process.	X	
Present configuration and details of sites required by system design.	X	
Mutually Validate that Customer sites can accommodate proposed equipment.	X	X
Provide all approvals required to add the proposed equipment at the proposed sites		X
Review safety, security, and site access procedures.	X	
Present equipment layout plans and system design drawings.	X	
Provide backhaul performance specifications and demarcation points.	X	
Provide heat load and power requirements for new equipment.	X	
Provide information on existing system interfaces (if any).		X
Provide frequency and radio information for each site.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X
Assume liability and responsibility for providing all information necessary for complete installation.		X
Assume responsibility for issues outside of Motorola Solutions' control.		X
Complete the required forms required for frequency coordination and licensing.	X	
Ensure that frequency availability and licensing meet project requirements, and pay licensing and frequency coordination fees.	X	

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Get any waivers and/or letter of concurrences required based on the proposed design contours for approval from FRIPS/FCC for licensing.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X
Mutually agree and define City of Naperville's requirement threshold for purposes of initiating Motorola ASTRO 25 system staging.	X	X
City of Fort Lauderdale provides Notice To Proceed (NTP) for project schedule to initiate.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X
Review and update design documents, including System Description, Statement of Work, Project Schedule, and Acceptance Test Plan, based on Design Review agreements.	X	
Provide minimum acceptable performance specifications for customer provided hardware, software, LAN, WAN and internet connectivity.	X	
Execute Change Order in accordance with all material changes to the Contract resulting from the Design Review (if any).	X	
Deliverable: Finalized design documentation based upon "frozen" design, along with any relevant Change Order documentation.		
SITE PREPARATION AND DEVELOPMENT		
Site Access		
Provide site owners/managers with written notice to provide entry to sites identified in the project design documentation.		X
Maintain access roads in order to provide clear and stable entry to sites for heavy-duty construction vehicles, cement trucks and cranes. Ensure that sufficient space is available at the site for these vehicles to maneuver under their own power, without assistance from other equipment.		X
Deliverable: Access, permitting, and licensing necessary to install system equipment at each site.		
General Facility Improvements (for existing sites)		
Provide adequate HVAC, grounding, lighting, cable routing, and surge protection based upon Motorola Solutions' Standards and Guidelines for Communication Sites (R56) for the existing (3) sites.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X
Ensure the resolution of environmental and hazardous material issues at each site including, but not limited to, asbestos, structural integrity (tower, rooftop, water tank, etc.), and other building risks.		X
Ensure that electrical service will accommodate installation of system equipment, including isolation transformers, circuit breakers, surge protectors, and cabling for the (3) existing sites.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X
Provide obstruction-free area for the cable run between the demarcation point and system equipment.		X
Provide structure penetrations (wall or roof) for transmission equipment (e.g., antenna coaxial cables, waveguide for microwave radios, control station antennas etc.).	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X

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Supply interior building cable trays, raceways, conduits, and wire supports.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X
Pay for usage costs of power and generator fueling, both during the construction and installation effort, and on an ongoing basis.		X
Provide one-time mobilization of construction crews.	X	
Correct any **R56** deficiencies.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X
Transport removed site equipment to a location designated by Customer and within Customer's jurisdiction.	X	
Deliverable: Sites meet physical requirements for equipment installation.		
SYSTEM INSTALLATION		
Equipment Order and Manufacturing		
Create equipment order and reconcile to contract.	X	
Manufacture Motorola Solutions-provided equipment necessary for the system based on equipment order.	X	
Procure non-Motorola Solutions equipment necessary for the system.	X	
Deliverable: Equipment procured and ready for shipment.		
System Staging (<customer witnessed or NOT customer witnessed>)		
Ship all equipment needed for staging to Motorola Solutions' factory for staging.	X	
Provide information on existing system interfaces, room layouts, or other information necessary for the assembly to meet field conditions.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X
Set up and rack the solution equipment on a site-by-site basis, as it will be configured in the field at each of the sites.	X	
Cut and label the cables with to/from information to specify interconnection for field installation and future servicing needs.	X	
Complete the cabling/connecting of the subsystems to each other ("connectorization" of the subsystems).	X	
Assemble required subsystems to assure system functionality.	X	
Power up, load application parameters, program, and test all staged equipment.	X	
Confirm system configuration and software compatibility with the existing system.	X	
Inventory the equipment with serial numbers and installation references.	X	
Review and approve proposed Factory Acceptance Test Plan.		X

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Pay for travel, lodging, meals, and all incidental expenses for Customer personnel and representatives to witness the Factory Acceptance Testing for up to 5 personnel.	**X**	
Perform factory functional acceptance tests of system features	**X**	
Conduct site and system level testing.	**X**	
Perform system **burn-in 24 hours a day** during staging to isolate and capture any defects.	**X**	
Pack and ship the racked equipment to the field to finalize staging of equipment.	**X**	
Deliverable: System staged and ready for shipment.		
Equipment Shipment and Storage		
Provide a secure, temperature-controlled location for solution equipment to be warehoused for up to 8 months.	**X**	
Pack and ship solution equipment to the identified, or site locations.	**X**	
Receive solution equipment.	**X**	
Inventory solution equipment.	**X**	
Deliverable: Solution equipment received and ready for installation		
General Installation		
Deliver solution equipment to installation location.	**X**	
Coordinate receipt of and inventory solution equipment with designated contact.	**X**	
Install all proposed fixed equipment as outlined in the System Description based upon the agreed-upon floor plans, connecting audio, control, and radio transmission cables to connect equipment to the power panels or receptacles, and audio/control line connection points. Installation performed in accordance with R56 standards and state/local codes.	**X**	
Install all proposed fixed equipment as outlined in the System Description based upon the agreed-upon floor plans, connecting audio, control, and radio transmission cables to connect equipment to the power panels or receptacles, and audio/control line connection points. Installation performed in accordance with R56 standards and state/local codes.	**X**	
Provide connectivity test results to confirm specification compliance before equipment installation. • Layer 3 MPLS equipment is recommended for all links. • Provide 24-hour test compliance, per Motorola specification.	**X**	

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• Provide IT contact representative for backhaul-related requirements		
Provide system interconnections that are not specifically outlined in the system design, including dedicated phone circuits, microwave links, or other types of connectivity. For Eg: information on the MW link between the 2 dispatch locations. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET		X
Install and terminate all network cables between site routers and network demarcation points, including microwave, leased lines, and Ethernet.	X	
Provide, Install and terminate all cabling between MC-Edge and punch blocks installed on the wall or in the rack. Perform wiring for the Aux I/O controls such as Doors, Gates, Environmental alarm closures, etc. to the control punchblock.	X	
Connect existing, pre-wired auxiliary input/outputs to the proposed Motorola MC Edge input/output box, as needed. NOTE: The customer will provide wiring to allow for the connection in the dispatch room. NOTE: If any new wiring for input/outputs is needed at the dispatch site an additional quote can be provided. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET		X
Ensure that Type 1 and Type 2 AC suppression is installed to protect installed equipment. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET		X
Connect installed equipment to the provided ground system within 15 feet.	X	
Label Motorola-supplied equipment, racks, and cables.	X	
Perform preliminary audit of installed equipment to ensure compliance with requirements and R56 standards.	X	
Note any required changes to the installation for inclusion in the “as-built” system documentation.	X	
Ensure that the State of Florida Tower is constructed on time to prevent any schedule delays.		X
Remove, transport, and dispose of old equipment.	X	
Deliverable: Equipment installed.		
Site Link Assessment		
Verify site link performance, prior to the interconnection of the solution equipment to the link equipment. Site links will be tested once.	X	
Provide information on customer public Internet connection for evaluation purposes.		X
Evaluate customer’s network from an IT perspective.	X	
Deliverable: Site Link Assessment completed and findings are presented to the Customer.		

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Antenna and Transmission Line Installation		
Install antennas, including supplying and installing new side arm mounts. Unless otherwise noted, standard antenna mounts are included.	X	
Install tower top amplifiers.	X	
Install transmission lines required for the system.	X	
Provide structure penetrations for transmission equipment (e.g. antennas & microwave line.).	X	
Install microwave waveguide and lines, as applicable.	X	
Perform sweep tests on transmission lines.	X	
Provide and install attachment hardware for supporting transmission lines on antenna support structure.	X	
Supply and install ground buss bar at the bottom of each antenna support structure.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X
Deliverable: Antenna and Transmission Line installed.		
ASTRO 25 Core and Remote Site Installation and Configuration		
Install fixed equipment contained in the equipment list and system description.	X	
Provide backhaul connectivity and associated equipment for all sites to meet latency, jitter and capacity requirements.	X	
Configure ASTRO 25 system to support the new RF sites.	X	
Provide a list of subscriber IDs for loading into the Zone Controller.		X
Load subscriber IDs in the Zone Controller.	X	
Provide required radio ID and alias information to enable alias database setup for interface to consoles.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X
Integrate the RF sites into the system to ensure proper operation.	X	
Deliverable: ASTRO 25 core and remote site equipment installation completed.		
Console Installation and Configuration		
Provide console furniture and make room for new console installation.		X
Identify circuits for connection to console and a demarcation point located within 25 feet of the console interface.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X
Connect console to circuit demarcation points.	X	
Install the dispatch backroom rack(s) equipment with network equipment,	X	

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site controller, etc., as applicable.		
Install CommandCentral Hub and all associated console equipment at each position.	X	
Install peripheral console equipment in accordance with R56 standards and state/local codes.	X	
Develop templates for console programming.	X	
Perform console programming and configuration.	X	
Ensure there is enough space, power, and grounding available to install the proposed Console and Control station equipment as applicable. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET		X
Deliverable: Console equipment installation completed.		
Control Station Installation and Configuration		
Provide the locations of control stations and desk sets at each site.		X
Survey mounting locations and develop control station installation plan.	X	
Provide adequate space, grounding, and power for the control station installation.		X
Properly ground the cabling, which will be run to the outdoor antenna location using the least obtrusive method.	X	
Provide an elevated antenna mounting location, and adequate feed-line routing and support.		X
Provide and install standard antenna mounts.	X	
Install line (not greater than 100 feet in length) and antenna system (connectors, coax grounding kit, antenna and surge protection).	X	
Install RF local control stations identified in the equipment list.	X	
Provide existing control station codeplugs or provide a list of channels (and associated parameters) to program the proposed control stations. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET		X
Perform control station programming.	X	
Provide existing, installed/programmed control stations/consolettes (up to 14) with existing antenna and line and cabling to the backroom which can interface to the Motorola gateway in the backroom equipment rack.		X
Deliverable: Control station equipment installation completed.		
Microwave Installation		
Conduct path surveys for all microwave paths.	X	
Review path surveys with City of Naperville and update the project REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X	

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documentation as mutually agreed if a change is determined necessary		
Deliverable: Microwave Equipment installation completed and ready for optimization.		
3RD PARTY SOW (Copy paste from 3rd Party SOW)		
Review and approve revised project documentation and costs, if changes are determined to be necessary.	**X**	
Provide microwave frequency coordination. If the necessary spectrum for the proposed microwave solution cannot be coordinated by Motorola, then Motorola will advise City of Naperville what alternatives have been determined are available to City of Naperville.	**X**	
Install microwave and MPLS contracted elements as described in General Installation.	**X**	
Submittal of license requests to the FCC.	**X**	
Logging Recorder Installation and Configuration		
Provide logging recorder equipment and all associated services, including removal, re-location/installation and configuration, and the Motorola API, SDK, as needed.	**X**	
For the 3rd Party Logging Equipment - Work with their logging vendor to interface to the AIS using the API to meet their logging requirements and any other information logged in addition to the audio.	**X**	
Provide the interface to the logging equipment.	**X**	
Provide a routable IP network path from the Motorola Solutions' dispatch site LAN to the County's enterprise network and logging recorder.		**X**
Provide the Archiving Information Server, serving as the interface between the proposed ASTRO 25 radio system and the recorder.	**X**	
Verify the flow of clear and encrypted audio to the logging recorder as a precursor to functional acceptance testing.	**X**	**X**
Deliverable: Logging equipment installation and configuration completed.		
Critical Connect System Installation and Configuration		
Install proposed Critical Connect solution equipment in allocated rack space.	**X**	
Validate servers and network are ready for software load.	**X**	
Install software for Critical Connect Management, Media, Proxy, and WRG Server.	**X**	
Install and configure TLS Certificates.		**X**

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Install up to five of each of the Critical Connect client applications and train the customer how to install the remaining.	X	
Configure up to ten Critical Connect Users and Critical Connect Profiles and train the customer how to configure the remaining.	X	
Configure Critical Connect Communication Groups.	X	
Configure Critical Connect Interfaces for radio gateways.	X	
Provide knowledge transfer to end user.	X	
Deliverable: Critical Connect system installed and configured.		
Develop Console and User Radio Fleetmap (If Purchased as part of base system)		
Mutually review and determine modifications to existing fleetmap.	X	X
Review fleetmapping requirements with Customer, including user ID and talkgroup structures.	X	
Designate user group representatives for the user groups, to make timely decisions on their behalf.		X
Provide advisory input during fleetmap development.	X	
Develop templates (Up to 10).	X	
Participate in a meeting to finalize any changes among user groups.	X	X
Review and approve fleetmap templates.		X
Program the approved templates into a radio-programming template tool.	X	
Program sample radios with approved templates and deliver for evaluation by Customer.	X	
Program approved templates into console.	X	
Evaluate sample radios and provide feedback.		X
Approve templates.		X
Deliverable: Fleetmap plan completed and approved by Customer.		
Mobile Radio Installation and Programming (If Purchased as part of base system)		
Develop and approve prototypes for each type of mobile installation.	X	
Test features and functionalities of the mobile templates.	X	
Program the mobile radios identified in the equipment list in accordance with the programming templates, client software, and fleetmap. A “one-time only” programming is included in the project pricing.	X	

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Provide at least (4) vehicles for installations according to the project/installation schedule.		**x**
Perform RF alignment and Install all the mobiles in the vehicles, as identified in the equipment list, and according to the installation schedule. ▪ Dash mount - Qty {{X}} ▪ Remote mount - Qty {{Y}} ▪ Vehicle Type A - Qty {{Z}} ▪ Vehicle Type B - Qty {{W}}	**X**	
Permanently mount the antennas on each vehicle according to the approved prototype, appropriate for the vehicle type. Install the antennas close to the same location as the existing antennas, where practical, in vehicles that already have antennas installed. If applicable, plug the old antenna hole with an appropriate rubber plug.	**X**	
Install the antennas on the roof, where practical, on the new antenna installations. If a mobile antenna cannot be installed on the roof, determine an alternative location.	**X**	**X**
Remove the existing mobiles from the vehicle at the time of installation of the new radios	**X**	
Prior to subscriber flash upgrade, perform all appropriate preventative maintenance on the subscriber radios, including calibration and tuning to ensure the radios are operating within manufacturer's specifications.	**X**	
Include radio flashing process.	**X**	
Deliverable: Mobile radios installed and accepted		
Portable Radio Programming and Distribution (If Purchased as part of base system)		
Pass all features and functionalities of the portable radio template.	**X**	
Define where the programming or flashing will be done. If it is done at the shop then the customer delivers the Portable Radios per the agreed-upon schedule.		**X**
Program test portable radios with each template version and activate them on the system.	**X**	
Program the portable radios identified in the equipment list in accordance with the programming templates, client software, and fleetmap. Radio Management for 2 years as been included to aid with this at no additional cost.	**X**	
Deliver portable radios to authorized Customer personnel and inventory upon receipt.	**X**	
Acknowledge receipt of portable radios and accessories and verify proper operation of a sampling of delivered portable radios.		**X**
Distribute portable radios to end users.	**X**	**X**

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Deliverable: Portable radios accepted and distributed.		
Install Radio Management Software		
Motorola Solutions will be responsible for the installation of Radio Management Software.	X	
Provide customer specification of hardware, software and network requirements for installation.	X	
Provide IT network requirements as outlined by Motorola Solutions.		X
Provide hardware, software and network requirements needed for Radio Management per specifications from Task Motorola Solutions.		X
Deliverable: Fixed Network Equipment installation completed and ready for optimization.		
Internet Bandwidth Assessment		
Assess the customer Internet and access. Document Internet access information	X	
Firewall Protection Evaluation and Compatibility requirements assessment.	X	
Perform site testing or evaluations.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X
Provide information on customer public Internet connection for evaluation purposes.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X
Deliverable: Internet Bandwidth Assessment is assessed and findings are presented to the Customer.		
SYSTEM OPTIMIZATION AND TESTING		
R56 Site Audit		
Perform R56 site-installation quality-audits, verifying proper physical installation and operational configurations.	X	
Create site evaluation report to verify site meets or exceeds requirements, as defined in Motorola Solutions' R56 Standards and Guidelines for Communication Sites.	X	
Deliverable: R56 Standards and Guidelines for Communication Sites audits completed successfully.		
Electromagnetic Interference (EMI) Analysis		
Perform EMI analysis for the Motorola Solutions-supplied equipment. Note: Motorola Solutions is only responsible for interference caused by Motorola Solutions-provided transmitters to the Motorola Solutions-provided receivers. Should the proposed equipment experience interference, Motorola Solutions can be contracted to investigate the source and recommend solutions to mitigate the issue.	X	
Resolve any interference caused by equipment not supplied by Motorola Solutions.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X

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Deliverable: EMI analysis completed.		
Solution Optimization		
Verify that all equipment is operating properly and that all electrical and signal levels are set accurately.	**X**	
Verify that all audio and data levels are at factory settings.	**X**	
Verify communication interfaces between devices for proper operation.	**X**	
Ensure that functionality meets manufacturers' specifications and complies with the final configuration established during design review or system staging.	**X**	
Reconfigure and reoptimize 3rd party equipment that is not part of the Motorola Solutions scope of work.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	**X**
Deliverable: Completion of System Optimization.		
Functional Acceptance Testing		
Verify the operational functionality and features of the solution supplied by Motorola Solutions, as contracted.	**X**	
Witness the functional testing.		**X**
Document all issues that arise during the acceptance tests.	**X**	
If any major task for the system as contractually described fails during the Customer acceptance testing or beneficial use, repeat that particular task after Motorola Solutions determines that corrective action has been taken.	**X**	
Resolve any minor task failures before Final System Acceptance.	**X**	
Document the results of the acceptance tests and present for review.	**X**	
Review and approve final acceptance test results.		**X**
If any major task as contractually described fails, repeat that particular task after Motorola Solutions determines that corrective action has been taken.	**X**	
Document all issues that arise during the acceptance tests.	**X**	
Document the results of the acceptance tests and present to the Customer for review.	**X**	
Resolve any minor task failures before Final System Acceptance.	**X**	
Deliverable: Completion of functional testing and approval by Customer.		
30-Day Burn-in Testing		
Turn on the complete system, and monitor for the entire test duration.	**X**	

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Categorize failures as major and minor, based upon agreed definitions.	X	
If a major failure occurs, correct the problem and re-start the test.	X	
If a minor failure occurs, correct the problem, and continue the 30-day burn-in.	X	
Complete the 30-day burn-in test successfully and prepare the required reports.	X	
Review and approve the results of the test. Execute the 30-day burn-in test progress milestone.	X	X
Deliverable: Completion of 30-Day Burn-in testing and approval by Customer.		
Coverage Acceptance Testing		
Determine the required number of test vehicles for simultaneous testing of multiple service areas.	X	X
Perform coverage testing according to the Coverage Acceptance Test Plan (CATP), Submit test reports within the agreed period.	X	
For any area that fails, take corrective action.	X	
Retest any areas for which corrective action has been taken.	X	
Document all issues that arise during the coverage testing.	X	
Submit final test reports, according to the agreed period.	X	
Provide the required number of test vehicles, drivers, and resources to witness the coverage testing.	X	
Review and approve test results.		X
Deliverable: Completion of coverage testing and approval by Customer.		
Training		
Finalize schedule for training coursework.	X	
Provide a training facility.		X
Ensure that the training participants fulfill course prerequisites.		X
Conduct the training classes outlined in the Training Plan.	X	
Attend proposed training classes.		X
Deliverable: Training coursework completed.		

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Cutover		
Finalize Cutover Plan.	X	X
Calibrate and tune existing mobile and portable radios to ensure good working order.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X
Provide Motorola Solutions with user radio information for input into the system database and activation, as required.	REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET	X
Provide programming of user radios and related services (i.e. template building, re-tuning, testing and installations), as needed, during cutover period.		X
Conduct a cutover meeting with relevant personnel to address both how to mitigate technical and communication problem impacts to the users during cutover and during the general operation of the system.	X	
Notify the personnel affected by the cutover of the date and time planned for the cutover.	X	X
Provide ongoing communication with users regarding the project and schedule.	X	X
Cutover users and ensure that user radios are operating on the system.	X	X
Resolve punch list items, documented during the Acceptance Testing phase, in order to meet all the criteria for final system acceptance.	X	
Assist Motorola Solutions with resolution of identified punch list items by providing support, such as access to the sites, equipment and system, and approval of the resolved punch list items.		X
Deliverable: Migration to new system completed, and punch list items resolved.		
Transition to Warranty		
Review the items necessary for transitioning the project to warranty support and service.	X	
Motorola Solutions to provide services during year 3 warranty which align with the proposed services.	X	
Provide a Customer Support Plan detailing the warranty support associated with the contract equipment.	X	
Participate in the Transition Service/Project Transition Certificate (PTC) process.		X
Deliverable: Service information delivered and approved by Customer		
Finalize Documentation and System Acceptance		
Provide manufacturer's installation material, part list and other related material to Customer upon project completion.	X	

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Provide an electronic as-built system manual on CD or other Customer preferred electronic media. The documentation will include the following: ▪ Site Block Diagrams. ▪ Site Floor Plans. ▪ Site Equipment Rack Configurations. ▪ Antenna Network Drawings for RF Sites (where applicable). ▪ ATP Test Checklists. ▪ Functional Acceptance Test Plan Test Sheets and Results. ▪ Equipment Inventory List. ▪ Console Programming Template (where applicable). ▪ Maintenance Manuals (where applicable). ▪ Technical Service Manuals (where applicable). ▪ Drawings will be delivered in Adobe PDF format.	**X**	
Receive and approve documentation.		**X**
Execute Final Project Acceptance.	**X**	**X**
Deliverable: All required documents are provided and approved. Final Project Acceptance.		

NOTE: Final Project Acceptance shall be deemed successful when the ATP tests pass. The Customer and Motorola Solutions mark the event by signing and dating the Final System Acceptance milestone certificate.

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Motorola Solutions has multiple offices in the area of Fort Lauderdale, along with a very strong FSO organization within the 2 hour response time of the City of Fort Lauderdale. Motorola has **at least 13 FSO badged** employees that live within the 2 hour response time of the City. This team will easily be able to provide all the maintenance and support required by the City of Fort Lauderdale for their new radio system. Motorola also has many more full time badged employees within the City of Fort Lauderdale itself who can easily provide support in the initial installation, configuration, warranty and ongoing maintenance needs. More information about the service and support is presented in the Ongoing Maintenance and Support Program Description and Timeline attachment.

1.4 Assumptions

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

The following assumptions remain in need of review and verification as of the submission of this proposal. These assumptions affect the scope of responsibilities to ensure ancillary systems and facilities are fully prepared to support the solution contained in this proposal. Motorola will work with the customer to determine the validity of these assumptions and determine the increased scope for which Motorola and/or the customer is responsible. Should the customer prefer Motorola to assume responsibility for the increased scope, Motorola will prepare and submit to the customer a revised proposal or change order reflecting the revised scope, cost, and project implementation.

1 - Union Labor is not required.
2 - Prevailing Wages are not required.
3 - All existing sites or equipment locations will have sufficient space available for the system described as required/specified by R56.
4 - All existing sites or equipment locations will have adequate electrical power in the proper phase and voltage, and site grounding to support the requirements of the system described.
    - Electrician services are not included.
5 - All existing towers will have adequate space and size to support the antenna network requirements of the system described.
    - Any tower stress analysis or tower upgrade requirements are the responsibility of the Customer.
6 - Any site/location upgrades or modifications are the responsibility of the Customer.
7 - All Communication Sites can be accessed with a 4 wheel drive vehicle. Anything beyond the use of a 4 wheel drive vehicle will require a change order to capture the additional cost.
8 - Interfacing to 3rd party equipment or applications is not a part of this proposal.
9 - Approved local, State, or Federal permits as may be required for the installation and operation of the proposed equipment are the responsibility of the Customer.
10 - Any required system interconnections not specifically outlined here will be provided by the Customer. This may include dedicated phone circuits, microwave links, or other types of connectivity.
11 - Portable and mobiles used for coverage survey or testing will be provided by Customer.
12 - The system Radio coverage is design based on N50 radios with ¼ wave antennas.

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- Motorola Solutions is not responsible for interference caused or received by the Motorola Solutions-provided equipment except for interference that is directly caused by the Motorola Solutions-provided transmitter(s) to the Motorola Solutions-provided receiver(s). Should the Customer's system experience interference, Motorola Solutions can be contracted to investigate the source and recommend solutions to mitigate the issue.
- All sites are assumed to be land-accessible and no special transportation such as helicopter and the like is required to gain site access.

1.3 Preliminary Project Schedule

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Motorola's preliminary schedule indicates total project implementation to be approximately 18 months pending supply chain availability at the time of purchase. This preliminary schedule is included for informational purposes only and assumes that all responsibilities as defined above are completed, as required. If site improvements or site approvals are needed these must be completed prior to equipment shipping to the field.

1.4 Change Order Process

Either Party may request changes within the general scope of this Agreement. If a requested change causes an increase or decrease in the cost, change in system configuration or adds time to the project's timeline required to perform this Agreement, the Parties will agree to an equitable adjustment of the Contract Price, Performance Schedule, or both, and will reflect the adjustment in a change order. Neither Party is obligated to perform requested changes unless both Parties execute a written change order.

An example Change Order Form is provided on the following pages.

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1.5 Example Change Order

Change Order Number: _____

Date: _____

Project Name and Number: _____

Customer Name: _____

Customer Project Mgr: _____

The purpose of this Change Order is to: *(highlight the key reasons for this Change Order)*

Contract #: {{Required}} **Contract Date:** _____

In accordance with the terms and conditions of the contract identified above between

{{enter customer name}} and Motorola Solutions, Inc., the following changes are approved:

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Contract Price Adjustments

Original Contract Value:	$
Previous Change Order amounts for Change Order numbers {{####}} through {{[####}}.	$
This Change Order:	$
New Contract Value:	$

Completion Date Adjustments

Original Completion Date:	
Current Completion Date prior to this Change Order:	
New Completion Date:	

Changes in Equipment: *(additions, deletions or modifications)* **<Include attachments if needed>**

Scope of Work Changes: *(additions, deletions or modifications)***< Include attachments if needed>**

Changes in SUA and Support Services: *(additions, deletions or modifications)* **<Include attachments if needed. Must be completed by Project CSM>**

Schedule Changes: <*describe change or N/A*>

Pricing Changes: <*describe change or N/A*>

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Customer Responsibilities: ***<describe change or N/A>***

Payment Schedule for this Change Order: **<describe new payment terms applicable to this change order>**

Purchase Order Requirements for this Change Order (select only one).

☐ A Purchase Order is required - included with this change order and is attached.

☐ No Purchase Order is required - Customer affirms that this change order document is the only notice to proceed required, that funding has been encumbered for this change order in its entirety, and that no further purchase orders will be issued against this change order,

☐ No Purchase Order required - this is a $0 Change Order, or a decrease in scope.

Unless amended above, all other terms and conditions of the Contract shall remain in full force. If there are any inconsistencies between the provisions of this Change Order and the provisions of the Contract, the provisions of this Change Order will prevail.

IN WITNESS WHEREOF the parties have executed this Change Order as of the last date signed below.

Motorola Solutions, Inc.		**Customer**	
By:	_____	By:	_____
Printed Name:	_____	Printed Name:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____

Reviewed by: _____ Date: _____

Motorola Solutions Project Manager

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Section 2

RFP Section 3.1.4.5 Information about Service and Support

Civil Statement of Work

2.1 Utilities Site

2.1.1 Development at Utilities Site

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Site Scope Summary

- Engineering services for site drawings and permitting approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.

Motorola Responsibilities:

Site Engineering

- Conduct flood plain analysis of the site location.
- Prepare site construction drawings, showing the layout of various new and existing site components.
- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.
- Provide a structural engineering analysis for antenna support structure, if necessary, to support the proposed antenna system. If the tower structure fails the analysis, the cost of any site relocation or modifications to the tower required to support the antenna system will be the responsibility of Fort Lauderdale. NOTE: This task does not include mapping, structural measurement survey, materials testing, geotechnical investigation, and/or other field investigation to acquire the data. If applicable, these tasks will be noted separately in the SOW.
- Preparation, submission and tracking of application for local permit fees (electrical, building etc.) and procurement of information necessary for filing.

Site Preparation

- Obtain the permits such as electrical, building, and construction permits, and coordinate any inspections with local authorities that may be needed to complete site development work.

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- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.

Antenna and Transmission Line Installation

- Install 2 antenna(s) for the RF system.
- Install 2 stiff arms for antennas.
- Supply and install 2 heavy duty mount(s) for antennas.
- Supply and install 2 6-foot side arm(s) for antenna mounts.
- Install 1 tower top amplifier(s).
- Install up to 210 linear feet of 1/2-inch transmission line.
- Install up to 210 linear feet of 7/8-inch transmission line.
- Install up to 210 linear feet of 1-1/4-inch transmission line.
- Perform sweep tests on transmission lines.

Miscellaneous Work

- Electrical Upgrades and DC integrations

2.2 Points of America Site

2.2.1 Development at Points of America Site

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.

Motorola Responsibilities:

Site Engineering

- Prepare site construction drawings, showing the layout of various new and existing site components.
- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.
- Provide a structural engineering analysis for antenna support structure, if necessary, to support the proposed antenna system. If the structure fails the analysis, the cost of any site relocation or modifications to the tower required to support the antenna system will be the responsibility of Fort Lauderdale. NOTE: This task does not include mapping, structural measurement survey, materials testing, geotechnical investigation, and/or other field investigation to acquire the data. If applicable, these tasks will be noted separately in the SOW.
- Conduct site investigation necessary to develop structural analysis (cases where adequate as-built documentation is not provided).

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- Preparation, submission and tracking of application for local permit fees (zoning, electrical, building etc.) and procurement of information necessary for filing.

Site Preparation

- Obtain the permits such as electrical, building, and construction permits, and coordinate any inspections with local authorities that may be needed to complete site development work.
- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.

Antenna and Transmission Line Installation

- Install 2 antenna(s) for the RF system.
- Install 2 stiff arms for antennas.
- Supply and install 2 heavy duty mount(s) for antennas.
- Supply and install 2 6-foot side arm(s) for antenna mounts.
- Install 1 tower top amplifier(s).
- Install up to 75 linear feet of 1/2-inch transmission line.
- Install up to 75 linear feet of 7/8-inch transmission line.
- Install up to 75 linear feet of 1-1/4-inch transmission line.
- Perform sweep tests on transmission lines.

Existing Facility Improvement Work

- Coordinate interior Finish of the room after electrical upgrades completed, Patching existing walls floors etc. refinish repair or replace vinyl tiles on the floor as needed, and paint the walls and ceiling..
- Coordinate the installation of electrical subfeed with disconnect into the equipment room.
- Supply and install 1 200-amp breaker panel with capacity for 30 circuits.
- Supply and install 15 20-amp breakers in the distribution panel and wire to outlets located on an average within 35 cable feet.
- Supply and install 2 30-amp breakers in the distribution panel and wire to outlets located on an average within 35 cable feet.
- Supply and install 2 40-amp breakers in the distribution panel and wire to outlets located on an average within 35 cable feet.
- Install 1 Type 2 surge protector on electrical service side of the ATS.
- Install 1 primary Type 1 surge protector on the room electrical feed to protect the equipment from surges.
- Supply and install 24-inch-wide cable runway (up to 30 linear feet) inside the existing room.
- Ground all metallic objects in the interior of the existing room, to meet current Motorola’s Standards and Guidelines for Communications Sites (R56) requirements and terminate near equipment locations.
- Supply and install 1 wall-mounted 10-pound CO2 fire extinguisher and 1 wall-mounted 20-pound ABC fire extinguisher.
- Supply and install "No smoking" EME signage at the site.

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- Supply and install 1 eye wash station and 1 first aid kit.
- Supply wall mounted mini split HVAC unit
- Install air-conditioning unit controls and wire to breaker panel located within 50 cable feet of the air-conditioning unit.

Grounding Enhancement

- Bond all new mast, Antennas, Lines to existing Ground.

Miscellaneous Work

- Electrical Upgrades and DC integrations

2.3 Playa Del Sol Site

2.3.1 Development at Playa Del Sol Site

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.

Motorola Responsibilities:

Site Engineering

- Prepare site construction drawings, showing the layout of various new and existing site components.
- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.
- Provide a structural engineering analysis for antenna support structure, if necessary, to support the proposed antenna system. If the tower structure fails the analysis, the cost of any site relocation or modifications to the tower required to support the antenna system will be the responsibility of Fort Lauderdale. NOTE: This task does not include mapping, structural measurement survey, materials testing, geotechnical investigation, and/or other field investigation to acquire the data. If applicable, these tasks will be noted separately in the SOW.
- Conduct site investigation necessary to develop structural analysis (cases where adequate as-built documentation is not provided).
- Preparation, submission and tracking of application for local permit fees (electrical, building etc.) and procurement of information necessary for filing.

Site Preparation

- Obtain the permits such as electrical, building, and construction permits, and coordinate any inspections with local authorities that may be needed to complete site development work.

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- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.

Antenna and Transmission Line Installation

- Install 2 antenna(s) for the RF system.
- Install 2 stiff arms for antennas.
- Supply and install 2 heavy duty mount(s) for antennas.
- Supply and install 2 6-foot side arm(s) for antenna mounts.
- Install 1 tower top amplifier(s).
- Install up to 40 linear feet of 1/2-inch transmission line.
- Install up to 40 linear feet of 7/8-inch transmission line.
- Install up to 40 linear feet of 1-1/4-inch transmission line.
- Perform sweep tests on transmission lines.

Existing Facility Improvement Work

- Coordinate interior Finish of the room after electrical upgrades completed, Patching existing walls floors etc. refinish repair or replace vinyl tiles on the floor as needed, and paint the walls and ceiling..
- Coordinate the installation of electrical subfeed with disconnect into the equipment room.
- Supply and install 1 200-amp breaker panel with capacity for 30 circuits.
- Supply and install 15 20-amp breakers in the distribution panel and wire to outlets located on an average within 35 cable feet.
- Supply and install 2 30-amp breakers in the distribution panel and wire to outlets located on an average within 35 cable feet.
- Supply and install 2 40-amp breakers in the distribution panel and wire to outlets located on an average within 35 cable feet.
- Install 1 Type 2 surge protector on electrical service side of the ATS.
- Install 1 primary Type 1 surge protector on the room electrical feed to protect the equipment from surges.
- Supply and install 24-inch-wide cable runway (up to 30 linear feet) inside the existing room.
- Ground all metallic objects in the interior of the existing room, to meet current Motorola’s Standards and Guidelines for Communications Sites (R56) requirements and terminate near equipment locations.
- Supply and install 1 wall-mounted 10-pound CO2 fire extinguisher and 1 wall-mounted 20-pound ABC fire extinguisher.
- Supply and install "No smoking" EME signage at the site.
- Supply and install 1 eye wash station and 1 first aid kit.
- Supply wall mounted mini split HVAC unit
- Install air-conditioning unit controls and wire to breaker panel located within 50 cable feet of the air-conditioning unit.

Grounding Enhancement

- Bond all new mast, Antennas, Lines to existing Ground.

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Miscellaneous Work

- Electrical Upgrades and DC integrations

2.4 State Site

2.4.1 Development at State Site

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.
- New power run – 100 feet, Electrical service type – Underground, 400-amp - 120/240-volt, single-phase.
- New shelter size – 12-foot x 30-foot.
- New generator size – 50 kW, Type – Indoor.

Motorola Responsibilities:

Site Engineering

- Prepare site construction drawings showing the layout of various new and existing site components.
- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.
- Prepare record drawings of the site showing the as-built information.
- Conduct flood plain analysis of the site location.
- Conduct utility investigation and coordinate with local utility company for power hook up.
- Perform a boundary and topographic survey for the property on which the communication site is located or will be located.
- Perform construction staking around the site to establish reference points for proposed construction.
- Prepare, submit and track application for local permit fees (electrical, building etc.), prepare filings and procure information necessary for filing permitting.
- Perform geotechnical testing at the shelter foundation location.

Site Preparation

- Obtain the permits such as electrical, building, and construction permits, and coordinate any inspections with local authorities that may be needed to complete site development work.
- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.

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- Supply and install gravel surfacing to a depth of 6 inches, including herbicide treatment and geotextile fabric installation within the disturbed area in site compound 3-foot path around it (not to exceed 840 square feet).

Site Components Installation

- Construct 1 reinforced concrete foundation necessary for a 12' x 30' shelter.
- Construct 1 raised platform up to six foot above grade or as directed by final flood certification and or local building ordinances as well as Tusa spec.
- Supply and install 1 concrete shelter of size 12' x 30' x 9' Prefab Building.
- Supply and install 1 standby power generator (50 kW) located within 20 feet of the ATS, including interconnection wiring between the generator, transfer switch, and site electrical service mains.
- Supply and install 1 120/240-volt, 400-amp, single-phase meter pedestal and hookup for electrical service by the local utility.
- Provide all trenching, conduit, and cabling necessary for underground hookup of power to the shelter from nearby utility termination located within 100 cable feet of the shelter.
- Supply and install a perimeter grounding system around the compound and shelter. The ground system is to tie to the fence and all new metal structures within the compound to meet current Motorola's R56 standards.
- Conduct 1 three-point ground resistance test of the site. Should any improvements to grounding system be necessary after ground testing, the cost of such improvements shall be the responsibility of Fort Lauderdale.
- Supply and install 1 freestanding 24-inch-wide cable/ice bridge from the tower to the shelter (up to 20 linear feet).

Antenna Installations

- Install 3 antenna(s) for the RF system.
- Install 3 stiff arms for antennas.
- Supply and install 3 heavy duty mount(s) for ntennas.
- Supply and install 3 6-foot side arm(s) for antenna mounts.
- Install 1 tower top amplifier(s).
- Install up to 210 linear feet of 1/2-inch transmission line.
- Install up to 210 linear feet of 7/8-inch transmission line.
- Install up to 560 linear feet of 1-1/4-inch transmission line.
- Perform sweep tests on transmission lines.

Miscellaneous Work

- Electrical Upgrades and DC integrations

Customer Responsibilities:

- Provide personnel to observe construction progress and testing of site equipment according to the schedule provided by Motorola.
- As applicable (based on local jurisdictional authority), the Customer will be responsible for any installation or up-grades of the electrical system in order to comply with NFPA 70, Article 708

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- As required, provide property deed or lease agreement, and boundary survey, along with existing as-built drawings of the site and site components to Motorola for conducting site engineering.
- Provide a right of entry letter from the site owner for Motorola to conduct field investigations.
- Maintain existing access road in order to provide clear and stable entry to the site for heavy-duty construction vehicles, cement trucks and cranes. Sufficient space must be available at the site for these vehicles to maneuver under their own power, without assistance from other equipment.

Assumptions:

- All work is assumed to be done during normal business hours as dictated by time zone (Monday thru Friday, 7:30 a.m. to 5:00 p.m.).
- All recurring and non-recurring utility costs [including, but not limited to, generator fuel (except first fill), electrical, Telco] will be borne by the Customer or site owner.
- All utility installations shall be coordinated and paid for by the site owner and located at jointly agreed to location within or around the new communications shelter or equipment room.
- Site will have adequate electrical service. Utility transformer, transformer upgrades, line, or pole extensions have not been included.
- Pricing has been based on National codes such IBC or BOCA. Local codes or jurisdictional requirements have not been considered in this proposal.
- Hazardous materials are not present at the work location. Testing and removal of hazardous materials, found during site investigations, construction or equipment installation will be the responsibility of the customer.
- A maximum of 30 days will be required for obtaining approved building permit time of submission. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET
- No access road or staging area improvements are required for the heavy construction equipment which could include concrete trucks, drill rigs, semi tractors and trailers, and crane.
- If extremely harsh or difficult weather conditions delay the site work for more than a week, Motorola will seek excusable delays rather than risk job site safety.

Customer Responsibilities:

- Provide personnel to observe construction progress and testing of site equipment according to the schedule provided by Motorola.
- As applicable (based on local jurisdictional authority), the Customer will be responsible for any installation or up-grades of the electrical system in REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET NFPA 70, Article 708
- As required, provide property deed or lease agreement, and boundary survey, along with existing as-built drawings of the site and site components to Motorola for conducting site engineering. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET
- Provide a right of entry letter from the site owner for Motorola to conduct field investigations.

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- Maintain existing access road in order to provide clear and stable entry to the site for heavy-duty construction vehicles, cement trucks and cranes. Sufficient space must be available at the site for these vehicles to maneuver under their own power, without assistance from other equipment.
- Confirm that the existing generator where applicable, is sufficient to support the new equipment and ancillary equipment loads.
- If required, remove or relocate any existing facilities, equipment, and [illegible] space for new site facilities and equipment. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET
- If required, provide any physical improvements (walls, roofing, flooring, painting, etc.) necessary to house the equipment in the existing room.
- All sites except State Tower site, Supply required standby generator power to support the additional proposed equipment. This power source shall be adequate to back up all radio equipment, future equipment growth, and ancillary equipment such as, but not limited to, interior lighting, tower lighting and HVAC.
- Utilities Site, Supply any required UPS Power to s[illegible] proposed equipment. This uninterruptible power source sha[illegible]ck-up all radio equipment as well as future equipment growth. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET
- Supply dedicated 20 Amp simplex A. C. outlets at for each major piece of proposed equipment within six (6) feet of the equipment loc[illegible]ual breakers in distribution panels. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET
- Utilities Site, Provide support and entry facilities for the cables (cable la[illegible] entry ports, etc.) between the proposed equipment locations. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET
- Secure power connection to the room, associated permitting, and installation of a meter and disconnect within 50 feet of the proposed shelter location.

Assumptions:

- All work is assumed to be done during normal business hours as dictated by time zone (Monday thru Friday, 7:30 a.m. to 5:00 p.m.).
- All recurring and non-recurring utility costs [including, but not limited to, generator fuel (except first fill), electrical, Telco] will be borne by the Customer or site owner.
- All utility installations shall be coordinated and paid for by the site owner and located at jointly agreed to location within or around the new communications shelter or equipment room.
- Site will have adequate electrical service. Utility transforme[illegible]ades, line, or pole extensions have not been included. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET
- Pricing has been based on National codes such IBC or BOCA. Local codes or jurisdictional requirements have not been considered in this proposal.
- Hazardous materials are not present at the work location. Testing and removal of hazardous materials, found during site investigations, construction or equipment installation will be the responsibility of the customer.
- A maximum of 30 days will be required for obtaining appro[illegible]s from time of submission. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET
- No access road or staging area improvements are required for the heavy construction equipment which could include concrete trucks, drill rigs, semi tractors and trailers, and crane.

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- If extremely harsh or difficult weather conditions delay the site work for more than a week, Motorola will seek excusable delays rather than risk job site safety.
- Alarming at existing sites will be limited to new cor[illegible] and will have to be discussed and agreed to on a site-by-site basis
- The site will have adequate room for installation of proposed equipmen[illegible] applicable codes and Motorola's R56 standards.
- Utilities Site, The existing utility service and backup power facilities (UPS, generators) have sufficient extra capacity to support the proposed new equipment load.
- A clear obstruction-free access exists from the antenna location to the equipment room.
- Utilities Site, The Customer d[illegible]de of the existing site to meet Motorola's R56 standards.
- The floor can support the proposed new loading. Physical or structural improvements to the existing room will not be required.

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2.5 2200 Executive Airport Way

2.5.1 Development at 2200 Executive Airport Way

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.
- New fenced compound/expansion size – 30-foot x 30-foot.
- Clearing type – Light.
- New tower to be used for antennas – 80-foot monopole tower.
- New tower foundation size – 20 cubic yard, Type – Drilled Pier.

Motorola Responsibilities:

Site Engineering

- Prepare site construction drawings showing the layout of various new and existing site components.
- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Perform a site and topographic survey for the property on which the communication site is located or will be located.
- Prepare a lease exhibit and sketch of the site to communicate to the property owner the proposed lease space and planned development at the particular site location.
- Prepare record drawings of the site showing the as-built information.
- Perform construction staking around the site to establish reference points for proposed construction.
- Perform NEPA Threshold Screening, including limited literature and records search and brief reporting, as necessary to identify sensitive natural and cultural features referenced in 47 CFR Chapter 1, subsection 1.1307 that may potentially be impacted by

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the proposed construction activity. This does not include the additional field investigations to document site conditions if it is determined that the proposed communication facility “may have a significant environmental impact” and thus require additional documentation, submittals, or work. Regional Environmental Review (RER) report submittals if required by FEMA have not been included. Perform Cultural Resource study as needed to identify sensitive historical and archaeological monuments that might be impacted by proposed construction activity.

- Conduct up to 40-foot deep soil boring test at tower location and prepare report of soil conditions at the location of monopole tower foundation.

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- Conduct construction inspection of foundation steel prior to pour, materials testing of concrete and field density tests of backfill to ensure quality construction.
- Check tower erection for plumbness, linearity and alignment after installation.
- Perform inspection of the site and the work performed by the Contractor to document that the site is built in accordance with the “Site Plans” and document any deviations or violations.
- Prepare, submit and track application for local permit fees (electrical, building etc.), prepare FAA filings and procure information necessary for filing.

Site Preparation

- Obtain the permits such as electrical, building, and construction permits, and coordinate any inspections with local authorities that may be needed to complete site development work.
- Provide one-time mobilization costs for the construction crews. Any remobilization due to interruptions/delays that are out of Motorola's control will result in additional costs.
- Perform light clearing of brush, grubbing and disposal of vegetation and shrub growth in the site compound area and a 20-foot path around it (4900 square feet).
- Grade the site compound and 10-foot path around it to provide a level, solid, undisturbed surface for installation of site components (not to exceed 2500 square feet).
- Supply and install gravel surfacing to a depth of 6 inches, including herbicide treatment and geotextile fabric installation within the fenced in site compound area, and a 3-foot path around it (not to exceed 1296 square feet).
- Provide silt fence around the compound to control soil erosion (not to exceed 120 linear feet).
- Supply and install 8-foot high chain-link fencing with a ten-foot wide gate around the shelter compound (not to exceed 120 linear feet).
- Perform site touch up (fertilize, seed and straw) disturbed areas not covered with gravel after completion of construction work. Landscaping, decorative fencing or any other aesthetic improvement that may be required by local jurisdictions has not been included and will be handled through a negotiated contract change notice.

Site Components Installation

- Supply and install a perimeter grounding system around the tower The ground system is to tie to the fence and all new metal structures within the compound to meet current Motorola’s R56 standards.

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- Supply and install 1 freestanding 24-inch-wide cable/ice bridge from the tower to the shelter (up to 20 linear feet).

Tower Work

- Construct drilled pier type tower foundations including excavation, rebar and concrete (not to exceed 20 cubic yards).
- Erect new 80-foot monopole tower.
- Supply and install grounding for the towerbase for monopole or guyed towers

Miscellaneous Work

- Defrag Tank and slurry removals
- Spoils removal and hauling to an approved dump location.
- Crane and Rigging to set Mono Pole

Customer Responsibilities:

- Provide personnel to observe construction progress and testing of site equipment according to the schedule provided by Motorola.
- As applicable (based on [illegible]uthority), the Customer will be responsible for any installation or up- [illegible]cal system in order to comply with NFPA 70, Article 708 REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET
- As required, provide property deed or lease agreement, and boundary survey, along with existing as-built drawings of the site and site components to Motorola for conducting site engineering.
- Provide a right of entry letter from the site owner for Motorola to conduct field investigations.
- Maintain existing access road in order to provide clear and stable entry to the site for heavy-duty construction vehicles, cement trucks and cranes. Sufficient space must be available at the site for these vehicles to maneuver under their own power, without assistance from other equipment.
- Conduct all the testing and d[illegible]n tests, photo simulations, zoning application, expert testimony[illegible].) required for the zoning the proposed new tower sites. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET
- Provide additional temporary space for staging of the construction equipment during the construction of new site facilities (tower, shelter, generator, fuel tank etc.).
- If required, remove or relocate any existing facilities, equipment, and utilities to create space for new site facilities and equipment.
- Supply dedicated 20 Amp simplex A. C. [illegible]ajor piece of proposed equipment within six (6) feet of the equip[illegible]to individual breakers in distribution panels. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET
- Provide support and entry facilities for [illegible]dder/chaseway, entry ports, etc.) between the proposed equipmen REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Assumptions:

- All work is assumed to be done during normal business hours as dictated by time zone (Monday thru Friday, 7:30 a.m. to 5:00 p.m.).

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- Pricing has been based on National codes such IBC or BOCA. Local codes or jurisdictional requirements have not been considered in this proposal.
- Hazardous materials are not present at the work location. Testing and removal of hazardous materials, found during site investigations, construction or equipment installation will be the responsibility of the customer.
- A maximum of 30 days will be required for obtaining REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET ermits from time of submission.
- No access road or staging area improvements are required for the heavy construction equipment which could include concrete trucks, drill rigs, semi tractors and trailers, and crane.
- If extremely harsh or difficult weather conditions delay the site work for more than a week, Motorola will seek excusable delays rather than risk job site safety.
- In absence of geotechnical reports, foundations and subsurface conditions for tower design are based on Presumptive Sand soil parameters, as defined by EIA-222-H . Also, rock coring, piling, extensive dewatering of foundations, permanent casings or hazardous material removal has not been included.
- The new tower location will pass the FAA hazard study, zoning, FCC and environmental permitting.
- The restoration of the site surroundings by fertilizi REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET wing the disturbed areas will be adequate.
- Tower and foundation sizing is based on the tower loading requirements as a result of the RF Antenna System design and the REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET a System design (i.e. - dish sizes and locations obtained from pape er physical path studies, the dish sizes and locations change, then Motorola will then review the impact to tower structure and foundations and revise applicable costs.
- If as a result of NEPA studies, any jurisdictional authority should determine that a proposed communications facility "may have a significant environmental impact", the environmental impact studies or field testing and evaluation related to such determination have not been included.
- The site location can be finalized and lease agreement can be reached with the property owner within 60 calendar days after the start of the site acquisition effort.
- A waiver to zoning requirements like setbacks, tower height limitations, etc. can be obtained.
- The soil resistivity at the site is sufficient to achieve REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET 0) ohms or less. Communications site grounding will be designed ar rola's Standards and Guidelines for Communications Sites (R56).
- Underground utilities are not present in the construction area, and as such no relocation will be required.
- AM tuning of towers has not been included in this proposal.
- A clear obstruction-free access exists from the antenna location to the equipment room.

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2.6 PDHQ Site

2.6.1 Development at PDHQ Site

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Included.
- Site acquisition services – Not included.
- Zoning Services – Not included.

Motorola Responsibilities:

Site Engineering

- Conduct site walks to collect pertinent information from the sites (e.g., location of Telco, power, existing facilities, etc.).
- Prepare record drawings of the site showing the as-built information.
- Perform National Environmental Policy Act (NEPA) Threshold Screening, including literature and records search and brief reporting, as necessary to identify ve natural and cultural features referenced in 47 Code of Federal Regulations Chapter 1, subsection 1.1307 that may be potentially impacted by the proposed construction activity. This does not include the additional field investigations to document site conditions if it is determined that the proposed communication facility "may have a significant environmental impact" and thus require additional documentation, submittals, or work. Perform a cultural resource study, as needed to identify sensitive historical and archaeological monuments that might be impacted by propose construction.
- Provide a structural engineering analysis for antenna support structure, if necessary, to support the proposed the proposed equipment loads.
- Design antenna support platform to support proposed dishes.
- Preparation, submission and tracking of application for local permit fees (electrical, building etc.) and procurement of information necessary for filing.

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Site Components Installation

- Supply and install 1 cable support system from the antenna to the entry port (up to 40 linear feet).

Antenna and Transmission Line Installation

- Supply and install 1 rooftop antenna mount(s) to support proposed antennas.

Customer Responsibilities:

- Provide personnel to observe construction progress and testing of site equipment according to the schedule provided by Motorola.
- As applicable (based on local jurisdictional authority), the Customer will be responsible for any installation or up-grades of the electrical system in order to comply with NFPA 70, Article 708

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- As required, provide property deed or lease agreement, and boundary survey, along with existing as-built drawings of the site and site components to Motorola for conducting site engineering.
- Provide a right of entry letter from the site owner for Motorola to conduct field investigations.
- Maintain existing access road in order to provide clear and stable entry to the site for heavy-duty construction vehicles, cement trucks and cranes. Sufficient space must be available at the site for these vehicles to maneuver under their own power, without assistance from other equipment.
- If required, provide any physical improvements (walls, roofing, flooring, painting, etc.) necessary to house the equipment in the existing room.
- Provide support and entry facilities for the cables (ca y, entry ports, etc.) between the proposed equipment locations.

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Assumptions:

- All work is assumed to be done during normal business hours as dictated by time zone (Monday thru Friday, 7:30 a.m. to 5:00 p.m.).
- Pricing has been based on National codes such IBC or BOCA. Local codes or jurisdictional requirements have not been considered in this proposal.
- Hazardous materials are not present at the work location. Testing and removal of hazardous materials, found during site investigations, construction or equipment installation will be the responsibility of the customer.
- A maximum of 30 days will be required for obtaining approved building permits from time of submission.
- No access road or staging area improvements are required for the heavy construction equipment which could include concrete trucks, drill rigs, semi tractors and trailers, and crane.
- If extremely harsh or difficult weather conditions delay the site work for more than a week, Motorola will seek excusable delays rather than risk job site safety.
- A clear obstruction-free access exists from the antenna location to the equipment room.

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MOTOROLA SOLUTIONS

City of Fort Lauderdale

Attachment 10 - Ongoing Maintenance and Support Program Description and Timeline

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.1.5.1 Ongoing Maintenance and Support Program Description and Timeline

Service and Support

Motorola Solutions has multiple offices in the area of Fort Lauderdale, along with a very strong FSO organization within the 2 hour response time of the City of Fort Lauderdale. Motorola has **at least 13 FSO badged** employees that live within the 2 hour response time of the City. This team will easily be able to provide all the maintenance and support required by the City of Fort Lauderdale for their new radio system. Motorola also has many more full time badged employees within the City of Fort Lauderdale itself who can easily provide support in the initial installation, configuration, warranty and ongoing maintenance needs. More information about the service and support is presented in the Ongoing Maintenance and Support Program Description and Timeline attachment.

Warranty and Maintenance Plan

Motorola Solutions' ASTRO® 25 and APX™ services provide a comprehensive sustainment program for fixed end network infrastructure equipment located at the network core, RF sites, and dispatch sites.

The proposed infrastructure services consist of the following elements:

- Network Event Monitoring
- Remote Technical Support
- Dispatch Service
- On-site Infrastructure Response – Premier – 2 Hour Response Time
- Infrastructure Repair
- Annual Preventive Maintenance.
- Third Party Maintenance (Eltek DC power, Logging Recorder, MW, MPLS)
- Security Update Services (SUS)
- Remote Security Update Services (RSUS)
- Managed Detection & Response (MDR) - Optional
- Custom System Upgrade Agreement

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1.1 Motorola Solutions Service Delivery Ecosystem

Advanced Services are delivered through a tailored combination of field service personnel, centralized teams, product repair depots and Customer Hub. These service resources will collaborate to swiftly analyze network issues, accurately diagnose root causes, and efficiently resolve issues to return the network to normal operation.

Motorola Solutions services will be delivered by staff experienced in servicing mission-critical networks. Motorola Solutions uses the Information Technology Infrastructure Library (ITIL) framework to define service tasks based on industry-recognized best practices. As staff perform tasks, service incident information will be available to the City of Fort Lauderdale's administrators and personnel through Customer Hub.

Service activities and Motorola Solutions' service team are described in more detail below.

1.1.1 Centralized Managed Support Operations

The cornerstone of Motorola Solutions' support process is the Centralized Managed Support Operations (CMSO) organization. This TL 9000/ISO 9001-certified organization is staffed 24x7x365 by experienced service desk specialists, security analysts, and operations managers. The CMSO houses critical central functions, including the Service Desk.

The CMSO Service Desk will serve as a single point of contact for services. It processes service requests, service incidents, change requests, and dispatching. The Service Desk communicates necessary information to stakeholders, bridging communications among the City of Fort Lauderdale, Motorola Solutions, and third-party subcontractors.

Service Desk teams record, track and update incidents through the Motorola Solutions Customer Relationship Management (CRM) system. They document and respond to inquiries, requests, concerns and service tickets. When an incident is initiated, the CMSO will engage with teams to resolve that incident. The CMSO will escalate to new teams when needed. Depending on the incident, the CMSO will coordinate incident resolution with local field service and authorized repair depots.

1.1.2 Field Service

Motorola Solutions authorized and qualified field service technicians will perform the On-site Infrastructure Response service, repair malfunctioning hardware in the field, and conduct preventive maintenance tasks. These technicians will coordinate with the Service Desk, technical support teams, and product engineering as needed to resolve incidents.

1.1.3 Repair Depot

The Motorola Solutions Repair Depot will provide the City of Fort Lauderdale with a central repair location. This will eliminate the need to send network equipment to multiple vendor locations for repair. Motorola Solutions tracks products sent to the Depot via a case management system throughout the repair process. This system will enable City of Fort Lauderdale's representatives to check repair status, from inbound shipment to return.

1.1.4 Customer Support Manager

A Motorola Solutions Customer Support Manager (CSM) will be City of Fort Lauderdale's key point of contact for the definition and administration of services. The CSM will work with City of Fort Lauderdale to define service delivery details to address City of Fort Lauderdale's specific priorities.

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1.1.5 Customer Hub

To provide City of Fort Lauderdale with quick access to service details, Motorola Solutions will provide our Customer Hub online network information tool. Customer Hub provides our customers with real-time critical network and services information through an easy-to-use graphical interface.



Figure: Customer Hub offers real-time, role-based access to critical network and services information.

With Customer Hub, City of Fort Lauderdale's administrators will be able to monitor system health and maintenance updates. Capabilities include:

- Viewing network and support compliance.
- Viewing incident reports.
- Updating and creating incidents.
- Checking system update status.
- Receiving pro-active notifications regarding updates.

Available 24x7x365 from any web-enabled device, the information provided by Customer Hub will be based on your needs and user access permissions, ensuring that the information displayed is secure and pertinent to your operations.

Infrastructure

Modern mission-critical communication networks support robust features, but their complexity usually requires specialized personnel to monitor and maintain. Motorola Solutions (Motorola) is proposing services for ASTRO® 25 infrastructure that provide the personnel and tools necessary to maintain network performance. With these services, the City of Fort Lauderdale will be able to rely on Motorola, instead of having to assemble and maintain a qualified support team.

Network Event Monitoring

Real-time, continuous ASTRO® 25 radio communications network monitoring and event management. Using sophisticated tools for remote monitoring and event characterization, Motorola will assess events, determine the appropriate response, and initiate that response. Possible responses include

remotely addressing the issue, escalation to product technical support groups, and dispatch of designated field technical resources.

Remote Technical Support

Motorola Solutions' Centralized Managed Support Operations (CMSO) will provide Remote Technical Support for infrastructure issues that require specific technical expertise. Experienced technical support specialists will be available to consult with the City of Fort Lauderdale to help diagnose, troubleshoot and resolve infrastructure issues. Service Desk maintenance procedures and incident resolution techniques are based on ISO 9001 and TL 9000 standards.

Dispatch Services

Following proven response and restore processes, Motorola Dispatch contacts the local authorized service center in your area and dispatches a qualified technician to your site. An automated escalation process ensures that technician site arrival and system restoration comply with contracted response times.

If the local technician is unable to resolve the problem, the escalation process includes intervention by Motorola System Support Center technologists or product engineering teams as needed (Remote Technical Support Service required).

On-site Infrastructure Response – Premier – 2 Hour Response Time

Motorola Solutions will provide repair service from trained and qualified technicians. Once dispatched, technicians will travel to City of Fort Lauderdale's ASTRO 25 network location to diagnose issues and restore functionality. These technicians will run diagnostics on hardware to identify defective components, and repair or replace them as appropriate. Infrastructure Response times are based on a given issue's impact on overall system function. Motorola has a very strong local presence within the City of Fort Lauderdale with almost 13 badged FSO employees living within the 2 hour response time.

Infrastructure Repair

To restore the City of Fort Lauderdale's ASTRO 25 network components if they malfunction, Motorola Solutions will repair Motorola Solutions-provided infrastructure equipment. This includes select third-party infrastructure equipment supplied by Motorola Solutions. Motorola Solutions will ship and return repaired equipment, and will coordinate the repair of third-party solution components. Motorola has included a very thorough list of spares to ensure all critical infrastructure is restored in a timely manner.

Annual Preventive Maintenance

Motorola Solutions will annually test and service network components. Qualified field technicians will perform routine hands-on examination and diagnostics of network equipment to keep them operating according to original manufacturer specifications.

Third Party Maintenance (Eventide, Eltek, MW, MPLS)

Motorola will do annual PM's on the Eltek DC batteries; provide remote support for MPLS along with return for exchange for any faulty equipment for the MPLS and MW equipment. Motorola has included Eventide SUA and on site support.

Security Update Service (SUS)

Commercial security software updates are often designed without consideration for specialized systems like radio communications networks. These updates may inadvertently disrupt ASTRO 25 network operations and functionality. To minimize cyber risks and software conflicts, Motorola Solutions provides the Security Update Service (SUS). With this service, Motorola Solutions deploys antivirus and

operating system security updates on an ASTRO 25 network in a dedicated information assurance lab to test and validate them for use with ASTRO 25 networks.

Remote Security Update Service (RSUS)

Commercial security software updates are often designed without consideration for specialized systems like radio communications networks. These updates may inadvertently disrupt ASTRO 25 network operations and functionality.

To minimize cyber risks and software conflicts, Motorola Solutions provides the Remote Security Update Service (RSUS). With this service, Motorola Solutions deploys antivirus and operating system security updates on an ASTRO 25 network in a dedicated information assurance lab to test and validate them for use with ASTRO 25 networks.

Motorola Solutions tests whether applying these security updates degrades network service. If an update degrades performance, Motorola Solutions searches for a solution or workaround to address the issue before releasing that update.

With RSUS, Motorola Solutions will remotely install tested updates on City of Fort Lauderdale's ASTRO 25 network. If there are any recommended configuration changes, warnings or workarounds, Motorola Solutions will provide detailed documentation on a secured extranet website.

System Upgrade Agreement

Motorola will deliver updates based on a predefined cadence of upgrade windows, with up to one update in each window. The System Upgrade Agreement service includes the following:

- Software Release Updates - Motorola-certified software that improves network functions over previous releases. This also includes commercial operating system and application software updates.
- Hardware Update – When needed to support a software release update, Motorola provides new hardware. New hardware will both support the new software update, as well as maintain existing functions and features.
- Professional Implementation Services – Motorola will plan and implement updates at the City of Fort Lauderdale's site. This includes factory integration, testing, and supply chain management for new software and hardware.
- With these services, the City will have access to the technology, support, and planning expertise needed for an effective upgrade.
- Motorola Solutions will provide an upgrade at the end of implementation and the final region's warranty period.

Subscriber Radio - Optional

Managing and maintaining today's user radio fleets is complicated and often requires a significant investment in building specialized teams to perform crucial tasks, such as user radio programming and repair. Motorola's radio services provide comprehensive APX user radio fleet support so that City of Fort Lauderdale can focus on mission-critical objectives.

Subscriber Technical Support – Only if Optional Radios are Purchased

Motorola Technical Support will provide a single point of contact for communications between City of Fort Lauderdale and Motorola. Technical Support personnel create, track, and update support cases,

following industry-leading standards to respond promptly and resolve cases quickly. Technical Support will direct City of Fort Lauderdale's service requests to the appropriate service team, assist with troubleshooting Radio Management and user radio issues, and escalate support to engineering teams when needed to resolve a case.

Subscriber Hardware Repair – Only if Optional Radios are Purchased

Hardware Repair provides repair services for APX user radios damaged by manufacturing defects and normal wear and tear. Repairs are provided by Motorola Solutions, or an authorized Motorola service repair center, for the length of the contract. The service center tests, repairs, and restores the user radio to original factory specifications. Repair may include updating the user radio's Operating System (OS) software to the latest version supported by the user radio.

The Hardware Repair service adheres to a proven process of analysis and restoration, and the work is backed by a 90-day warranty. User radios covered under this service also receive higher service priority at the repair depot, resulting in quicker repair times. In addition to repair service, Motorola Solutions will provide technical support for user radios.

The below table provides information on all the Warranty & Post Warranty services proposed by Motorola.

Service	Warranty	Post Warranty
Network Monitoring	✔ **Comply – Five Year Coverage**	✔
System Technical Support	✔ **Comply – Five Year Coverage**	✔
Dispatch Services	✔ **Comply – Five Year Coverage**	✔
On-site – Premier (2 Hour)	✔ **Comply – Five Year Coverage**	✔
Infrastructure Repair	✔ **Comply – Five Year Coverage**	✔
Preventive Maintenance	✔ **Comply – Five Year Coverage**	✔
System Update Service (SUS)	✔ **Comply – Five Year Coverage**	✔
Remote SUS	✔ **Comply – Five Year Coverage**	✔
Managed Detection and Response (MDR) / EDR	**OPTIONAL**	**OPTIONAL**
System Upgrade Agreement	✔ **Comply – Five Year Coverage**	✔

Section 2

Services Statements of Work

Network Event Monitoring Statement of Work

Overview

Network Event Monitoring provides continuous real-time fault monitoring for radio communications networks. Motorola Solutions uses a defined set of tools to remotely monitor the Customer's ASTRO® 25 radio network and characterize network events. When an actionable event takes place, it becomes an incident. Centralized Managed Support Operations (CMS) technologists acknowledge and assess these incidents, and initiate a defined response.

This Statement of Work (SOW), including all of its subsections and attachments, is an integral part of the applicable agreement (Agreement) between Motorola Solutions, Inc. (Motorola Solutions) and the customer (Customer).

In order to receive the services as defined within this SOW, the Customer is required to keep the system within a standard support period as described in Motorola Solutions' Software Support Policy (SwSP).

2.1 Description of Service

With Network Event Monitoring, Motorola Solutions uses a Managed Services Suite of Tools (MSST) to detect events 24/7 as they occur, analyze them, and escalate them to the Network Operation Center (NOC). Incidents will be generated automatically based on the criteria shown in Table 1.

Table: Alarm Threshold Rule Options for all Event Types

Standard Threshold	Optional Threshold
An incident will be triggered if an event fulfills one of the two following criteria: • Event occurs 5 times in 30 minutes. • Event causes 10 minutes of continuous downtime for a monitored component.	An incident will be triggered if an event fulfills one of the two following criteria: • Event occurs 7 times in 30 minutes. • Event causes 15 minutes of continuous downtime for a monitored component.

The CMSO NOC agent assigns a priority level to an incident and then initiates a response in accordance with the Customer Handling Procedure (CHP). Depending on the incident, Motorola Solutions' response may include continued monitoring for further incident development, remote remediation by technical support, dispatching a field service technician, or other actions Motorola Solutions determines necessary.

To prevent duplicate incidents from generating by the same root cause, Motorola Solutions employs an auto triage process that groups related incidents. The auto triage process therefore automatically

assigns grouped incidents to a field service technician, enabling the resolution of these incidents together if the root alarm has been addressed.

Motorola Solutions uses a set of standard templates to record key information on service process, defined actions, and points of contact for the Customer's service. In the event of an incident, Motorola Solutions and the Customer can reference these templates. When information is updated, it will be organized in four categories:

- **Open** – Motorola Solutions' points of contact for dispatch permissions, entitlement information, and knowledge management.
- **Vendor** – Escalation and contact information.
- **Resolution** – Incident closure information.
- **Site Arrival** – Site arrival and exit process information.

The Customer will be able to access information on Network Event Monitoring activities via Customer Hub, including incident management reports. Any specific remediation and action notes from Motorola Solutions' CMSO or field service technicians will be available for the Customer to review as well.

Service Configuration Portal-Lite (SCP-Lite), accessed through Customer Hub, provides a read-only view of the Customer's current service configuration, including site parameters, notification preferences, and dispatch information. If the Customer or Motorola Solutions make changes to the network, the updated information will be incorporated into SCP-Lite allowing the Customer a view of the ASTRO 25 radio network's state.

2.2 Scope

Network Event Monitoring is available 24 hours a day, 7 days a week. Incidents generated by the monitoring service will be handled in accordance with Priority Level Definitions and Response Times.

Network Event Monitoring is a globally provided service unless limited by data export control or other applicable local and regional regulations. Timeframes are based on the Customer's local time zone.

2.3 Inclusions

Network Event Monitoring is available for the devices listed in Monitored Elements.

Motorola Solutions Responsibilities

- Provide a dedicated network connection necessary for monitoring the Customer's communication network. Connectivity Matrix describes available connectivity options.
- If determined necessary by Motorola Solutions, provide Motorola Solutions-owned equipment at the Customer's premises for monitoring network elements. The type of equipment and location of deployment is listed in Motorola Solutions Owned and Supplied Equipment.
- Verify connectivity and event monitoring prior to system acceptance or start date.
- Monitor system continuously during hours designated in the Customer Support Plan (CSP), and in accordance with Priority Level Definitions and Response Times.
- Remotely access the Customer's system to perform remote diagnosis as permitted by the Customer pursuant to Customer Responsibilities.

- Create an incident, as necessary. Gather information to perform the following:
  - Characterize the issue
  - Determine a plan of action
  - Assign and track the incident to resolution
- Provide the Customer with system configuration info, site info, system notifications, and system notes via Customer Hub.
- Cooperate with the Customer to coordinate the transition of monitoring responsibilities between Motorola Solutions and the Customer as specified in Customer Responsibilities.
- Maintain communication as needed with the Customer in the field until incident resolution.
- Provide available information on incident resolution to the Customer.

Limitations and Exclusions

The following activities are outside the scope of the Network Monitoring service:

- Motorola Solutions will not monitor any elements outside of the Customer's ASTRO 25 network, or monitor infrastructure provided by [REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET] pecifically stated. Monitored elements must be within the ASTRO 25 radio n f sending alerts to the Unified Event Manager (UEM).
- Additional support charges above contracted service agreement fees may apply if Motorola Solutions determines that system faults were caused by the Customer making changes to critical system parameters without written agreement from Motorola Solutions.
- Monitoring of network transport, such as WAN ports, WAN cloud, and redundant paths, unless provided by supplemental service outside this standard scope.
- Elements deployed outside of ASTRO RNI (e.g., ASTRO CEN sites) are excluded from the service.
- Emergency on-site visits required to resolve technical issues that cannot be resolved by working remotely with the Customer's technical resource.
- System installations, upgrades, and expansions.
- Customer training.
- Hardware repair and/or replacement.
- Network security services.
- Information Assurance.

Customer Responsibilities

- Allow Motorola Solutions continuous remote access to enable the monitoring service.
- Provide continuous utility service to any Motorola Solutions equipment installed or used at the Customer's premises to support delivery of the service. The Customer agrees to take reasonable due care to secure the Motorola Solutions equipment from theft or damage while on the Customer's premises.
- Prior to contract start date, provide Motorola Solutions with pre-defined information necessary to complete a CSP, including:
  - Incident notification preferences and procedure.

  - Repair verification preference and procedure.
  - Database and escalation procedure forms.
- Submit timely changes in any information supplied to Motorola Solutions and included in the CSP to the Customer Support Manager (CSM).
- Notify the CMSO when the Customer performs any activity that impacts the system. Activity that impacts the system may include, but is not limited to: installing software or hardware upgrades, performing upgrades to the network, renaming elements or devices within the network, and taking down part of the system to perform maintenance.
- Send system configuration change requests to Motorola Solutions' CSM via Customer Hub.
- Allow Motorola Solutions' field service technician, if designated in the CSP, access to equipment, including any connectivity or monitoring equipment, if remote service is not possible.
- Allow Motorola Solutions' field service technician, if designated in the CSP, access to remove Motorola Solutions-owned monitoring equipment upon cancellation of service.
- Provide Motorola Solutions with all Customer-managed passwords required to access the Customer's system upon request, when opening a request for service support, or when needed to enable response to a technical issue.
- Pay additional support charges above the contracted service agreements that may apply if it is determined that system faults were caused by the Customer making changes to critical system parameters without written agreement from Motorola Solutions.
- In the event that Motorola Solutions agrees in writing to provide supplemental monitoring for third-party elements provided by the Customer, the Customer agrees to obtain third party consents or licenses required to enable Motorola Solutions to provide the monitoring service.
- Cooperate with Motorola Solutions and perform reasonable or necessary acts to enable Motorola Solutions to provide these services.
- Contact Motorola Solutions to coordinate transition of monitoring when the responsibility for monitoring needs to be transferred to or from Motorola Solutions, as specified in pre-defined information provided in the Customer's CSP. An example of a transfer scenario is transferring monitoring from Motorola Solutions for network monitoring after normal business hours.
  - Upon contact, the Customer must provide Motorola Solutions with customer name, site ID, status on any open incidents, priority level of any open incidents, brief descriptions of any ongoing incident, and action plan for resolving those incidents.
- Acknowledge that incidents will be handled in accordance with Priority Level Definitions and Response Times.

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2.4 Connectivity Matrix

The connectivity between the customer's system and Motorola CMSO to enable Network Event Monitoring should be established prior to the service start date

Table: Available Connectivity

System Type	Available Connectivity	Set up and Maintenance
ASTRO 25	ASTRO Connectivity Service as a link for Network Monitoring service only	Motorola

2.5 Motorola Solutions Owned and Supplied Equipment

This table identifies equipment that Motorola Solutions will supply to support the network monitoring service for the duration of the service.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Table: Motorola Solutions Owned and Supplied Equipment

Equipment Type	Location Installed
Firewall/Router	Master Site
Service Delivery Management Server	Master Site for each Zone

2.6 Monitored Elements

This table identifies the elements that can be monitored by the service. The specific quantities of each element to be monitored on the Customer's system will be inventoried in the CHP.

Table: Monitored Elements

Monitored Elements		
Active Directory	Enrichment Testing	Probe
Agent	Environmental	Core Switch
AIS	ESX	Radio Interface
AMB	Exit Router	RDM
Application Server	RNI Firewall	RFDS
APX Cloud Application	Core Server	RGU
ATR	Gateway	RNG
AUC	Gateway Router	Site Router
Backup Server	Gateway Unit	RTU
Base Radio	GIS Server	SCOM Server
Call Processor	HSS	Short Data Router

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Camera	Install Server	Statistical Server
CBSD	Site Switch	Storage Networking
CCGW	Licensing Service	Consoles
Load Balancer	Load Balancer	TRAK
Client Station	Logging Recorder	Terminal Server
CommandCentral AXS dispatch console	Logging Replay Station	Time Keeper
Controller	UNC	Training App
Conventional	UEM	Training Database
Core Router	MOSCAD Server	Trap Forwarder
Data Processing	Network Address	UCS
Database Server	Network Device	Licensing Server
Data Warehouse Server	NTP	Virtual Machine
Device Configuration Server	AIS	VMS
DNS	Application Server	VPM
Domain Controller	Packet Data Gateway	WSGU
D series Site Controller	Physical Host Environmental	ZDS
eNodeB	Physical Host Power and Network	Zone Controller
Active Directory	Power Distribution Unit	Syslog
Repeaters	Power Monitor	Proxy

2.7 Priority Level Definitions and Response Times

This section describes the criteria Motorola Solutions uses to prioritize incidents and service requests, and lists the response times for those priority levels.

Table: Priority Level Definitions and Response Times

Incident Priority	Incident Definition	Initial Response Time
Critical P1	Core: Core server or core link failure. No redundant server or link available. Sites/Subsites: Primary site down. Two RF sites or more than 10% of RF sites down, whichever is greater. Consoles: More than 40% of a site's console positions down. Conventional Channels: Conventional Channel Gateways (CCGW) down without redundant gateways available. Security Features: Security is non-functional or degraded.	Response provided 24/7 until service restoration. Technical resource will acknowledge incident and respond within 1 hour of CMSO logging incident.

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	Alarm Events: Door, motion, intrusion, power failure, or environmental alarms triggered.	
High P2	Core: Core server or link failures. Redundant server or link available. Consoles: Between 20% and 40% of a site's console positions down. Sites/Subsites: One RF site or up to 10% of RF sites down, whichever is greater. Conventional Channels: Up to 50% of CCGWs down. Redundant gateways available. Network Elements: Site router, site switch, or GPS server down. No redundant networking element available.	Response provided 24/7 until service restoration. Technical resource will acknowledge incident and respond within 4 hours of CMSO logging incident.
Medium P3	Consoles: Up to 20% of a site's console positions down. Conventional Channels: Single channel down. Redundant gateway available. Network Elements: Site router/switch or GPS server down. Redundant networking element available.	Response provided during normal business hours until service restoration. Technical resource will acknowledge incident and respond within 1 Business Day of CMSO logging incident.
Low P4	Service Requests: Minor events and warnings in the system. Preventative and planned maintenance activities (scheduled work).	Response provided during normal business hours. Motorola Solutions will acknowledge and respond within 1 Business Day.

Section 3

Remote Technical Support Statement of Work

Overview

Motorola Solutions' Remote Technical Support service provides telephone consultation for technical issues that require a high level of ASTRO® 25 network knowledge and troubleshooting capabilities. Remote Technical Support is delivered through the Motorola Solutions Centralized Managed Support Operations (CMSO) organization by a staff of technical support specialists skilled in diagnosis and swift resolution of infrastructure performance and operational issues.

Motorola Solutions applies leading industry standards in recording, monitoring, escalating, and reporting for technical support calls from its contracted customers to provide the support needed to maintain mission-critical systems.

This Statement of Work (SOW), including all of its subsections and attachments, is an integral part of the applicable agreement (Agreement) between Motorola Solutions, Inc. (Motorola Solutions) and the customer (Customer).

In order to receive the services as defined within this SOW, the Customer is required to keep the system within a standard support period as described in Motorola Solutions' Software Support Policy (SwSP).

3.1 Description of Service

The CMSO organization's primary goal is Customer Issue Resolution (CIR), providing incident restoration and service request fulfillment for Motorola Solutions' currently supported infrastructure. This team of highly skilled, knowledgeable, and experienced specialists is an integral part of the support and technical issue resolution process. The CMSO supports the Customer remotely using a variety of tools, including fault diagnostics tools, simulation networks, and fault database search engines.

Calls requiring incidents or service requests will be logged in Motorola Solutions' Customer Relationship Management (CRM) system, and Motorola Solutions will track the progress of each incident from initial capture to resolution. This helps ensure that technical issues are prioritized, updated, tracked, and escalated as necessary, until resolution. Motorola Solutions will advise and inform Customer of incident resolution progress and tasks that require further investigation and assistance from the Customer's technical resources.

The CMSO Operations Center classifies and responds to each technical support request in accordance with Priority Level Definitions and Response Times.

This service requires the Customer to provide a suitably trained technical resource that delivers maintenance and support to the Customer's system, and who is familiar with the operation of that

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system. Motorola Solutions provides technical consultants to support the local resource in the timely closure of infrastructure, performance, and operational issues.

3.2 Scope

The CMSO Service Desk is available via telephone 24 hours per day, 7 days per week, and 365 days per year to receive and log requests for technical support. Remote Technical Support service is provided in accordance with Priority Level Definitions and Response Times.

3.3 Inclusions

Remote Technical Support service will be delivered for Motorola Solutions-provided infrastructure, including integrated third-party products.

Motorola Solutions Responsibilities

- Maintain availability of the Motorola Solutions CMSO Service Desk via telephone (800-MSI-HELP) 24 hours per day, 7 days per week, and 365 days per year to receive, log, and classify Customer requests for support.
- Respond to incidents and technical service requests in accordance with Priority Level Definitions and Response Times.
- Provide caller a plan of action outlining additional requirements, activities, or information required to achieve restoral/fulfillment.
- Maintain communication with the Customer in the field as needed until resolution of the incident.
- Coordinate technical resolutions with agreed upon third-party vendors, as needed.
- Escalate support issues to additional Motorola Solutions technical resources, as applicable.
- Determine, in its sole discretion, when an incident requires more than the Remote Technical Support services described in this SOW and notify the Customer of an alternative course of action.

Limitations and Exclusions

The following activities are outside the scope of the Remote Technical Support service:

- Emergency on-site visits required to resolve technical issues that cannot be resolved by the CMSO working remotely with the Customer's technical resource.
- Customer training.
- System installations, upgrades, and expansions. REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET
- Hardware repair and/or exchange.
- Network security services.
- Remote Technical Support for network transport equipment or third-party products not sold by Motorola Solutions.
- Any maintenance and/or remediation required as a result of a virus or unwanted cyber intrusion.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Customer Responsibilities

- Prior to contract start date, provide Motorola Solutions with pre-defined information necessary to complete Customer Support Plan (CSP).
- Submit timely changes in any information supplied in the CSP to the Customer Support Manager (CSM).
- Contact the CMSO Service Desk to engage the Remote Technical Support service when needed, providing the necessary information for proper entitlement services. This information includes, but is not limited to, the name of contact, name of Customer, system ID number, site(s) in question, and a brief description of the problem that contains pertinent information for initial issue classification.
- Maintain suitably trained technical resources familiar with the operation of the Cust system to provide field maintenance and technical maintenance services for the sy REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET
- Supply suitably skilled and trained on-site presence when requested.
- Validate issue resolution in a timely manner prior to close of the incident.
- Acknowledge that incidents will be addressed in accordance with Priority Level Definitions and Response Times.
- Cooperate with Motorola Solutions, and perform all acts that are reasonable or necessary to enable Motorola Solutions to provide Remote Technical Support.
- In the event that Motorola Solutions agrees in writing to provide supplemental Remote Technical Support to third-party elements provided by the Customer, the Customer agrees to obtain all third-party consents or licenses required to enable Motorola Solutions to provide the service.

3.4 Priority Level Definitions and Response Times

This section describes the criteria Motorola Solutions uses to prioritize incidents and service requests, and lists the response times for those priority levels.

Table: Priority Level Definitions and Response Times

Incident Priority	Incident Definition	Initial Response Time
Critical P1	**Core:** Core server or core link failure. No redundant server or link available. **Sites/Subsites:** Primary site down. Two RF sites or more than 10% of RF sites down, whichever is greater. **Consoles:** More than 40% of a site's console positions down. **Conventional Channels:** Conventional Channel Gateways (CCGW) down without redundant gateways available. **Security Features:** Security is non-functional or degraded.	Response provided 24/7 until service restoration. Technical resource will acknowledge incident and respond within 1 hour of CMSO logging incident.
High P2	**Core:** Core server or link failures. Redundant server or link available.	Response provided 24/7 until service restoration.

	Consoles: Between 20% and 40% of a site's console positions down. **Sites/Subsites:** One RF site or up to 10% of RF sites down, whichever is greater. **Conventional Channels:** Up to 50% of CCGWs down. Redundant gateways available. **Network Elements:** Site router, site switch, or GPS server down. No redundant networking element available.	Technical resource will acknowledge incident and respond within 4 hours of CMSO logging incident.
Medium P3	**Consoles:** Up to 20% of a site's console positions down. **Conventional Channels:** Single channel down. Redundant gateway available. **Network Elements:** Site router/switch or GPS server down. Redundant networking element available.	Response provided during normal business hours until service restoration. Technical resource will acknowledge incident and respond within 1 Business Day of CMSO logging incident.
Low P4	**Service Requests:** Minor events and warnings in the system. Preventative and planned maintenance activities (scheduled work).	Response provided during normal business hours. Motorola Solutions will acknowledge and respond within 1 Business Day.

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Section 4

Dispatch Services Statement of Work

Overview

Motorola Solutions' Centralized Managed Support Operations (CMSO) organization will serve as a central point of contact for the Customer's on-site technical service requests. The CMSO will dispatch the appropriate service response and resources to Customer, and coordinate them. Motorola Solutions will track and monitor service requests from incident creation to close through an electronic incident process.

This Statement of Work (SOW), including all of its subsections and attachments is an integral part of the applicable agreement (Agreement) between Motorola Solutions, Inc. (Motorola Solutions) and the customer (Customer).

In order to receive the services as defined within this SOW, the Customer is required to keep the system within a standard support period as described in Motorola Solutions' Software Support Policy (SwSP).

4.1 Description of Service

The Motorola Solutions CMSO Service Desk will receive the Customer's request for on-site service. The CMSO Dispatch Operations team is responsible for opening incidents, dispatching on-site resources, monitoring issue resolution, and escalating as needed. Motorola Solutions will manage incidents as described in this SOW. The CMSO Service Desk will maintain contact with the Customer's field service technician until incident closure.

4.2 Scope

Customer Technician Dispatch provides dispatch services in accordance with agreed response times. Customer's Response Time Classification is designated in the Customer Support Plan (CSP).

4.3 Inclusions

Customer Technician Dispatch is provided for Motorola Solutions-sold infrastructure.

Motorola Solutions Responsibilities

- Receive service requests.
- Create an incident when service requests are received. Gather information to characterize the issue, determine a plan of action, assign to the Customer's field service technician, and track the incident to resolution.
- Contact the Customer's designated dispatch contact (Customer Contact) and provide necessary incident information collected by Motorola Solutions.
    - If the Customer Contact does not respond to Motorola Solutions as described within Section 1.6: Customer Responsibilities, Motorola Solutions will continue to attempt to

reach the Customer Contact every 10 minutes until Motorola Solutions has attempted to communicate with each contact name set forth in the pre-defined escalation contact table provided by the Customer.

- After attempting to reach every Customer Contact named on the pre-defined escalation contact table, Motorola Solutions will either send an email or leave a voice mail message with the Customer Contact to notify the Customer Contact of the incident. Thereafter, Motorola Solutions will defer the incident to the next (second) Standard Business Day.
- On the next (second) Standard Business Day, Motorola Solutions will try to reach the Customer Contact again. If Motorola Solutions has attempted to communicate with all Customer Contacts named on the Customer escalation table, and has not received a response from any Customer Contact, Motorola Solutions will close the incident. MOTOROLA SOLUTIONS WILL NOT BE RESPONSIBLE FOR ANY DAMAGES OF ANY KIND ARISING OUT OF OR RELATING TO THE INABILITY OF MOTOROLA SOLUTIONS TO REACH THE CUSTOMER CONTACT OR PERSONS ON THE CUSTOMER ESCALATION TABLE WITHIN TWO STANDARD BUSINESS DAYS.

- If the Customer's field service technician does not report site arrival within response times, escalate the incident as indicated by the escalation contact table provided by the Customer.
- If required by Customer’s repair verification preferences, verify with the Customer that restoration is complete or system is functional. Close incident once the Customer notifies Motorola Solutions of incident resolution.
  - If the Customer cannot confirm within 20 minutes of restoration, Motorola Solutions will close the incident and will release the Customer field service technician.
- Notify the Customer of incident status, as defined in the CSP and Service Configuration Portal (SCP):
  - Open and closed.
  - Open, assigned to the Customer’s field service technician, arrival of the field service technician on-site, delayed, or closed.
- Provide incident activity reports to the Customer, if requested.

Customer Responsibilities

- Contact Motorola Solutions, as necessary, to request service.
- Prior to start date, provide Motorola Solutions with the following pre-defined Customer information and preferences necessary to complete CSP:
  - Incident notification preferences and procedure.
  - Escalation contact table.
  - Site arrival preference.
  - Repair verification preference and procedure.
- Provide the following information when initiating a service request with the CMSO:
  - Assigned system ID number.
  - Problem description and site location.
  - Other pertinent information requested by Motorola Solutions to open an incident.
- Respond to Motorola Solutions within 10 minutes of receipt of page or telephone call to accept incident assignment.

- If the Customer fails to contact Motorola Solutions within 10 minutes, Motorola Solutions will escalate contact as described under Section 1.5: Motorola Solutions Responsibilities.

- If dictated by the Customer's site arrival preferences, have Customer's field service technician report site arrival to Motorola Solutions for all accepted incident assignments.
- Have the Customer's field service technician report incident resolution to Motorola Solutions.
- Cooperate with Motorola Solutions and perform acts that are reasonable or necessary to enable Motorola Solution to provide the Customer Technician Dispatch service to the Customer.

4.4 Recommended Priority Level Response Times

This section describes the criteria Motorola Solutions uses to prioritize incidents and service requests, and lists the response times for those priority levels. Motorola Solutions standard response times for on-site services are included in the following tables for reference.

Table: Standard Priority Level Definitions and Response Times

Incident Priority	Incident Definition	On-site Response Time
Critical P1	**Core:** Core server or core link failure. No redundant server or link available. **Sites/Subsites:** Primary site down. Two RF sites or more than 10% of RF sites down, whichever is greater. **Consoles:** More than 40% of a site's console positions down. **Conventional Channels:** Conventional Channel Gateways (CCGW) down without redundant gateways available. **Security Features:** Security is non-functional or degraded.	Response provided 24/7 until service restoration. Field service technician arrival on-site within 4 hours of receiving dispatch notification.
High P2	**Core:** Core server or link failures. Redundant server or link available. **Consoles:** Between 20% and 40% of a site's console positions down. **Sites/Subsites:** One RF site or up to 10% of RF sites down, whichever is greater. **Conventional Channels:** Up to 50% of CCGWs down. Redundant gateways available. **Network Elements:** Site router, site switch, or GPS server down. No redundant networking element available.	Response provided 24/7 until service restoration. Field service technician arrival on-site within 4 hours of receiving dispatch notification.
Medium P3	**Consoles:** Up to 20% of a site's console positions down. **Conventional Channels:** Single channel down. Redundant gateway available. **Network Elements:** Site router/switch or GPS server down. Redundant networking element available.	Response provided during normal business hours until service restoration. Field service technician arrival on-site within 8 hours of receiving dispatch notification.

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Low P4	**Service Requests:** Minor events and warnings in the system. Preventative and planned maintenance activities (scheduled work).	Not applicable.

Table: Premier Priority Level Definitions and Response Times

Incident Priority	Incident Definition	On-site Response Time
Critical P1	**Core:** Core server or core link failure. No redundant server or link available. **Sites/Subsites:** Primary site down. Two RF sites or more than 10% of RF sites down, whichever is greater. **Consoles:** More than 40% of a site's console positions down. **Conventional Channels:** Conventional Channel Gateways (CCGW) down without redundant gateways available. **Security Features:** Security is non-functional or degraded.	Response provided 24/7 until service restoration. Field service technician arrival on-site within 2 hours of receiving dispatch notification.
High P2	**Core:** Core server or link failures. Redundant server or link available. **Consoles:** Between 20% and 40% of a site's console positions down. **Sites/Subsites:** One RF site or up to 10% of RF sites down, whichever is greater. **Conventional Channels:** Up to 50% of CCGWs down. Redundant gateways available. **Network Elements:** Site router, site switch, or GPS server down. No redundant networking element available.	Response provided 24/7 until service restoration. Field service technician arrival on-site within 2 hours of receiving dispatch notification.
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Low P4	**Service Requests:** Minor events and warnings in the system. Preventative and planned maintenance activities (scheduled work).	Not applicable.

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Medium P3	**Consoles:** Up to 20% of a site's console positions down. **Conventional Channels:** Single channel down. Redundant gateway available. **Network Elements:** Site router/switch or GPS server down. Redundant networking element available.	Response provided during normal business hours until service restoration. Field service technician arrival on-site within 8 hours of receiving dispatch notification.
Low P4	**Service Requests:** Minor events and warnings in the system. Preventative and planned maintenance activities (scheduled work).	Not applicable.

Section 5

On-Site Infrastructure Response Statement of Work

Overview

Motorola Solutions' On-site Infrastructure Response service provides incident management and escalation for on-site technical service requests. The service is delivered by Motorola Solutions' Centralized Managed Support Operations (CMSO) organization in cooperation with a local service provider.

This Statement of Work (SOW), including all of its subsections and attachments, is an integral part of the applicable agreement (Agreement) between Motorola Solutions, Inc. (Motorola Solutions) and the customer (Customer).
In order to receive the services as defined within this SOW, the Customer is required to keep the system within a standard support period as described in Motorola Solutions' Software Support Policy (SwSP).
On-site Infrastructure Response may also be referred to as On-site Support.

5.1 Description of Service

The Motorola Solutions CMSO Service Desk will receive the Customer's request for on-site service.

The CMSO Dispatch Operations team is responsible for opening incidents, dispatching on-site resources, monitoring issue resolution, and escalating as needed to ensure strict compliance to committed response times.

The dispatched field service technician will travel to the Customer's location to restore the system in accordance with Priority Level Definitions and Response Times.

Motorola Solutions will manage incidents as described in this SOW. The CMSO Service Desk will maintain contact with the field service technician until incident closure.

5.2 Scope

On-site Infrastructure Response is available in accordance with Priority Level Definitions and Response Times. Customer's Response Time Classification is designated in the Customer Support Plan.

5.3 Geographic Availability

On-site Infrastructure Response is available worldwide where Motorola Solutions servicers are present. Response times are based on the Customer's local time zone and site location. City of Fort Lauderdale will receive a 2 Hour On Site Response time as requested in the RFP.

5.4 Inclusions

On-site Infrastructure Response is provided for Motorola Solutions-provided infrastructure.

Limitations and Exclusions

The following items are excluded from this service:

- The contract pricing provided does not take into account prevailing wage requirements. Should prevailing wage regulations be applicable to this project, the pricing shall be subject to change to reflect compliance with those regulations.
- All Motorola Solutions infrastructure components beyond the post-cancellation support period.
- All third-party infrastructure components beyond the post-cancellation support period.
- All broadband infrastructure components beyond the post-cancellation support period.
- Physically damaged infrastructure components.
- Third-party equipment not shipped by Motorola Solutions.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

- Consumable items including, but not limited to, batteries, connectors, cables, toner or ink cartridges, tower lighting, laptop computers, monitors, keyboards, and mouse.
- Video retrieval from digital in-car video equipment.
- RF infrastructure and backhaul components, including but not limited to, antennas, transmission lines, antenna dehydrators, microwave, line boosters, amplifiers (such as tower top amplifiers and bi-directional amplifiers), logging recorders, data talker wireless transmitters, short haul modems, combiners, multicouplers, duplexers, shelters, shelter HVAC, generators, UPSs, and test equipment.
- Racks, furniture, and cabinets.
- Tower and tower mounted equipment.
- Non-standard configurations, customer-modified infrastructure, and certain third party infrastructure.
- Firmware or software upgrades.

Motorola Solutions Responsibilities

- Receive service requests.
- Create an incident when service requests are received. Gather information to characterize the issue, determine a plan of action, and assign and track the incident to resolution.
- Dispatch a field service technician, as required by Motorola Solutions' standard procedures, and provide necessary incident information.
- Provide the required personnel access to relevant Customer information, as needed.
- Motorola Solutions field service technician will perform the following on-site:
    - Run diagnostics on the infrastructure component.
    - Replace defective infrastructure components, as supplied by the Customer.
    - Provide materials, tools, documentation, physical planning manuals, diagnostic and test equipment, and any other material required to perform the maintenance service.

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  - If a third-party vendor is needed to restore the system, the vendor can be accompanied onto the Customer's premises.
  - If required by the Customer's repair verification in the Customer Support Plan (CSP), verify with the Customer that restoration is complete or system is functional. If verification by the Customer cannot be completed within 20 minutes of restoration, the incident will be closed and the field service technician will be released.
  - Escalate the incident to the appropriate party upon expiration of a response time.
- Close the incident upon receiving notification from the Customer or Motorola Solutions field service technician, indicating the incident is resolved.
- Notify the Customer of incident status, as defined in the CSP and Service Configuration Portal (SCP):
  - Open and closed.
  - Open, assigned to the Motorola Solutions field service technician, arrival of the field service technician on-site, delayed, or closed.
- Provide incident activity reports to the Customer, if requested

Customer Responsibilities

- Contact Motorola Solutions, as necessary, to request service.
- Prior to start date, provide Motorola Solutions with the following pre-defined Customer information and preferences necessary to complete CSP:
  - Incident notification preferences and procedure.
  - Repair verification preference and procedure.
  - Database and escalation procedure forms.
- Submit timely changes in any information supplied in the CSP to the Customer Support Manager (CSM).
- Provide the following information when initiating a service request:
  - Assigned system ID number.
  - Problem description and site location.
  - Other pertinent information requested by Motorola Solutions to open an incident.
- Provide field service technician with access to equipment.
- Supply infrastructure spare or FRU, as applicable, in order for Motorola Solutions to restore the system.
- Maintain and store software needed to restore the system in an easily accessible location.
- Maintain and store proper system backups in an easily accessible location.
- If required by repair verification preference provided by the Customer, verify with the CMSO Service Desk and dispatch that restoration is complete or system is functional.
- Cooperate with Motorola Solutions and perform reasonable or necessary acts to enable Motorola Solutions to provide these services.
- In the event that Motorola Solutions agrees in writing to provide supplemental On-site Infrastructure Response to Customer-provided third-party elements, the Customer agrees to

obtain and provide applicable third-party consents or licenses to enable Motorola Solutions to provide the service.

5.5 Priority Level Definitions and Response Times

This section describes the criteria Motorola Solutions uses to prioritize incidents and service requests, and lists the response times for those priority levels.

Table: Standard Priority Level Definitions and Response Times

Incident Priority	Incident Definition	On-site Response Time
Critical P1	**Core**: Core server or core link failure. No redundant server or link available. **Sites/Subsites**: Primary site down. Two RF sites or more than 10% of RF sites down, whichever is greater. **Consoles**: More than 40% of a site's console positions down. **Conventional Channels**: Conventional Channel Gateways (CCGW) down without redundant gateways available. **Security Features**: Security is non-functional or degraded.	Response provided 24/7 until service restoration. Field service technician arrival on-site within 4 hours of receiving dispatch notification.
High P2	**Core**: Core server or link failures. Redundant server or link available. **Consoles**: Between 20% and 40% of a site's console positions down. **Sites/Subsites**: One RF site or up to 10% of RF sites down, whichever is greater. **Conventional Channels**: Up to 50% of CCGWs down. Redundant gateways available. **Network Elements**: Site router, site switch, or GPS server down. No redundant networking element available.	Response provided 24/7 until service restoration. Field service technician arrival on-site within 4 hours of receiving dispatch notification.
Medium P3	**Consoles:** Up to 20% of a site's console positions down. **Conventional Channels**: Single channel down. Redundant gateway available. **Network Elements**: Site router/switch or GPS server down. Redundant networking element available.	Response provided during normal business hours until service restoration. Field service technician arrival on-site within 8 hours of receiving dispatch notification.
Low P4	**Service Requests**: Minor events and warnings in the system. Preventative and planned maintenance activities (scheduled work).	Not applicable.

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Table: Premier Priority Level Definitions and Response Times

Incident Priority	Incident Definition	On-site Response Time
Critical P1	**Core**: Core server or core link failure. No redundant server or link available. **Sites/Subsites**: Primary site down. Two RF sites or more than 10% of RF sites down, whichever is greater. **Consoles**: More than 40% of a site's console positions down. **Conventional Channels**: Conventional Channel Gateways (CCGW) down without redundant gateways available. **Security Features**: Security is non-functional or degraded.	Response provided 24/7 until service restoration. Field service technician arrival on-site within 2 hours of receiving dispatch notification.
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	Security Features: Security is non-functional or degraded.	
High P2	**Core**: Core server or link failures. Redundant server or link available. **Consoles**: Between 20% and 40% of a site's console positions down. **Sites/Subsites**: One RF site or up to 10% of RF sites down, whichever is greater. **Conventional Channels**: Up to 50% of CCGWs down. Redundant gateways available. **Network Elements**: Site router, site switch, or GPS server down. No redundant networking element available.	Response provided during normal business hours until service restoration. Field service technician arrival on-site within 4 hours of receiving dispatch notification.
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Low P4	**Service Requests**: Minor events and warnings in the system. Preventative and planned maintenance activities (scheduled work).	Not applicable.

Section 6

Infrastructure Repair Statement of Work

Overview

Motorola Solutions will provide hardware repair for Motorola Solutions and select third-party infrastructure equipment supplied by Motorola Solutions. A Motorola Solutions authorized repair depot manages and performs the repair of Motorola Solutions supplied equipment, and coordinates equipment repair logistics.

This Statement of Work (SOW), including all of its subsections and attachments, is an integral part of the applicable agreement (Agreement) between Motorola Solutions, Inc. (Motorola Solutions) and the customer (Customer).

In order to receive the services as defined within this SOW, the Customer is required to keep the system within a standard support period as described in Motorola Solutions' Software Support Policy (SwSP).

6.1 Description of Service

Infrastructure components are repaired at Motorola Solutions-authorized Infrastructure Depot Operations (IDO). At Motorola Solutions' discretion, select third-party infrastructure may be sent to the original equipment manufacturer or third-party vendor for repair.

Infrastructure Repair is also known as Network Hardware Repair.

6.2 Scope

Repair authorizations are obtained by contacting the Centralized Managed Support Operations (CMSO) organization Service Desk, which is available 24 hours a day, 7 days a week. Repair authorizations can also be obtained by contacting the Customer Support Manager (CSM).

6.3 Geographic Availability

Infrastructure Repair is supported globally. Geographic proximity will determine repair location.

6.4 Inclusions

This service is available on Motorola Solutions-provided infrastructure components, including integrated third-party products. Motorola Solutions will make a commercially reasonable effort to repair Motorola Solutions manufactured infrastructure products after product cancellation. The post-cancellation support period of the product will be noted in the product's end-of-life (EOL) notification.

Motorola Solutions Responsibilities

- Provide the Customer access to the CMSO Service Desk, operational 24 hours a day and 7 days per week, to request repair service.
- Provide repair return authorization numbers when requested by the Customer.
- Receive malfunctioning infrastructure components from the Customer and document its arrival, repair and return.
- Conduct the following services for Motorola Solutions infrastructure:
    - Perform an operational check on infrastructure components to determine the nature of the problem.
    - Replace malfunctioning components.
    - Verify that Motorola Solutions infrastructure components are returned to applicable Motorola Solutions factory specifications.
    - Perform a box unit test on serviced infrastructure components.
    - Perform a system test on select infrastructure components.
- Conduct the following services for select third-party infrastructure:
    - When applicable, perform pre-diagnostic and repair services to confirm infrastructure component malfunctions and prevent sending infrastructure components with No Trouble Found (NTF) to third-party vendor for repair.
    - When applicable, ship malfunctioning infrastructure components to the original equipment manufacturer or third-party vendor for repair service.
    - Track infrastructure components sent to the original equipment manufacturer or third-party vendor for service.
    - When applicable, perform a post-test after repair by original equipment manufacturer or third-party vendor to confirm malfunctioning infrastructure components have been repaired and function properly in a Motorola Solutions system configuration.
- Reprogram repaired infrastructure components to original operating parameters based on software and firmware provided by the Customer, as required in Section Customer Responsibilities. If the Customer's software version and configuration are not provided, shipping will be delayed. If the repair depot determines that infrastructure components are malfunctioning due to a software defect, the repair depot reserves the right to reload these components with a different but equivalent software version.
- Properly package repaired infrastructure components.
- Ship repaired infrastructure components to Customer-specified address during normal operating hours of Monday through Friday from 7:00 a.m. to 7:00 p.m. Central Standard Time (CST), excluding holidays. Infrastructure component will be sent using two-day air shipping unless the Customer requests otherwise. Motorola Solutions will pay for shipping unless the Customer requests shipments outside of the above mentioned standard business hours or carrier programs, such as next flight out (NFO). In such cases, the Customer will be responsible for paying shipping and handling charges.

Limitations and Exclusions

Motorola Solutions may return infrastructure equipment that is no longer supported by Motorola Solutions, the original equipment manufacturer, or a third-party vendor without repairing or replacing it. The following items are excluded from this service:

- All Motorola Solutions infrastructure components over the post-cancellation support period.
- All third-party infrastructure components over the post-cancellation support period.
- All broadband infrastructure components over the post-cancellation support period.
- Physically damaged infrastructure components.
- Third-party equipment not shipped by Motorola Solutions.
- Consumable items including, but not limited to, batteries, connectors, cables, toner or ink cartridges, tower lighting, laptop computers, monitors, keyboards, and mouse.
- Video retrieval from digital in-car video equipment.
- RF infrastructure and backhaul components, including but not limited to, antennas, transmission lines, antenna dehydrators, microwave, line boosters, amplifiers (such as tower top amplifiers and bi-directional amplifiers), logging recorders, data talker wireless transmitters, short haul modems, combiners, multicouplers, duplexers, shelters, shelter HVAC, generators, UPSs, dropship non standard items and test equipment.
- Racks, furniture, and cabinets.
- Non-standard configurations, customer-modified infrastructure, and certain third party infrastructure.
- Firmware or software upgrades.

Customer Responsibilities

- Contact or instruct servicer to contact the Motorola Solutions CMSO organization, and request a return authorization number prior to shipping malfunctioning infrastructure components.
- Provide model description, model number, serial number, type of system, software and firmware version, symptom of problem, and address of site location for spare infrastructure components.
- Indicate if Motorola Solutions or third-party infrastructure components being sent in for service were subjected to physical damage or lightning damage.
- Follow Motorola Solutions instructions regarding including or removing firmware and software applications on infrastructure components being sent in for service.
- In the event that the Customer requires repair of equipment that is not contracted under this service at the time of request, the Customer acknowledges that charges may apply to cover shipping, labor, and parts. Motorola Solutions and the Customer will collaborate to agree on payment vehicle that most efficiently facilitates the work, commensurate with the level of urgency that is needed to complete the repair.
- Properly package and ship the malfunctioning component, at the Customer's expense. The Customer is responsible for properly packaging the malfunctioning infrastructure component to ensure it is not damaged in-transit and arrives in repairable condition.
    - Clearly print the return authorization number on the outside of the packaging.
- Maintain versions and configurations for software, applications, and firmware to be installed on repaired equipment.

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- Provide Motorola Solutions with proper software and firmware information to reprogram equipment after repair, unless current software has caused this malfunction.
- Cooperate with Motorola Solutions and perform reasonable or necessary acts to enable Motorola Solutions to provide hardware repair services to the Customer.
- At the Customer's cost, obtain all third-party consents or licenses required to enable Motorola Solutions to provide the service.

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6.5 Repair Process

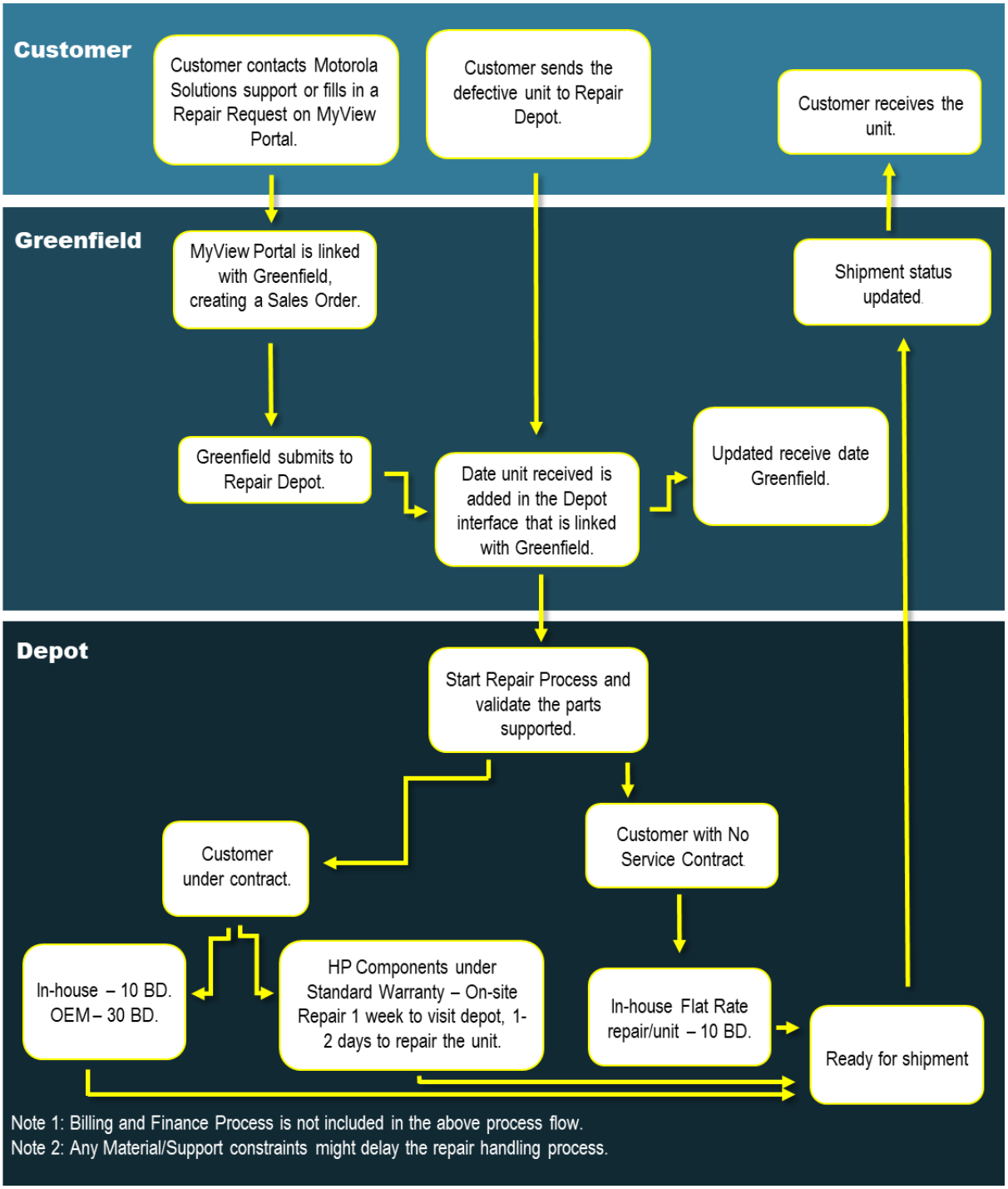


Figure: Repair Decision Process

Section 7

Annual Preventive Maintenance Statement of Work

Overview

Motorola Solutions personnel will perform a series of maintenance tasks to keep network equipment functioning correctly.

This Statement of Work (SOW), including all of its subsections and attachments is an integral part of the applicable agreement ("Agreement") between Motorola Solutions, Inc. ("Motorola Solutions") and the customer ("Customer").
In order to receive the services as defined within this SOW, the Customer is required to keep the system within a standard support period as described in Motorola Solutions' Software Support Policy (SwSP).

7.1 Description of Service

Annual Preventative Maintenance provides annual operational tests on the Customer's infrastructure equipment to monitor its conformance to specifications.

7.2 Scope

Annual Preventive Maintenance will be performed during standard business hours, unless otherwise agreed to in writing. After the service starts, if the system or Customer requirements dictate that the service must occur outside of standard business hours, an additional quotation will be provided. The Customer is responsible for any charges associated with unusual access requirements or expenses.

7.3 Inclusions

Annual Preventive Maintenance service will be delivered for Motorola Solutions-provided infrastructure, including integrated third-party products, per the level of service marked in the below table.

Preventive Maintenance Level

Service Level	Included
Level 1 Preventive Maintenance	X
Level 2 Preventive Maintenance	

Motorola Solutions Responsibilities

- Notify the Customer of any planned system downtime needed to perform this service.
- Maintain communication with the Customer as needed until completion of the Annual Preventive Maintenance.
- Determine, in its sole discretion, when an incident requires more than the Annual Preventive Maintenance services described in this SOW, and notify the Customer of an alternative course of action.
- Provide the Customer with a report in MyView Portal, or as otherwise agreed in the Customer Support Plan (CSP), comparing system performance with expected parameters, along with any recommended actions. Time allotment for report completion is to be mutually agreed.
- Provide trained and qualified personnel with proper security clearance required to complete Annual Preventive Maintenance services.
- Field service technician will perform the following on-site:
    - Perform the tasks defined in the section **Preventive Maintenance Tasks.**
    - Perform the procedures defined in the section **Site Performance Evaluation Procedures** for each site type on the system.
    - Provide diagnostic and test equipment necessary to perform the Preventive Maintenance service.
    - As applicable, use the Method of Procedure (MOP) defined for each task.

Limitations and Exclusions

The following activities are outside the scope of the Annual Preventive Maintenance service.

- Preventive maintenance for third-party equipment not sold by Motorola Solutions as part of the original system.
- Network transport link performance verification.
- Verification or assessment of Information Assurance.
- Any maintenance and/or remediation required as a result of a virus or unwanted cyber intrusion.
- Tower climbs, tower mapping analysis, or tower structure analysis.

The contract pricing provided does not take into account prevailing wage requirements. Should prevailing wage regulations be applicable to this project, the pricing shall be subject to change to reflect compliance with those regulations.

Customer Responsibilities

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

- Provide preferred schedule for Annual Preventative Maintenance to Motorola Solutions.
- Authorize and acknowledge any scheduled system downtime.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

- Maintain periodic backup of databases, software applications, and firmware.
- Establish and maintain a suitable environment (heat, light, and power) for the equipment location as described in equipment specifications, and provide Motorola Solutions full, free, and safe access to the equipment so that Motorola Solutions may provide services. All sites shall be accessible by standard service vehicles.

- Submit timely changes in any information supplied in the CSP to the Customer Support Manager (CSM).
- Provide site escorts, if required, in a timely manner.
- Provide Motorola Solutions with requirements necessary for access to secure facilities.
- In the event that Motorola Solutions agrees in writing to provide supplemental Annual Preventive Maintenance to third-party elements provided by Customer, the Customer agrees to obtain any third-party consents or licenses required to enable Motorola Solutions field service technician to access the sites to provide the service.

7.4 Preventive Maintenance Tasks

The Preventive Maintenance service includes the tasks listed in this section. Tasks will be performed based on the level of service noted in the section **Inclusions**.

PRINCIPAL SITE CHECKLIST – LEVEL 1	
Servers	
Equipment Alarms	Check LED and/or other status indicators for fault conditions.
Capture Diagnostics	Perform recommended diagnostic tests based on server type. Capture available diagnostic logs.
Network Management (“NM”) Client Applications	Review Unified Event Manager (“UEM”) events and verify backhaul links are reported as operational. Review event log for persistent types. Verify all NM client applications are operating correctly.
Verify System software physical media	Perform audit of software media on site. Verify that versions, KC numbers, and types match what is deployed to Customer server.
Complete Backup	Verify backups have been completed or scheduled, and that data has been stored in accordance with the Customer’s backup plan. Check that adequate storage space is available for backups.
Network Time Protocol (“NTP”)	Verify operation and syncing all devices.
Data Collection Devices (“DCD”) check (if present)	Verify data collection.
Anti-Virus	Verify anti-virus is enabled and that definition files on core security management server were updated within two weeks of current date.
Routers	
Equipment Alarms	Check LED and/or other status indicators for fault conditions.
Capture Diagnostics	Perform recommended diagnostic tests based on router type. Capture available diagnostic logs.
Verify Redundant Routers	Test redundancy in cooperative WAN routers. Carry out core router switchover in coordination with Customer.
Switches	
Equipment Alarms	Check LED and/or other status indicators for fault conditions.
Capture Diagnostics	Perform recommended diagnostic tests based on switch type. Capture available diagnostic logs.

Verify Redundant Switches	Test redundancy in backhaul switches. Carry out core router switchover in coordination with Customer.
Domain Controllers (non-Common Server Architecture)	
Equipment Alarms	Check LED and/or other status indicators for fault conditions.
Capture Diagnostics	Perform recommended diagnostic tests based on server type. Capture available diagnostic logs.
Verify System software physical media	Perform audit of software media on site. Verify that versions, KC numbers, and types match what is deployed to Customer server.
Firewalls	
Equipment Alarms	Check LED and/or other status indicators for fault conditions.
Capture Diagnostics	Perform recommended diagnostic tests based on server type. Capture available diagnostic logs.
Logging Equipment	
Equipment Alarms	Check LED and/or other status indicators for fault conditions.
Capture Diagnostics	Perform recommended diagnostic tests based on server type. Capture available diagnostic logs.
Server CPU Health	Check memory, HDD, CPU, and disk space utilization.

PRIME SITE CHECKLIST – LEVEL 1	
Software	
Verify System software physical media	Perform audit of software media on site. Verify that versions, KC numbers, and types match what is deployed to Customer server.
Switches	
Equipment Alarms	Check LED and/or other status indicators for fault conditions.
Capture Diagnostics	Perform recommended diagnostic tests based on switch type. Capture available diagnostic logs.
Clean Fans and Equipment	Use antistatic vacuum to clean cooling pathways.
Routers	
Equipment Alarms	Check LED and/or other status indicators for fault conditions.
Capture Diagnostics	Perform recommended diagnostic tests based on router type. Capture available diagnostic logs.
Clean Fans and Equipment	Use antistatic vacuum to clean cooling pathways.
Miscellaneous Equipment	
Equipment Alarms	Check LED and/or other status indicators for fault conditions.
Capture Diagnostics	Perform recommended diagnostic tests based on server type. Capture available diagnostic logs.
Site Frequency Standard Check (Timing Reference Unit)	Check LEDs for proper operation.
Site Controllers	

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Capture Diagnostics	Perform recommended diagnostic tests based on server type. Capture available diagnostic logs.
Equipment Alarms	Check LED and/or other status indicators for fault conditions.
Clean Fans and Equipment	Use antistatic vacuum to clean cooling pathways.
Site Controller Redundancy (Trunking)	Roll site controllers with no dropped audio.
Comparators	
Equipment Alarms	Verify no warning/alarm indicators.
Capture Diagnostics	Perform recommended diagnostic tests based on server type. Capture available diagnostic logs.
Clean Fans and Equipment	Use antistatic vacuum to clean cooling pathways.

DISPATCH SITE CHECKLIST – LEVEL 1	
General	
Inspect all Cables	Inspect all cables and connections to external interfaces are secure.
Mouse and Keyboard	Verify operation of mouse and keyboard.
Configuration File	Verify each operator position has access to required configuration files.
Console Operator Position Time	Verify console operator position time is consistent across all operator positions.
Screensaver	Verify screensaver set as Customer prefers.
Screen Performance	Verify screen operational and is not suffering from dead pixels or image burn-in that prevent user operation.
Touchscreen	Verify touchscreen operation, if present.
Cabling/Lights/Fans	Visual inspection of all equipment cabling, lights, and fans
Filters/Fans/Dust	Clean all equipment filters and fans and remove dust.
Monitor and Hard Drive	Confirm monitor and hard drive do not "sleep".
DVD/CD	Verify and clean DVD or CD drive.
Time Synchronization	Verify console time is synchronized with NTP server
Anti-Virus	Verify anti-virus is enabled and that definition files have been updated within two weeks of current date.
Headset Unplugged Testing	
Speakers	Test all speakers for audio quality, volume, static, drop-outs, and excess hiss when turned up.
Channel Audio in Speaker	Verify selected channel audio in select speaker only.
Footswitch Pedals	Verify both footswitch pedals operational.
Radio On-Air Light	Verify radio on-air light comes on with TX (if applicable).
Headset Plugged In Testing	

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Radio TX and RX	Verify radio TX/RX from both headset jacks. Verify levels OK. Check volume controls for noise, static, or drop-outs.
Speaker Mute	Verify speaker mutes when muted.
Telephone Operation	Verify telephone operational through both headset jacks. Check volume controls for noise, static, or drop-outs.
Audio Switches	Verify audio switches to speaker when phone off-hook if interfaced to phones.
Radio Takeover in Headset	Verify radio-takeover in headset mic when phone is off-hook, with mic switching to radio and muting phone during push-to-talk.
Other Tests	
Phone Status Light	Verify phone status light comes on when phone is off-hook (if applicable).
Desk Microphone Operation	Confirm desk mic operation (if applicable).
Radio Instant Recall Recorder (“IRR”) Operation	Verify radio IRR operational on Motorola Solutions dispatch (if applicable).
Telephone IRR Operation	Verify telephone IRR operational on Motorola Solutions dispatch, if on radio computer.
Recording	Verify operator position being recorded on long term logging recorder, if included in service agreement
Computer Performance Testing	
Computer Reboot	Reboot operator position computer.
Computer Operational	Confirm client computer is fully operational (if applicable).
Audio Testing	
Conventional Resources	Confirm all conventional resources are functional, with adequate audio levels and quality.
Secure Mode	Confirm any secure talkgroups are operational in secure mode.
Trunked Resources	Confirm all trunked resources on screen are functioning by placing a call in both directions, at the Customer's discretion, and at a single operator position
Backup Resources	Confirm backup resources are operational.
Logging Equipment Tests	
Recording - AIS Test	Verify audio logging of trunked calls.
Recording	With Customer assistance, test operator position logging on recorder.
System Alarms	Review alarm system on all logging equipment for errors.
Capture Diagnostics	Perform recommended diagnostic tests based on equipment, and capture available diagnostic logs.
Verify System software Physical media	Perform audit of software media on site. Verify that versions, KC numbers, and types match what is deployed to Customer server.
Playback Station (Motorola Solutions Provided)	
Capture Diagnostics	Perform recommended diagnostic tests based on equipment, and capture available diagnostic logs.
Recall Audio	Verify that radio and telephone audio can be recalled.

RF SITE CHECKLIST – LEVEL 1	
RF PM Checklist	
Equipment Alarms	Verify no warning or alarm indicators. Verify AC/DC converter, RMC have been wired correctly on D series site
Clean Fans and Equipment	Use an antistatic vacuum to clean cooling pathways.
Site Frequency Standard Check	Check LEDs for proper operation, PCA screens indicating potential faults for proper operation
Basic Voice Call Check	Voice test each voice path, radio to radio.
Trunking Control Channel Redundancy	Roll control channel, test, and roll back if the site has GTR stations. This test is not applicable for D series stations
Trunking Site Controller Redundancy, ASTRO 25 Site Repeater only	Roll site controllers with no dropped audio if the site has GTR stations. This test is not applicable for D series stations
PM Optimization Workbook (See **Site Performance Evaluation Procedures**)	Complete Base Station Evaluation tests - Frequency Error, Modulation Fidelity, Forward at Set Power, Reverse at Set Power, and Gen Level Desense no TX. Update station logs.

MOSCAD CHECKLIST – LEVEL 1	
MOSCAD Server	
Equipment Alarms	Verify no warning or alarm indicators.
Check Alarm/Event History	Review MOSCAD alarm and events to find if there are chronic issues.
Windows Event Logs	Review Windows event logs. Save and clear if full.
Password Verification	Log in to site devices to verify passwords. Document changes if any found.
Verify System software Physical media	Perform audit of software media on site. Verify that versions, KC numbers, and types match what is deployed to Customer server.
MOSCAD Client	
Equipment Alarms	Verify no warning or alarm indicators.
Check Alarm / Event History	Review MOSCAD alarm and events to find if there are chronic issues.
Windows Event Logs	Review Windows event logs. Save and clear if full.
Password Verification	Site devices to verify passwords. Document changes if any found.
Verify System software Physical media	Perform audit of software media on site. Verify that versions, KC numbers, and types match what is deployed to Customer server.
MOSCAD RTUs	
Equipment Alarms	Verify no warning or alarm indicators.
Verify Connectivity	Verify connectivity
Password Verification	Site devices to verify passwords. Document changes if any found.

Check Alarm/Event History	Review MOSCAD alarms and events to find if there are chronic issues.
Verify System software Physical media	Perform audit of software media on site. Verify that versions, KC numbers, and types match what is deployed to Customer server.

FACILITIES CHECKLIST – LEVEL 1	
Visual Inspection Exterior	
Antenna Site Registration Sign	Verify that the Antenna Site Registration sign is posted.
Warning Sign - Tower	Verify that a warning sign is posted on the tower.
Warning Sign - Gate	Verify that a warning sign is posted at the compound gate entrance.
10 Rule Sign	Verify that a 10 rules sign is posted on the inside of the shelter door.
Outdoor Lighting	Verify operation of outdoor lighting and photocell.
Exterior of Building	Check exterior of building for damage and disrepair.
Fences / Gates	Check fences and gates for damage and disrepair.
Landscape / Access Road	Check landscape and access road for accessibility.
Visual Inspection Interior	
Electrical Surge Protectors	Check electrical surge protectors for alarms.
Emergency Lighting	Verify emergency lighting operation.
Indoor Lighting	Verify indoor lighting.
Equipment Inspection	Visually inspect that all hardware, including equipment, cables, panels, batteries, and racks, is in acceptable physical condition for normal operation.
Regulatory Compliance (License, ERP, Frequency, Deviation)	Check for site and station FCC licensing indicating regulatory compliance.
Clean Fans and Equipment	Use antistatic vacuum to clean cooling pathways.
UPS	
Visual inspection (condition, cabling)	Check for damage, corrosion, physical connections, dirt and dust, and error indications.
Generator	
Visual Inspection	Check panel housing for cracks, rust, and weathering. Check physical connections for corrosion, dirt and dust, or other abnormal conditions.
Fuel	Verify fuel levels in backup generators, document date of last fuel delivered from fuel service provider.
Oil	Check the oil dipstick for proper level. Note condition of oil.
Verify operation (no switchover)	Verify generator running and check ease or difficulty of start. Is generator "throttling" or running smooth? Any loud unusual noise? Document any concerns or abnormal conditions.
Motorized Dampers	Check operation
HVAC	
Air Filter	Check air filter and recommend replacement if required.

Coils	Check coils for dirt and straightness.
Outdoor Unit	Check that outdoor unit is unobstructed.
Wiring	Check wiring for insect and rodent damage.
Cooling / Heating	Check each HVAC unit for cooling/heating.
Motorized Dampers	Check operation.

MICROWAVE CHECKLIST LEVEL 1	
General	
Transport Connectivity	Confirm transport performance by viewing UEM for site link warnings or errors.
Backhaul Monitoring	Monitor UEM status, including alarms, logs, and events, for all links. If UEM not used to monitor microwave, then use approved vendor-provided microwave alarm management server.
Radio	
Alarms	Check alarm and event history.
Software	Verify version of application.
TX Frequency	Verify transmit frequency.
TX Power	Verify transmit power.
RX Frequency	Verify receive frequency.
RX Signal Level	Verify receive signal level and compare with install baseline documentation.
Save configuration	Save current configuration for off-site storage.
Waveguide	
Visual Inspection	Inspect for wear or dents from ground using binoculars.
Connection Verification	Verify all connections are secured with proper hardware from ground using binoculars.
Dehydrator	
Visual Inspection	Inspect moisture window for proper color.
Pressure Verification	Verify pressure of all lines.
Re-Pressurization	Bleed lines temporarily to verify the dehydrator re-pressurizes.
Run Hours	Record number of hours ran.

TOWER CHECKLIST – LEVEL 1	
Structure Condition	
Rust	Check structure for rust.
Cross Members	Check for damaged or missing cross members.

Safety Climb	Check safety climb for damage.
Ladder	Verify that ladder system is secured to tower.
Welds	Check for cracks or damaged welds.
Outdoor lighting/photocell	Test outdoor lighting and photocell.
Drainage Holes	Check that drainage holes are clear of debris.
Paint	Check paint condition.
Tower Lighting	
Lights/Markers	Verify all lights and markers are operational.
Day/Night Mode	Verify day and night mode operation.
Power Cabling	Verify that power cables are secured to tower.
Antennas and Lines	
Antennas	Visually inspect antennas for physical damage from ground using binoculars.
Transmission Lines	Verify that all transmission lines are secure on the tower.
Grounding	
Structure Grounds	Inspect grounding for damage or corrosion
Guy Wires	
Tower Guys	Visually inspect guy wires for fraying, loss of tension, or loss of connection.
Guy Wire Hardware	Check hardware for rust.
Concrete Condition	
Tower Base	Check for chips or cracks.

7.5 Site Performance Evaluation Procedures

The Preventive Maintenance service includes the site performance evaluation procedures listed in this section.

ASTRO 25 SITE PERFORMANCE
Antennas
Transmit Antenna Data
Receive Antenna System Data
Tower Top Amplifier Data
FDMA Mode
Base Radio Transmitter Tests
Base Radio Receiver Tests
Base Radio Transmit RFDS Tests
Receive RFDS Tests with TTA (if applicable)
Receive RFDS Tests without TTA (if applicable)

TDMA Mode
Base Radio TDMA Transmitter Tests
Base Radio TDMA Receiver Tests
TDMA Transmit RFDS Tests
TDMA Receive RFDS Tests with 432 Diversity TTA
TDMA Receive RFDS Tests with 2 Independent TTA's (if applicable)
TDMA Receive RFDS Tests without TTA (if applicable)

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Section 8

ASTRO 25 Security Update Service Statement of Work

Overview

Motorola Solutions' ASTRO® 25 Security Update Service (SUS) provides pretested security updates, minimizing cyber risk and software conflicts. These security updates contain operating system security patches and antivirus definitions that have been validated for compatibility with ASTRO 25 systems. Security update delivery is determined by the options included as part of this service. Inclusions indicates if options are included as part of this service.

This Statement of Work (SOW), including all of its subsections and attachments, is an integral part of the applicable agreement (Agreement) between Motorola Solutions, Inc. (Motorola Solutions) and the customer (Customer).

In order to receive the services as defined within this SOW, the Customer is required to keep the system within a standard support period as described in Motorola Solutions' Software Support Policy (SwSP). A Customer Support Agreement for Security Update Services is designed for customers operating their ASTRO system beyond the Standard Support Period as dictated by Motorola Solutions Software Support Policy. By entering into this Agreement, the Customer agrees to migrate to a release that is within the Standard Support Period of the Motorola Solutions Software Support Policy by the end of the Customer Support Agreement Term.

8.1 Description of Service

Motorola Solutions uses a dedicated information assurance lab to test and validate security updates. Motorola Solutions deploys and tests security updates in the lab to check for and prevent potential service degradation.

Motorola Solutions releases tested, compatible security updates for download and installation. Once security updates are verified by the SUS team, Motorola Solutions uploads them to a secure website and sends a release notification email to the Customer contact to inform them that the security update release is available. If there are any recommended configuration changes, warnings, or workarounds, the SUS team will provide documentation with the security updates on the secure website.

With the base service, the Customer will be responsible for downloading security updates, installing them on applicable components, and rebooting updated components. Additional options are available for Motorola Solutions to deploy security updates, reboot servers and workstations, or both.

8.1.1 On-site Delivery

If On-site Delivery is included with SUS, Motorola Solutions provides trained technician(s) to install security updates at the Customer's location. The technician downloads and installs available security updates and coordinates any subsequent server and workstation reboots. On-Site delivery is not available for the optional transport network updates for routers, firewalls and switches. If onsite

transport network updates are required please discuss this with your Motorola Solutions Customer Support Manager.

8.1.2 Reboot Support

If Reboot Support is included with SUS, Motorola Solutions provides technician support to reboot impacted Microsoft Windows servers and workstations after operating system security patches have been installed.

8.2 Scope

SUS includes pretested security updates for the software listed in Table 1: Update Cadence. This table also describes the release cadence for security updates.

Table: Update Cadence

Software	Update Release Cadence
Antivirus Definition Files	Weekly
Microsoft Windows	Monthly
Microsoft SQL Server	Quarterly
Microsoft Windows third party (i.e. Adobe Reader)	Monthly
Red Hat Linux (RHEL)	Quarterly
VMWare ESXi Hypervisor (A2024 or earlier only)	Quarterly
PostgreSQL	Quarterly
Antivirus Software Patch(es)	Quarterly
Server Firmware Updates	Quarterly
QNAP Firmware	Quarterly
Juniper Firewall Updates	Bi-Annually*
Juniper Router Updates	Bi-annually*
Fortinet Firewall Updates	As required - no regular cadence*
Juniper Switch Updates	As required - no regular cadence*
Aruba Switch Updates	As required - no regular cadence*

*To receive the updates for ASTRO Transport Network devices, the Customer is required to “Opt-In”. Please see Section 8.3 below.

8.3 Inclusions

Supported ASTRO 25 core types and security update delivery methods are included below in Table: SUS Packages. This table indicates if Motorola Solutions will provide any SUS optional services to the

Customer. SUS supports the current Motorola Solutions ASTRO 25 system release and aligns with the established Software Support Policy (SwSP).

Motorola Solutions reserves the right to determine, which releases are supported as business conditions dictate. Additional charges may apply in the event of supporting older releases. Contact Motorola Solutions' assigned Customer Support Manager (CSM) for the latest supported releases.

Table: SUS Packages

Service	ASTRO 25 Core Type	Included
Security Update Service Customer Self-installed	Standard Core Simplified Core	
Security Update Service Customer Self-installed (Transport Network Updates)*	Standard Core Simplified Core	X
Security Update Service with Reboot Support	Standard Core Simplified Core	
Security Update Service with On-site Delivery	Standard Core Simplified Core	

*To receive the updates for ASTRO Transport Network devices, the Customer is required to "Opt-In". Please see Section 1.4.

Responsibilities for downloading and installing security updates and rebooting applicable hardware are detailed in Section 8.4 Installation and Reboot Responsibilities.

Motorola Solutions Responsibilities

- On the release schedule in Scope, review relevant and appropriate security patches released by Original Equipment Manufacturer (OEM) vendors.
- Release tested and verified security patches to Motorola Solutions' secure website.
- Publish documentation for installation, recommended configuration changes, any identified issue(s), and remediation instructions for each security update release.
- Send notifications by email when security updates are available to download from the secure website.
- For Customers who opt in to receive Transport Network Device Updates (Routers, Firewalls, Switches), Motorola Solutions shall:
    - Coordinate with the Customer to determine when Transport Network Configuration Tool (TNCT) files need to be updated.
    - Coordinate the retrieval of the current TNCT configurations from the Customer's system.
    - Update TNCT files (where applicable) to ensure compatibility with updated device software.
    - Coordinate the deposit of the updated configurations to the Customer's system (prior to the Customer's planned update deployment activity).

Limitations and Exclusions

- Systems with non-standard configurations that have not been certified by Motorola Solutions' Systems Integration and Test (SIT) team are specifically excluded from this service, unless otherwise agreed in writing by Motorola Solutions.
- Interim or unplanned releases outside the supported release cadence.
- Service does not include pretested intrusion detection system (IDS) signature updates for IDS solutions. However, select vendor IDS signature updates are made available via the secure website. The available vendors may change pursuant to Motorola Solutions' business decisions. The Customer is responsible for complying with all IDS licensing requirements and fees, if any.
- This service does not include releases for Motorola Solutions products that are not ASTRO 25 Standard or Simplified Core radio network infrastructure equipment. The following are examples of excluded products: WAVE PTX™, Critical Connect, and VESTA® solutions.
- K Core ASTRO 25 systems are excluded.
- Motorola Solutions product updates are not included in these services.
- Shared network infrastructure firmware, such as transport and firewall firmware, are not included in these services, unless the Customer has opted-in to deploy them and receive configuration support.
- Workstation firmware, BIOS and drivers are not included in these services.
- Motorola Solutions does not represent that it will identify, fully recognize, discover, or resolve all security events or threats, system vulnerabilities, malicious codes or data, backdoors, or other system threats or incompatibilities as part of the service, or that the agreed upon cadence/time of delivery will be sufficient to identify, mitigate or prevent any cyber incident.

Customer Responsibilities

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

- Provide Motorola Solutions with predefined information necessary to complete a Customer Support Plan (CSP) prior to the Agreement start date.
- Provide timely updates on changes of information supplied in the CSP to Motorola Solutions' assigned CSM.
- Update Motorola Solutions with any changes in contact information, specifically for authorized users of Motorola Solutions' secure website.
- Provide means for accessing Motorola Solutions' secure website to collect the pretested files.
- Download and apply only to the Customer's system as applicable, based on the Customer Agreement and the scope of the purchased service. Distribution to any other system or user other than the system/user contemplated by the Customer Agreement is not permitted.
- Implement Motorola Technical Notices (MTN) to keep the system current and patchable.
- Adhere closely to the Motorola Solutions Centralized Managed Support Operations (CMSO) troubleshooting guidelines provided upon system acquisition. Failure to follow CMSO guidelines may cause the Customer and Motorola Solutions unnecessary or overly burdensome remediation efforts. In such cases, Motorola Solutions reserves the right to charge an additional fee for the remediation effort.
- Upgrade system to a supported system release when needed to continue service. Contact Motorola Solutions' assigned CSM for the latest supported releases.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

- For Customers who opt in to receive Transport Network Device Updates (Routers, Firewalls, Switches), the Customer shall:
  - Provide required information regarding the Customer's planned deployment schedule, including proposed update period.
  - Coordinate with Motorola Solutions engineers to provide current network configuration files.
  - Coordinate with Motorola Solutions to upload replacement configuration files (where applicable).
  - Provide the information necessary for to raise a Change Request to cover the period of the transport network update activity prior to deployment of updates.
  - Notify Motorola Solutions when updates are completed.
- Comply with the terms of applicable license agreements between the Customer and non-Motorola Solutions software copyright owners.

8.4 Installation and Reboot Responsibilities

Installation and Reboot responsibilities are determined by the specific SUS package being purchased. Table: Installation and Reboot Responsibilities Matrix contains the breakdown of responsibilities. Inclusions indicates which services are included.

Microsoft Windows servers and workstations often need to be rebooted before security updates take full effect and mitigate vulnerabilities.

Table: Installation and Reboot Responsibilities Matrix

SUS Package	Motorola Solutions Responsibilities	Customer Responsibilities
Customer Self-installed		• Deploy files to the Customer's system as instructed in the "Read Me" text provided on Motorola Solutions' secure website. • When a security update requires a reboot, reboot servers and workstations after security updates are installed.
Customer Self-installed with Transport Network Opt-In	• Update TNCT configurations for compatibility with device updates. • Raise Change requests prior to deployment of updates. • Close Change requests on completion of updates.	• Deploy files to the Customer's system as instructed in the installation procedures provided on Motorola Solutions' secure website. • Deploy updates and restart devices (where applicable).
Security Update Service with On-site Delivery	• Dispatch a technician to deploy pretested files to the Customer's system. • When a security update requires a reboot, reboot servers and workstations after security updates are installed.	• Acknowledge Motorola Solutions will reboot servers and workstations, and agree to timing.

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Security Update Service with Reboot Support	• When a security update requires a reboot, dispatch a technician to reboot servers and workstations after security updates are installed.	• Deploy files to the Customer's system as instructed in the "Read Me" text provided on Motorola Solutions' secure website.

8.5 Disclaimer

This service tests OEM security updates. Delivering security updates for specific software depends on OEM support for that software. If an OEM removes support (e.g. end-of-life) from deployed software, Motorola Solutions may work with the OEM to reduce the impact, but may remove support for the affected software from this service without notice.

OEMs determine security update schedules, supportability, or release availability without consultation from Motorola Solutions. Motorola Solutions will obtain and test security updates when they are made available, and incorporate those security updates into the next appropriate release.

All security updates are important. This service is intended to balance the security and compatibility of tested updates with agreed upon time/cadence of delivery. Customer assumes the risk of this inherent tradeoff.

Motorola Solutions disclaims any warranty with respect to pretested database security updates, hypervisor patches, operating system software patches, intrusion detection sensor signature files, or other third-party files, express or implied. Further, Motorola Solutions disclaims any warranty concerning non-Motorola Solutions software and does not guarantee Customers' systems will be error-free or immune to security breaches as a result of these services.

Additionally, Customers who opt-in to receive configuration files for updating their transport network devices, and that elect to self-install those updates, understand and agree to accept responsibility for and the risks associated with self-installation, which may include service interruptions or system downtime.

Section 9

ASTRO 25® Remote Security Update Service Statement of Work

Overview

Motorola Solutions, Inc.'s (Motorola) ASTRO® 25 Remote Security Update Service (RSUS) provides pretested security updates, minimizing cyber risk and software conflicts. These security updates contain operating system security patches and antivirus definitions that have been validated for compatibility with ASTRO 25 systems. Motorola will remotely deliver tested security updates to the Customer using a network connection. Reboot responsibility is determined by which options are included as part of this service.

The ASTRO 25 Monthly Security Update Service (SUS) is a prerequisite for RSUS. Please see the Statement of Works for: ASTRO 25 SUS Statement of Work.

This Statement of Work (SOW), including all of its subsections and attachments, is an integral part of the applicable agreement (Agreement) between Motorola and the customer (Customer).

In order to receive the services as defined within this SOW, the Customer is required to keep the system within a standard support period as described in Motorola's Software Support Policy (SwSP).

9.1 Description of Service

Motorola remotely installs pretested security updates on the applicable ASTRO 25 system components, as defined in Appendix 1.

Note that some ASTRO 25 system components may be covered by the self-installed SUS service and not RSUS (RSUS Exceptions).

If the Customer is unable to apply updates to RSUS exceptions, Motorola can provide Onsite SUS, whereby the Motorola field service team attend Customer premises to install the updates.

Motorola remotely installs pretested security updates on the applicable ASTRO 25 system components. Motorola tests security updates for compatibility with ASTRO 25 in a dedicated information assurance lab.

Motorola will install compatible ASTRO 25 security updates using a remote connection. After installing tested security updates remotely, Motorola provides the Customer with a report outlining the updates made to the Customer's system. This report will inform the Customer of security update network transfers and installation statuses.

9.1.1 Remote Update Requirements

An always on, reliable connection from the Customer's network to Motorola is required to enable this service. The minimum bandwidth required is 20 Mbps or higher. If the Customer elects to provide a

bandwidth lower than the minimum specification, the ability to deliver the service could be impacted. Additional hardware (such as a secure router) may be provided to deliver the services. If the Customer is unable to install the equipment or provide a suitable Internet connection, please contact your CSM to discuss options. Please note, if an existing connection is available, this may be suitable to deliver the service (subject to minimum bandwidth requirement).

9.1.2 Application of Prerequisite Motorola Technical Notices (MTN)

In some instances, MTNs must be applied to enable Motorola to remotely deploy the latest security updates. MTN installation is not part of RSUS. In the event that Motorola is prevented from deploying security updates due to incomplete implementation of prerequisite MTNs, Motorola will raise a service incident and notify the Customer. Once necessary MTNs are applied to the Customer's system, Motorola will continue to remotely deploy security updates.

9.1.3 Updates to System Components in the Customer Enterprise Network

Connections to other networks, herein referred to as Customer Enterprise Network (CEN), are delineated by firewalls. All security updates deployed by RSUS are specific to the equipment included in the ASTRO 25 radio network. The only exceptions are those identified as RSUS exceptions in Appendix 1.

The Customer may request a quote, via the CSM, for Motorola to remotely install updates to eligible systems that are in the Customer's CEN.

The Customer must make the appropriate configuration changes to their firewall giving logical access and a network path to allow Motorola to remotely install the requisite patches.

9.1.4 Windows Reboot Following Security Update Installation

It is a critical requirement that Windows systems are rebooted following the installation of security updates. In the case of RSUS, this is the responsibility of the Customer.

Failure of the Customer to fulfill reboot responsibilities as described in Table: Reboot Responsibilities Matrix exposes systems to security threats. Until reboot, the system is not updated.

It will also delay execution of future RSUS updates, with a risk of failed RSUS scheduling and unnecessary Customer impact.

If Customers require further support from Motorola to reboot following Windows update deployment and installation, please contact your CSM who can discuss options for Reboot Support.

9.1.5 Reboot Support

If the Reboot Support service is sold to complement RSUS, Motorola provides technician(s) to reboot impacted Microsoft Windows servers and workstations after operating system security patches have been installed.

- The RSUS team will notify all listed contacts one week prior to patching to all required contacts (identified during service onboarding).
- On completion of patching, a final report is sent via email to the listed contacts.
- The notification will state that patching is complete and systems need to be rebooted.

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- This process is repeated monthly.

Reboot Support requires that the Customer representative works with Motorola technicians to plan when reboots will be undertaken to reduce the operational impact.

9.2 Scope

RSUS includes pretested security updates for the software listed below in Table: Update Cadence. This table also describes the release cadence for security updates.

Table: Update Cadence

Software	Update Release Cadence
Antivirus Definition Files	Weekly
Microsoft Windows	Monthly
Microsoft Windows SQL Server	Quarterly
Red Hat Linux (RHEL)	Quarterly
VMWare ESXi Hypervisor	Quarterly
Trellix (McAfee) Patch(es)	Quarterly
Dot Hill DAS Firmware	Quarterly
HP SPP Firmware	Quarterly

Motorola installs security updates during normal business hours. Normal business hours are defined as 8 a.m. to 5 p.m. Central Standard Time Monday through Friday, excluding public holidays.

The Customer may submit a formal request that Motorola personnel work outside of these hours. The Customer will need to pay additional costs for work to be completed outside of normal business hours.

Motorola will provide an Impact Timeline (ITL) to the Customer to show installation tasks scheduled, including preparation work and the transfer of security updates to local storage or memory. Core Server reboots or zone controller rollover will be initiated at the times shared in the ITL.

It is a critical requirement that Windows systems are rebooted following the installation of security updates. In the case of RSUS, this is the responsibility of the Customer.

Intrusive security updates require Customer coordination, may require hardware reboots and zone controller rolling (switching from one zone controller to the other) to fully implement. Systems with redundant zone controllers (L2, M2, M3) have low downtime (minutes) as the zone controllers are rolled but systems with single zone controllers (L1, M1) will be down for longer periods. While rolling the zone controllers, the system will operate in “site trunking” mode. The Customer will need to be aware of these operational impacts, and coordinate events with users.

9.2.1 Tenanted Customers Access to Antivirus Updates

Where a Customer is a Tenant Customer (for example, a Public Safety Access Point / Dispatch Centre) on a Core system owned and operated by another organization, any Tenant customer systems such as dispatch consoles need to be able to access the core Central Security Management Server (CSMS).

The RSUS team will need permission from the Core system owners to allow connectivity from the Core system to any RSUS entitled Tenant Customers.

9.3 Inclusions

Supported ASTRO 25 core types and security update delivery methods are included below in Table: SUS Packages. This table indicates if Motorola will provide any RSUS optional services to the Customer. RSUS supports the current Motorola ASTRO 25 system release and aligns with the established Software Support Policy (SwSP).

Motorola reserves the right to determine which releases are supported as business conditions dictate. Additional charges may apply in the event of supporting releases that are no longer within the Standard Support Period (as defined by the SWSP). Contact Motorola's assigned CSM for the latest supported releases.

Table: SUS Packages

Service	ASTRO 25 Core Type	Include
Remote Security Update Service	L Core M Core Simplified Core	X
Remote Security Update Service with Reboot Support	L Core M Core Simplified Core	

Responsibilities for rebooting applicable hardware are detailed in section Reboot Responsibilities.

Motorola Responsibilities

- If required, Motorola will send to the customer a secure router and / or a Network Management Client for installation in the ASTRO 25 system. If the Customer is unable to install, please contact your CSM who will be able to arrange for this to be completed.
- Remotely deploy patches listed in section Scope on the Customer's system. Patches will be installed on the cadence described in that section.
    - As outlined in section Scope, coordinate and communicate with the Customer when installing updates that will require server reboots, workstation reboots, or both.
    - Install non-intrusive updates, like antivirus definitions, as released without coordination.
- In the event that no security updates are released by the Original Equipment Manufacturers (OEM), the Final RSUS Patch Report can be reviewed by the Customer to identify where no new security updates were required.
- Coordinate RSUS activities with any other Motorola system maintenance or other engineering activities with the Customer to minimize downtime, inefficiency and operational impact.

Limitations and Exclusions

- Systems with non-standard configurations that have not been certified by Motorola's Systems Integration and Test (SIT) team are specifically excluded from this service, unless otherwise agreed in writing by Motorola.
- Interim or unplanned releases outside the supported release cadence.
- Service does not include pretested intrusion detection system (IDS) signature updates for IDS solutions. However, select vendor IDS signature updates are made available via the secure website. The available vendors may change pursuant to Motorola's business decisions. The Customer is responsible for complying with all IDS licensing requirements and fees, if any.
- This service does not include releases for Motorola products that are not ASTRO 25 L, M, and Simplified Core radio network infrastructure equipment. The following are examples of excluded products: WAVE PTX™, Critical Connect, and VESTA® solutions.
- K Core ASTRO 25 systems are excluded.
- Motorola product updates are not included in these services.
- Shared network infrastructure firmware, such as transport and firewall firmware are not included in these services.
- This service excludes the delivery of MTNs to the customer system.
- Motorola does not represent that it will identify, fully recognize, discover, or resolve all security events or threats, system vulnerabilities, malicious codes or data, backdoors, or other system threats or incompatibilities as part of the service, or that the agreed upon cadence/time of delivery will be sufficient to identify, mitigate or prevent any cyber incident.
- Motorola shall provide Customers with a list of MTNs that are prerequisite for execution of the RSUS service.

Customer Responsibilities

- This service requires connectivity from Motorola to the Customer's ASTRO 25 system. If required, procure internet connectivity before the service commences, and maintain it for the duration of the service contract.
- Refrain from making uncertified changes to the ASTRO 25 system. Consult with Motorola before making changes to the ASTRO 25 system.
- Be aware of the operational impacts of RSUS update installation, and coordinate the update process with users.
- Prerequisite Motorola Technical Notices (MTN) must be applied to enable Motorola to remotely deploy the latest security updates. The list of MTNs that must be applied are available on the SUS secure customer portal.

9.4 Reboot Responsibilities

Microsoft Windows servers and workstations often need to be rebooted before security updates take full effect and mitigate vulnerabilities. Reboot responsibilities are determined by the specific RSUS package being purchased. Table: Reboot Responsibilities Matrix contains the breakdown of responsibilities. Section Inclusions indicates which services are included.

If a Customer chooses not to reboot after an update, whether for operational reasons or convenience, they are accepting the associated risks, which include:

- Greater exposure to cyber security threats and vulnerabilities.
- Impact to implementation of subsequent RSUS Windows updates at the agreed delivery cadence, until the devices are rebooted and at the correct RSUS release.

If Customers require further support from Motorola to reboot following Windows update deployment and installation, please contact your CSM who can discuss options for Reboot Support.

Table: Reboot Responsibilities Matrix

Remote SUS Package	Motorola Responsibilities	Customer Responsibilities
Remote Security Update Service	Provide a report to the Customer's main contact listing the servers or workstations which must be rebooted to ensure installed security updates become effective.	When a security update requires a reboot, reboot servers and workstations after security updates are installed. When remote deployment is in progress, it may be necessary for multiple reboots to be coordinated with Motorola Solutions.
Remote Security Update Service with Reboot Support	When a security update requires a reboot, dispatch a technician to reboot servers and workstations after security updates are installed.	

9.5 Disclaimer

This service tests OEM security updates. Delivering security updates for specific software depends on OEM support for that software. If an OEM removes support (e.g. end-of-life) from deployed software, Motorola may work with the OEM to reduce the impact, but may remove support for the affected software from this service without notice.

OEMs determine security update schedules, supportability, or release availability without consultation from Motorola. Motorola will obtain and test security updates when they are made available, and incorporate those security updates into the next appropriate release.

All security updates are important. This service is intended to balance the security and compatibility of tested updates with agreed upon time/cadence of delivery. Customer assumes the risk of this inherent tradeoff.

Motorola disclaims any warranty with respect to pretested database security updates, hypervisor patches, operating system software patches, intrusion detection sensor signature files, or other third-party files, express or implied. Further, Motorola disclaims any warranty concerning non-Motorola software and does not guarantee Customers' systems will be error-free or immune to security breaches as a result of these services.

9.6 Appendix 1: RSUS Coverage Matrix

he following table defines which components are covered by the Remote SUS service.

The ASTRO 25® Point Service Software Support Policy applies. Security Update Service (SUS) and Remote Security Update Service (RSUS) support only systems that are within the Standard Software Support Period (up to 4 years after general release). Support is dependent on connectivity to the (RNI) Radio Network Infrastructure.

Table: RSUS Covered Components

SOFTWARE	UPDATE RELEASE CADENCE	PRODUCT DEPENDS ON DEVICE NETWORK LOCATION IN RNI OR CONNECTIVITY SETTINGS *
Antivirus Definition Files	Weekly	Based on automated (CSMS) Core Security Management Server configurations
Microsoft Windows	Monthly	(AMS) Advanced Messaging Server (AuC) Authentication Center Client (AuC) Authentication Center Server (CSMS) Core Security Management Server (DC) Domain Controller (IPPBX) (ETI) Enhanced Telephone Interconnect (KMF) Key Management Framework Client (KMF) Key Management Framework Server (MCC) Master Control Console 5500 (MCC) Master Control Console 7100 (MCC) Master Control Console 7500 / (AIS) Archiving Interface Server (MCC) Master Control Console 7500 E (MCC) Master Control Consoles 7500 E (NM) Network Management Client (OPSOC) On-Prem Security Operations Center (RM) Radio Management Client (RM) Radio Management Server MACH Alert (FSA) Fire Station Alerting Marvlis AVL Desktop Monitor Marvlis Server NICE (AIS) Archiving Interface Server NICE Backup Server NICE IP Radio Logger NICE Replay Workstation Proxy 7000 Transcoder Verint Logging Recorder Server Verint Workstation
Microsoft Windows SQL Server	Quarterly	(CSMS) Core Security Management Server
Red Hat Linux (RHEL)	Quarterly	(ATR) Air Traffic Router

		(BAR) Backup and Restore Server (IPCAP) IP Packet Capture (ISGW) Intersystem Gateway (LM) License Manager (LMP) LMP Multicast Proxy (NTP) Network Time Protocol (PDG) Packet Data Gateway (SSS) System Statistical Service (Syslog) Syslog Service (UCS) User Configuration Server (UEM) Unified Event Manager (UNC) Unified Network Configurator (ZC) Zone Controller (ZDS) Zone Database Service (ZSS) Zone Statistical Server
VMWare ESXi Hypervisor	Quarterly	(VMS) Virtual Management Server
VMWare vCenter	Quarterly	(VCLS) vSphere Cluster Services
McAfee/Trellix Patch(es)	Quarterly	(CSMS) Core Security Management Server
Dot Hill DAS Firmware	Quarterly	4524 4525
HP SPP Firmware	Quarterly	HP Generation 9 HP Generation 10

9.7 Exclusions

The following system components are not covered by RSUS but are covered by the SUS service. If you require assistance to deploy these updates, please contact your CSM to arrange Onsite SUS services.

Table: Excluded Components

Software	Products
Product Lines	(IMW) Intelligent MiddleWare Server WAVE Radio Gateway WAVE Tactical (PA) Personnel Accountability (CEN) Customer Enterprise Network Located Loggers (including Telephony)
Antivirus Definition Files	Stand Alone Deployed Products
Microsoft Windows	(CAM) Console Alias Manager Server Genesis Genwatch3 Genesisworld Performance Management Solutions Client
Microsoft Windows SQL Server	NICE IP Logging Recorder

QNAP	TS453A TS453Be TS453D TS-464
PostgreSQL	(KMF) Key Management Framework Server
McAfee/Trellix Patch(es)	Stand Alone Deployed Products

There may be components not included in the tables above. These components are not covered.

Section 10

ASTRO 25® System Upgrade Agreement Statement of Work

Overview

Utilizing the ASTRO® 25 System Upgrade Agreement (“SUA”) service, the ASTRO25 system is able to take advantage of new functionality and security features while extending the operational life of the system. Motorola Solutions continues to make advancements in on-premise and cloud technologies to bring value to our customers. Cloud technologies enable the delivery of additional functionality through frequent updates ensuring the latest in ASTRO 25 is available at all times.

This Statement of Work (“SOW”), including all of its subsections and attachments is an integral part of the applicable agreement (“Agreement”) between Motorola Solutions, Inc. (“Motorola Solutions”) and the customer (“Customer”).

The Customer is required to keep the system within a standard support period as described in Motorola Solutions’ Software Support Policy (“SwSP”).

10.1 Description of Service

The ASTRO System Upgrade Agreement periodically provides upgrades to system software and cloud platforms, with associated implementation services and hardware changes, to keep the overall ASTRO 25 system in a supportable state for maintenance, repair, overall network health, and security.

10.2 Scope

As system releases become available, Motorola Solutions agrees to provide the Customer with the software, hardware and implementation services required to execute up to one system infrastructure upgrade in each eligible upgrade window over the term of this agreement. The term of the agreement is listed below in Table: SUA Term. The eligible upgrade windows and their duration are illustrated below in Table: Eligible Upgrade Window.

If needed to perform the software upgrades, Motorola Solutions will provide updated and/or replacement hardware for covered infrastructure components. System release upgrades, when executed, will provide an equivalent level of functionality as that originally purchased and deployed by the Customer. At Motorola Solutions’ option, new system releases may introduce new features or enhancements that Motorola Solutions may offer for purchase. These new features, available separately for purchase, are not part of the System Upgrade Agreement.

With the addition of the cloud services, Motorola Solutions agrees to provide continuous updates to the cloud core to enable the delivery of additional functionality. Cloud updates will be more frequent than the ASTRO 25 system release upgrades and will occur outside the defined eligible upgrade windows in Table: Eligible Upgrade Window. Motorola Solutions may in its sole discretion automatically apply the cloud updates as they become available.

Table: SUA Term

Duration	15 years from final acceptance

Table: Eligible Upgrade Window

First Eligible Upgrade Window	Second Eligible Upgrade Window
Year 1 Warranty	Year 8 following the start of warranty

The methodology for executing each system upgrade is described in the following sections from *Upgrade Planning and Preparation* through *Section Upgrade Completion*.

ASTRO 25 SUA pricing is based on the system configuration outlined in Section System Pricing Configuration. This configuration is to be reviewed annually from the contract effective date. Any change in system configuration may require an ASTRO 25 SUA price adjustment.

The price quoted for ASTRO 25 SUA requires the Customer to choose a certified system upgrade path in Section ASTRO 25 System Release Upgrade Paths. Should the Customer elect an upgrade path other than one listed in Section ASTRO 25 System Release Upgrade Paths, the Customer agrees that additional fees may be incurred to complete the implementation of the system upgrade. In this case, Motorola Solutions agrees to provide a price quotation for any additional materials and services necessary.

10.3 Inclusions

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

The ASTRO 25 SUA only covers the products that are outlined in this section and does not cover all products. Refer to Section Limitations and Exclusions for examples of exclusions and limitations.

The ASTRO 25 SUA covers ASTRO 25 certified software releases for the following products provided they were present at the time of contract execution and provided as part of the ASTRO 25 certified solution:

- Servers.
- Workstations.
- Laptops.
- Firewalls.
- Routers.
- LAN switches.
- MCC 7100 Dispatch Consoles.
- MCC 7500 Dispatch Consoles.
- MCC 7500E Dispatch Consoles.
- GTR 8000 Base Stations.
- GCP 8000 Site Controllers.
- DSC 8000 Site Controllers.
- GCM 8000 Comparators.
- Motorola Solutions logging interface equipment.

- PBX switches for telephone interconnect.
- NICE and Verint IP logging solutions (if software, hardware and lifecycle purchased through Motorola Solutions).

The following hardware components, if originally provided by Motorola Solutions as part of the certified ASTRO 25 release, are eligible for full product replacement when necessary to support the system release upgrade:

- Servers.
- Workstations.
- Laptops.
- Firewalls.
- Routers.
- LAN switches.
- PBX switches for telephone interconnect.
- CirrusNode (Edge Compute Device).
- Cirrus Cloud Firewall.
- Hub Site Router.
- Hub Site Switch.
- Command Central Hub
- ActiveEye Remote Security Server
- MPLS Backhaul Router (optional)

The following hardware components, if originally provided by Motorola Solutions, are eligible for board-level replacement when necessary to support the system release upgrade. A “board-level replacement” is defined as any Field Replaceable Unit (“FRU”) for the products listed below:

- GTR 8000 Base Stations.
- GCP 8000 Site Controllers.
- GCM 8000 Comparators.
- MCC 7500 Dispatch Console Voice Processing Module.

The ASTRO 25 SUA applies only to system release upgrades within the ASTRO 25 7.x platform.

The ASTRO 25 SUA entitles the Customer to eligible past software versions for the purpose of downgrading product software to a compatible release version. Past versions from within the Standard Support Period will be available.

ASTRO 25 SUA makes available the subscriber radio software releases that are shipping from the factory during the coverage period.

10.4 Upgrade Planning and Preparation

All items listed in this section are to be completed at least 6 months prior to a scheduled upgrade.

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Motorola Solutions Responsibilities

- Obtain and review infrastructure system audit data as needed.
- Identify the backlog accumulation of security patches and antivirus upgrades needed to implement a system release. If applicable, provide a quote for the necessary labor, security patches and antivirus upgrades.
- If applicable, identify additional system hardware needed to implement a system release.
- Identify Customer provided hardware that is not covered under this agreement, or where the Customer will be responsible for implementing the system release upgrade software.
- Identify the equipment requirements and the installation plan.
- Advise the Customer of probable impact to system users during the cloud update and the actual field upgrade implementation.
- If applicable, advise the Customer on the network connection specifications necessary to perform the system upgrade.
- Where necessary to maintain existing functionality and capabilities, deploy and configure any additional telecommunications equipment necessary for connectivity to the cloud based technologies.
- Assign program management support required to perform the certified system upgrade. Prepare an overall project schedule identifying key tasks and personnel resources required from Motorola Solutions and Customer for each task and phase of the upgrade. Conduct a review of this schedule and obtain mutual agreement of the same.
- Assign installation and engineering labor required to perform the certified system upgrade.
- Provide access to cloud training videos, frequently asked questions, and help guide.
- Deliver release impact and change management training to the primary zone core owners, outlining the changes to their system as a result of the upgrade path elected. This training needs to be completed at least 12 weeks prior to the scheduled upgrade. This training will not be provided separately for user agencies who reside on a zone core owned by another entity. Unless specifically stated in this document, Motorola Solutions will provide this training only once per system.

Customer Responsibilities

- Contact Motorola Solutions to schedule and engage the appropriate Motorola Solutions resources for a system release upgrade and provide necessary information requested by Motorola Solutions to execute the upgrade. Review upgrade schedule and reach mutual agreement of the same.
- Identify hardware not purchased through Motorola Solutions that will require the system release upgrade software.
- Purchase the security patches, antivirus upgrades and the labor necessary to address any security upgrades backlog accumulation identified in Section Motorola Solutions Responsibilities, if applicable. Unless otherwise agreed in writing between Motorola and Customer, the installation and implementation of accumulated backlog security patches and network updates is the responsibility of the Customer.
- If applicable, provide network connectivity at the zone core site(s) for Motorola Solutions to use to download and pre-position the software that is to be installed at the zone core site(s) and pushed to remote sites from there. Motorola Solutions will provide the network connection

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specifications, as listed in Section Motorola Solutions Responsibilities. Network connectivity must be provided at least 12 weeks prior to the scheduled upgrade. In the event access to a network connection is unavailable, the Customer may be billed additional costs to execute the system release upgrade.

- Assist in site walks of the system during the system audit when necessary.
- Provide a list of any FRUs and/or spare hardware to be included in the system release upgrade when applicable. Upon reasonable request by Motorola Solutions, Customer will provide a complete serial and model number list of the equipment. The inventory count of Customer FRUs and/or spare hardware to be included as of the start of the SUA is included in Section System Pricing Configuration.
- Acknowledge that new and optional system release features or system expansions, and their required implementation labor, are not within the scope of the SUA. The Customer may purchase these under a separate agreement.
- If not provided by Motorola Solutions, maintain an internet connection between the on premise radio solution and the cloud platform.
- Participate in release impact training at least 12 weeks prior to the scheduled upgrade. This applies only to primary zone core owners. It is the zone core owner's responsibility to contact and include any user agencies that need to be trained, or to act as a training agency for those users not included.

10.5 System Readiness Checkpoint

All items listed in this section are to be completed at least 30 days prior to a scheduled upgrade.

Motorola Solutions Responsibilities

- Perform appropriate system backups
- Work with the Customer to validate that all system maintenance is current
- Work with the Customer to validate that all available security patches and antivirus upgrades have been upgraded on the Customer's system
  - Motorola Solutions reserves the right to charge the Customer for the security patches, antivirus updates and the labor necessary to address any security updates backlog accumulation, in the event that these are not completed by the Customer at the System Readiness Checkpoint.

Customer Responsibilities

- Validate that system maintenance is current.
- Validate that all available security patches and antivirus upgrades to the Customer's system have been completed or contract Motorola Solutions to complete in time for the System Readiness Checkpoint.

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10.6 System Upgrade

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Motorola Solutions Responsibilities

- Perform system infrastructure upgrade for the system elements outlined in this SOW.

Customer Responsibilities

- Inform system users of software upgrade plans and scheduled system downtime.
- Cooperate with Motorola Solutions and perform all acts that are reasonable or necessary to enable Motorola Solutions to provide software upgrade services.

10.7 Upgrade Completion

Motorola Solutions Responsibilities

- Validate all certified system upgrade deliverables are complete as contractually required.
- Confirm with Customer that the cloud is available for beneficial use.

Customer Responsibilities

- Cooperate with Motorola Solutions in efforts to complete any post upgrade punch list items as needed.

10.8 Limitations and Exclusions

The parties acknowledge and agree that the ASTRO 25 SUA does not cover the following products:

- MCC5500 Dispatch Consoles.
- MIP5000 Dispatch Consoles.
- E911 systems.
- Custom software, Computer-aided Dispatch (“CAD”), Records Management Software.
- Data radio devices.
- Laptops, mobile computing devices not purchased through Motorola Solutions.
- Two-way radio subscriber products.
- NICE and Verint products not purchased through Motorola Solutions
- 3rd party logging recorders not certified by Motorola Solutions, ie Eventide
- Genesis products not purchased through Motorola Solutions
- Point-to-point and backhaul products, such as MPLS equipment, microwave terminals, and associated multiplex equipment.
- Items that are consumed in the normal operation of the hardware, such as accessories, microphones, speakers, keyboards, monitors, and printers.

The Customer and Motorola Solutions agree that systems that have non-standard configurations that have not been certified by Motorola Solutions Systems Integration Testing are specifically excluded

from the ASTRO 25 SUA unless otherwise agreed in writing by Motorola Solutions and included in this SOW.

Customer acknowledges that if the system has a Special Product Feature, that it may be overwritten by the software upgrade. Restoration of that feature is not included in the coverage of this SOW.

Support for Customer provided connectivity to the cloud platform is not covered under this agreement.

ASTRO 25 SUA does not cover any hardware or software purchased directly from a third party by the Customer, unless specifically included in this SOW.

The SUA excludes repair or maintenance of any transmission line, antenna, microwave equipment, tower or tower lighting, duplexer, combiner, or multicoupler. Motorola Solutions has no obligations for any transmission medium, such as telephone lines, computer networks, the internet or worldwide web, or for hardware malfunction caused by the transmission medium.

New subscriber radio options and features not previously purchased by the Customer are excluded from ASTRO 25 SUA coverage. Additionally, subscriber software installation and reprogramming are excluded from the ASTRO 25 SUA coverage.

ASTRO 25 SUA does not include repair or replacement of hardware or software that is due to defects that are not corrected by the system release, nor does it include repair or replacement of hardware defects resulting from any nonstandard, improper use or conditions; or from unauthorized installation of software; or excessive wear and tear; or accidental damage, power surges, neglect, or other force majeure events.

Any upgrades to hardware versions and/or replacement hardware required to support new features or those not specifically required to maintain existing functionality are not included. Platform migrations are the replacement of a product with the next generation of that product. Unless otherwise stated, platform migrations such as, but not limited to, stations, comparators, site controllers, consoles, backhaul, and network changes are not included.

Upgrades for equipment add-ons or expansions during the term of this ASTRO 25 SUA are not included in the coverage of this SOW unless otherwise agreed to in writing by Motorola Solutions.

Any implementation services that are not directly required to support the certified system upgrade are not included. Unless otherwise stated, implementation services necessary to provide system expansions, platform migrations, and/or new features or functionality that are implemented concurrently with the certified system upgrade are not included.

ASTRO 25 SUA does not cover or include deliverables included with the Security Update Service. The SUA does not include software support for virus attacks, applications that are not part of the ASTRO 25 system, unauthorized modifications or other misuse of the covered software.

ASTRO 25 SUA does not cover the labor or materials associated with the backlog accumulation of security patches or antivirus updates. Additional fees may apply as outlined in Section Motorola Solutions Responsibilities.

At the time of upgrade, Motorola Solutions will provide the latest applicable software, patches and antivirus updates when and if available, as a part of the system release upgrade. The security patches and antivirus updates delivered as part of this upgrade are intended to bring the system current in all respects but does not imply that the Customer is eligible for ongoing security patching. The upgrade may include 3rd party software such as Microsoft Windows and Server OS, Red Hat Linux, and any Motorola Solutions software service packs that may be available. Motorola Solutions will only provide

patch releases that have been analyzed, pre-tested, and certified in a dedicated ASTRO 25 test lab to ensure that they are compatible and do not interfere with the ASTRO 25 network functionality.

10.9 Special Provisions

The migration of capabilities from ASTRO 25 on-premise infrastructure to the cloud is not considered to be a platform migration and is therefore included in the deliverable of the SUA agreement. Technologies based on cloud architecture will be a part of the Motorola Solutions roadmap and may be subject to additional cloud terms and conditions.

The SUA does not extend to customer-provided software and hardware. Motorola Solutions makes no warrants or commitments about adapting our standard system releases to accommodate customer implemented equipment. If during the course of an upgrade, it is determined that customer provided software and/or hardware does not function properly, Motorola Solutions will notify the customer of the limitations. The customer owns any costs and liabilities associated with making the customer provided software and/or hardware work with the standard Motorola Solutions system release. This includes, but is not limited to, Motorola Solutions costs for the deployment of resources to implement the upgrade once the limitations have been resolved by the customer.

Any Motorola Solutions software, including any system releases, is licensed to Customer solely in accordance with the applicable Motorola Solutions Software License Agreement. Any non-Motorola Solutions Software is licensed to Customer in accordance with the standard license, terms, and restrictions of the copyright owner unless the copyright owner has granted to Motorola Solutions the right to sublicense the Non-Motorola Solutions Software pursuant to the Software License Agreement, in which case it applies and the copyright owner will have all of Licensor's rights and protections under the Software License Agreement. Motorola Solutions makes no representations or warranties of any kind regarding non-Motorola Solutions Software. Non-Motorola Solutions Software may include Open Source Software.

ASTRO 25 SUA coverage and the parties' responsibilities described in this SOW will automatically terminate if Motorola Solutions no longer supports the ASTRO 25 7.x software version in the Customer's system or discontinues the ASTRO 25 SUA program. In either case, Motorola Solutions will refund to Customer any prepaid fees for ASTRO 25 SUA applicable to the terminated period.

If the Customer cancels a scheduled upgrade within less than 12 weeks of the scheduled on site date, Motorola Solutions reserves the right to charge the Customer a cancellation fee equivalent to the cost of the pre-planning efforts completed by the Motorola Solutions Upgrade Operations Team.

The ASTRO 25 SUA annualized price is based on the fulfillment of the system release upgrade in each eligible upgrade window. If the Customer terminates, except if Motorola Solutions is the defaulting party, the Customer will be required to pay for the balance of payments owed in that eligible upgrade window if a system release upgrade has been taken prior to the point of termination.

ASTRO 25 System Release Upgrade Paths

The upgrade paths for standard ASTRO 25 system releases are listed below in Table: Certified Standard ASTRO 25 System Release Upgrade Paths.

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Table: Certified Standard ASTRO 25 System Release Upgrade Paths

ASTRO 25 System Release	Certified Upgrade Paths
Pre-7.17.X	Upgrade to Current Shipping Release
A7.17.X	A2020.1
A7.18	A2021.1
A2019.2	A2021.1
A2020.1	A2022.1

The upgrade paths for high security ASTRO 25 system releases for federal deployments are described below in Table: Certified High Security ASTRO 25 System Release Upgrade Paths.

Table: Certified High Security ASTRO 25 System Release Upgrade Paths

ASTRO 25 High Security System Release	Certified Upgrade Paths
A7.17.X	A2020.HS
A2020.HS	A2022.HS

The release taxonomy for the ASTRO 25 7.x platform is expressed in the form “ASTRO 25 7.x release 20YY.Z”. In this taxonomy, YY represents the year of the release, and Z represents the release count for that release year.

A20XX.HS enhances the ASTRO 25 System release with support for Public key infrastructure (“PKI”) Common Access Card/Personal Identity Verification (CAC/PIV) and with Cyber Security Baseline Assurance.

- The most current system release upgrade paths can be found in the most recent Lifecycle Services bulletin.
- The information contained herein is provided for information purposes only and is intended only to outline Motorola Solutions’ presently anticipated general technology direction. The information in the roadmap is not a commitment or an obligation to deliver any product, product feature or software functionality and Motorola Solutions reserves the right to make changes to the content and timing of any product, product feature, or software release.

10.10 System Pricing Configuration

This configuration is to be reviewed annually from the contract effective date. Any change in system configuration may require an ASTRO 25 SUA price adjustment.

Table: System Configuration

System Configuration	
Master Site Configuration	
Cloud based Master Site	0
Cloud based DSR Site	0
On-Premise Master Site	1
On-Premise DSR Site	1
System Level Features	

System Configuration	
Standalone servers (Critical Connect / Smart Connect / Edge Server)	2
MOSCAD NFM RTU (typically 1 per site location)	5
MOSCAD NFM / SDM Clients	0
Network Management Clients	4
Unified Network Services (UNS) or KMF	0
Telephone Interconnect	0
Security Configuration	
Distinct CEN Network Segments	1
Monitored CEN Endpoints	0
AERSS Sensors	3
Firewalls	5
Intrusion Detection Sensor (IDS)	0
Centralized Event Logging (SysLog)	1
Zone Core Protection (ZCP)	0
Radio Authentication	0
RF Site Configuration	
Virtual Prime Sites	2
RF Sites (include Simulcast sub-sites, ASR sites, HPD sites)	5
GTR 8000 Base Stations	30
Dispatch Site Configuration	
Dispatch Site Locations	0
MCC7500 Dispatch Consoles	0
MCC7100 Dispatch Consoles	0
AIS	1
CCGWs	7
MC EDGE Aux I/O	2
AXS Console Dispatch Site Locations	2
AXS Console PDH (Command Central Hub)	20
AXS Servers	1
Third Party Elements	
NICE 15 channel IP Radio Logger	1
Verint Logging recorders (IP, Telephony, or Analog) Purchased through MSI	0
MACH Alert FSA Purchased through MSI	0
Genesis Applications Purchased through MSI	0

10.11 Software Support Policy

SOFTWARE SUPPORT POLICY

This document defines specific support availability and timelines for Motorola Solutions ASTRO® 25 and Dimetra systems.

Support Periods: The standard support period begins when a system software release is first made available to the market. From that date, the standard support period for the software release is four years, referred to as Year 1 to Year 4 or Y1 to Y4. The extended support period is from year 5 to year 7 or Y5 to Y7. Depending on the support option, the End of Support (EoS) period is from either year 5 or year 8 and into the future. These support periods are not affected by the purchase date, shipment date or acceptance date of a system for a given software release.

1) Standard support period: Motorola Solutions will support the given software release in the following manner:

- **Support Service Availability**
  - Period: Y1 through Y4 from initial market availability of the software release
    - All Support Services available
- **Software Defect Repair / Patching**
  - Period: Y1 through Y2
    - Qualified Severity 1 and Severity 2 incidents that result in product defect fixes will be made available to the customer. Some defects may require an upgrade to a more current release to resolve.
  - Period: Y3 through Y4
    - Qualified Severity 1 incidents that result in product defect fixes will be made available to the customer. Some defects may require an upgrade to a more current release to resolve.
- **Security Services**
  - Period: Y1 through Y4
    - All Security Services available (Security Monitoring and Security Update Service)
- **System Expansion**
  - Period: Y1 through Y4
    - Full system expansion available including subscribers, sites, consoles, base stations and radio system Customer Enterprise Network (CEN) additions.

2) Extended Support Period: Applies to software releases that have reached the end of Standard Support. Motorola Solutions continues to provide support on such products as specified below. Extended Support includes:

- **Support Service Availability**
  - Period: Y5 through Y7
    - All Support Services available through pricing of these services will be escalated.
- **Software Defect Repair / Patching**
  - Period: Y5 through Y7
    - Defect Repair: Not available
- **Security Services**
  - Period: Y5 through Y7
    - Security Services - Not available
- **System Expansion**
  - Period: Y5 through Y7
    - Infrastructure expansions are not available. System Expansion is limited to subscribers only. Some features on the subscribers may not function due to Infrastructure expansions no longer being available.

3) End of Support Period: Applies to software releases that have reached the end of Extended Support. Support for older software versions will no longer be available. End of Support includes:

- **Support Service Availability and Pricing**
  - Period: Y8 and later
    - Support Services - Not Available
- **Software Patching**
  - Period: Y5 and later
    - Defect Repair - Not Available
    - Security Services - Not Available
- **System Expansion**
  - Period: Y5 and later
    - Infrastructure expansions are not available. System Expansion is limited to subscribers only. Some features on the subscribers may not function due to Infrastructure expansions no longer being available.

Motorola Solutions, Inc
Effective 11-21-2016

MOTOROLA SOLUTIONS

City of Fort Lauderdale

Attachment 11 - Project Timeline

RFP # 549

December 18, 2025

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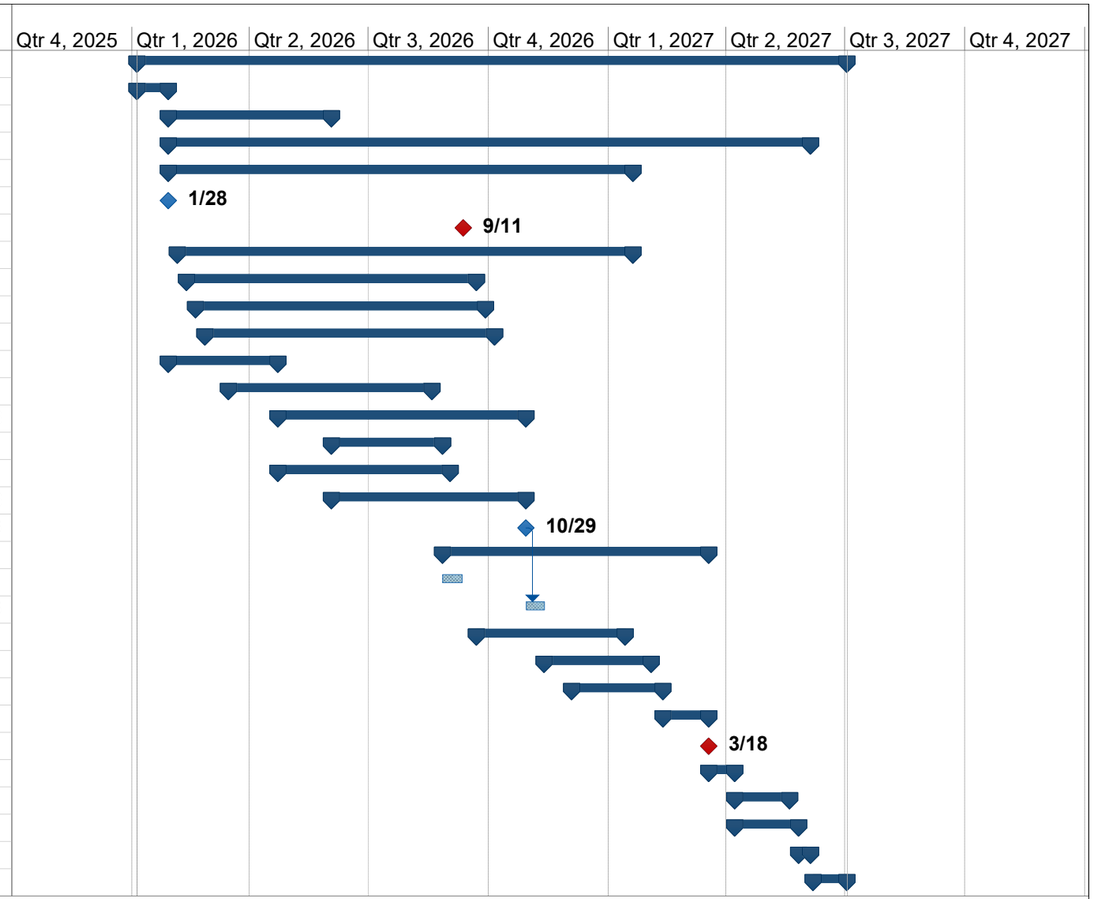
Section 1

RFP Section 3.1.8.3 Project Timeline Summary

A project timeline summary is provided on the following pages.

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ID	Task Name	% Complete	Duration	Start	Finish
1	**Ft Lauderdale**	**0%**	**379 d**	**Mon 1/5/26**	**Fri 7/2/27**
2	**Project Initiation**	**0%**	**17 d**	**Mon 1/5/26**	**Wed 1/28/26**
13	**Project Planning**	**0%**	**88 d**	**Thu 1/29/26**	**Tue 6/2/26**
77	**Project Execution**	**0%**	**342 d**	**Wed 1/28/26**	**Fri 6/4/27**
78	**Civil Work**	**0%**	**245 d**	**Wed 1/28/26**	**Tue 1/19/27**
79	Civil Site Final, NTP for Pre Construction	0%	0 d	Wed 1/28/26	Wed 1/28/26
80	CFE: State of Florida Tower Complete	0%	0 d	Fri 9/11/26	Fri 9/11/26
81	**State of Florida Tower: Civil Development, New Shelter**	**0%**	**240 d**	**Wed 2/4/26**	**Tue 1/19/27**
179	**Utilities Tower: Civil Development, Existing Tower and Shelter**	**0%**	**155 d**	**Wed 2/11/26**	**Mon 9/21/26**
214	**Playa del Sol: Civil Development, Existing Tower and Shelter**	**0%**	**155 d**	**Wed 2/18/26**	**Mon 9/28/26**
249	**Point of Americas: Civil Development, Existing Tower and Shelter**	**0%**	**155 d**	**Wed 2/25/26**	**Mon 10/5/26**
284	**MW Path Survey and Frequency Coordination**	**0%**	**60 d**	**Thu 1/29/26**	**Wed 4/22/26**
296	**LMR Frequency Coordination and LMR Applications**	**0%**	**110 d**	**Mon 3/16/26**	**Tue 8/18/26**
303	**Manufacturing and Staging**	**0%**	**133 d**	**Wed 4/22/26**	**Thu 10/29/26**
304	**DC Plants and Batteries**	**0%**	**60 d**	**Wed 6/3/26**	**Wed 8/26/26**
307	**MW Equipment Order, Manufacturing and Staging**	**0%**	**92 d**	**Wed 4/22/26**	**Tue 9/1/26**
314	**FNE Equipment Order, Manufacturing and Staging**	**0%**	**105 d**	**Tue 6/2/26**	**Thu 10/29/26**
327	Manufacturing and Staging Complete	0%	0 d	Thu 10/29/26	Thu 10/29/26
328	**System Installation**	**0%**	**139 d**	**Thu 8/27/26**	**Thu 3/18/27**
329	Receive and Inventory Non-Staged Equipment	0%	10 d	Thu 8/27/26	Thu 9/10/26
330	Received and Inventory Staged Equipment	0%	10 d	Fri 10/30/26	Thu 11/12/26
331	**DC Installation**	**0%**	**77 d**	**Mon 9/21/26**	**Wed 1/13/27**
384	**MW Installation**	**0%**	**52 d**	**Thu 11/12/26**	**Tue 2/2/27**
413	**LMR Equipment Installation**	**0%**	**46 d**	**Thu 12/3/26**	**Thu 2/11/27**
442	**Dispatch**	**0%**	**25 d**	**Fri 2/12/27**	**Thu 3/18/27**
453	System Installation Complete	0%	0 d	Thu 3/18/27	Thu 3/18/27
454	**Perform System Acceptance Testing**	**0%**	**14 d**	**Fri 3/19/27**	**Wed 4/7/27**
463	**System Coverage Acceptance Test (CATP)**	**0%**	**30 d**	**Wed 4/7/27**	**Wed 5/19/27**
469	**Training**	**0%**	**35 d**	**Thu 4/8/27**	**Wed 5/26/27**
476	**Cut-Over**	**0%**	**6 d**	**Thu 5/27/27**	**Fri 6/4/27**
479	**Project Close**	**0%**	**20 d**	**Mon 6/7/27**	**Fri 7/2/27**



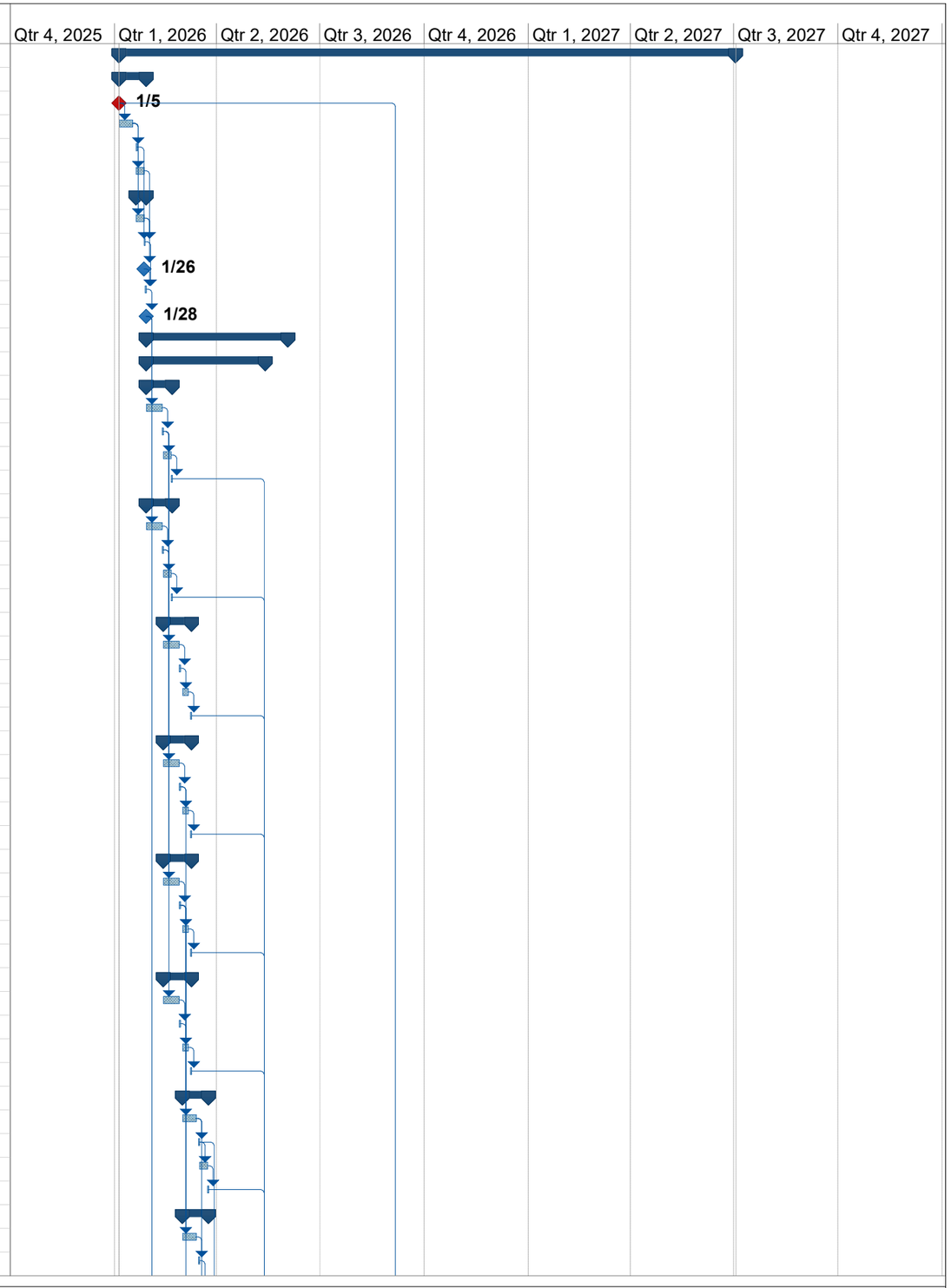
Section 2

RFP Section 3.1.8.3 Project Timeline Full

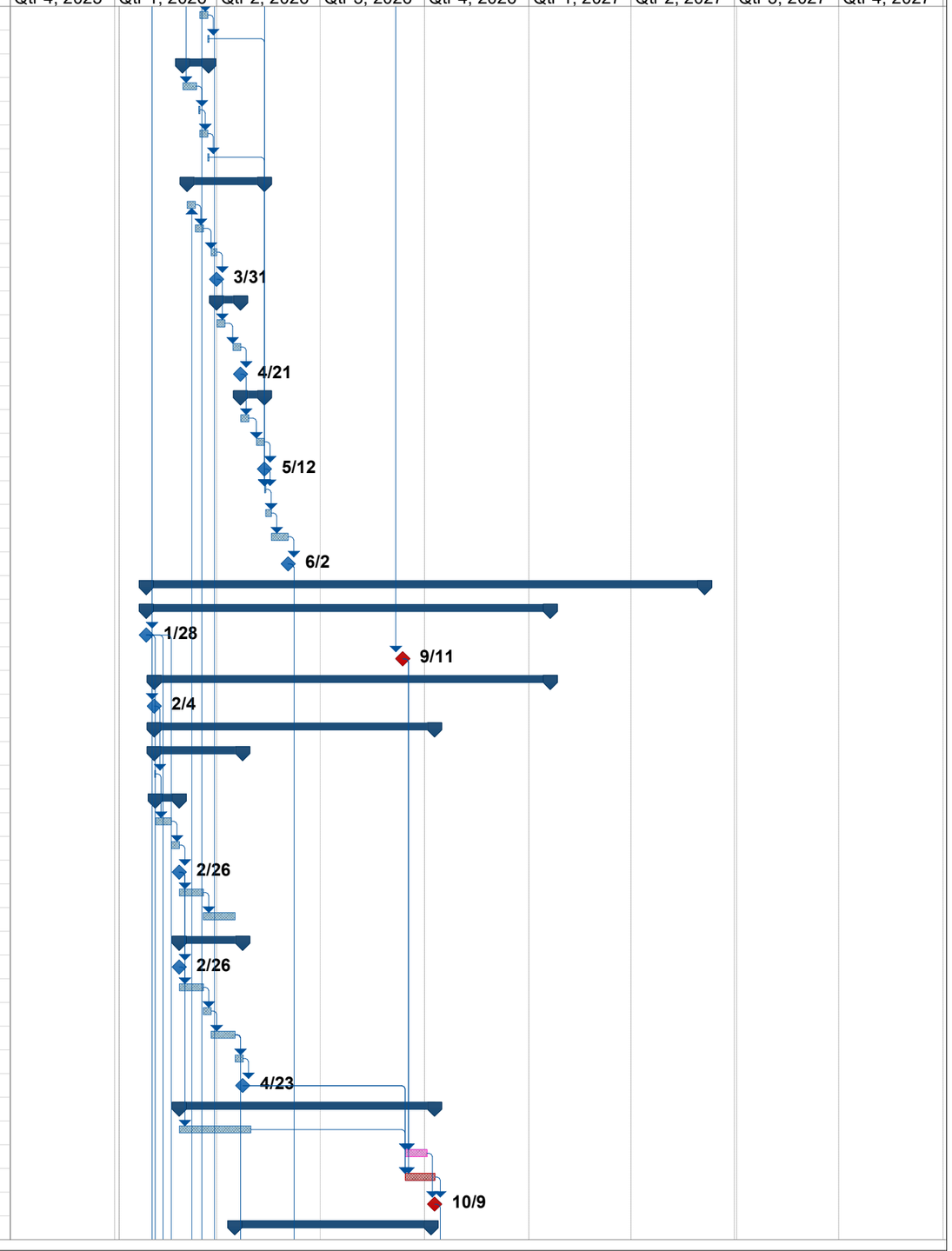
A full project timeline is provided on the following pages.

Use or disclosure of this proposal is subject to the restrictions on the cover page.
Motorola Solutions

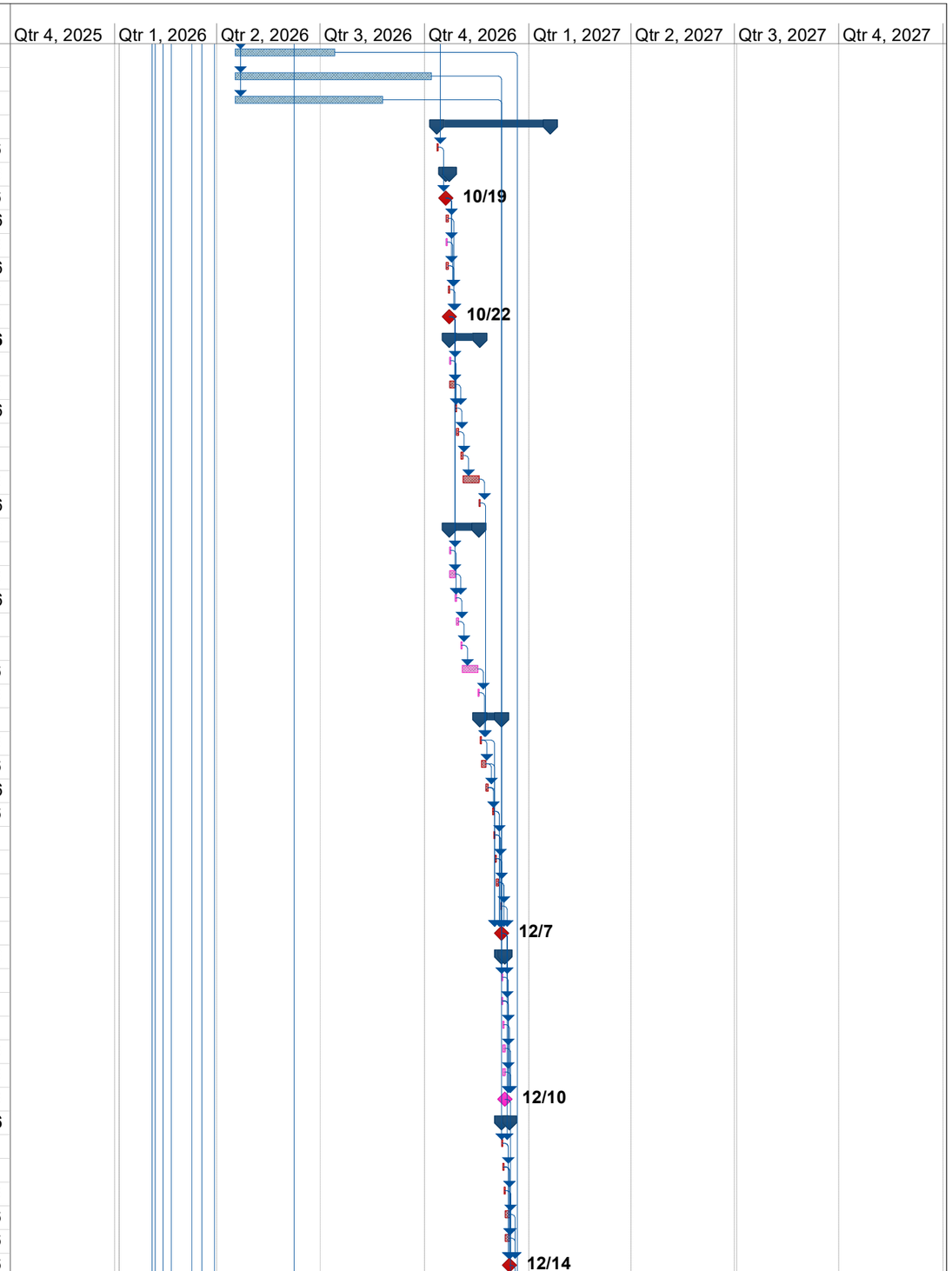
ID	Task Name	% Complete	Duration	Start	Finish
1	**Ft Lauderdale**	**0%**	**379 d**	**Mon 1/5/26**	**Fri 7/2/27**
2	**Project Initiation**	**0%**	**17 d**	**Mon 1/5/26**	**Wed 1/28/26**
3	Contract Award	0%	0 d	Mon 1/5/26	Mon 1/5/26
4	Project Set Up	0%	10 d	Mon 1/5/26	Fri 1/16/26
5	Post Sale Transition Meeting Completed	0%	1 d	Tue 1/20/26	Tue 1/20/26
6	Internal Project Plan/Design Review	0%	5 d	Tue 1/20/26	Mon 1/26/26
7	**Project Kick-off**	**0%**	**7 d**	**Tue 1/20/26**	**Wed 1/28/26**
8	Kick-off Preparation	0%	5 d	Tue 1/20/26	Mon 1/26/26
9	Internal Project Kick-off	0%	1 d	Tue 1/27/26	Tue 1/27/26
10	Project Reports and Recurring Deliverables Established	0%	0 d	Mon 1/26/26	Mon 1/26/26
11	Project Kick-off Conducted	0%	1 d	Wed 1/28/26	Wed 1/28/26
12	Project Initiation Complete	0%	0 d	Wed 1/28/26	Wed 1/28/26
13	**Project Planning**	**0%**	**88 d**	**Thu 1/29/26**	**Tue 6/2/26**
14	**LMR Customer Design Updated and Delivered**	**0%**	**75 d**	**Thu 1/29/26**	**Wed 5/13/26**
15	**System Architecture/Equipment Overview**	**0%**	**17 d**	**Thu 1/29/26**	**Fri 2/20/26**
16	System Architecture/Equipment Overview Finalized	0%	10 d	Thu 1/29/26	Wed 2/11/26
17	System Architecture/Equipment Overview Delivered	0%	1 d	Thu 2/12/26	Thu 2/12/26
18	System Architecture/Equipment Overview Comments Received	0%	5 d	Fri 2/13/26	Thu 2/19/26
19	System Architecture/Equipment Overview Final Delivered	0%	1 d	Fri 2/20/26	Fri 2/20/26
20	**System Description**	**0%**	**17 d**	**Thu 1/29/26**	**Fri 2/20/26**
21	System Description Updated	0%	10 d	Thu 1/29/26	Wed 2/11/26
22	System Description Delivered	0%	1 d	Thu 2/12/26	Thu 2/12/26
23	System Description Comments Received	0%	5 d	Fri 2/13/26	Thu 2/19/26
24	System Description Final Delivered	0%	1 d	Fri 2/20/26	Fri 2/20/26
25	**Dispatch Subsystems**	**0%**	**17 d**	**Fri 2/13/26**	**Mon 3/9/26**
26	Dispatch Subsystems Updated	0%	10 d	Fri 2/13/26	Thu 2/26/26
27	Dispatch Subsystems Draft Delivered	0%	1 d	Fri 2/27/26	Fri 2/27/26
28	Dispatch Subsystems Comments Received	0%	5 d	Mon 3/2/26	Fri 3/6/26
29	Dispatch Subsystems Final Delivered	0%	1 d	Mon 3/9/26	Mon 3/9/26
30	**Network Management System/Fault Management/Network Security**	**0%**	**17 d**	**Fri 2/13/26**	**Mon 3/9/26**
31	Network Management System/Fault Management/Network Security Design Up	0%	10 d	Fri 2/13/26	Thu 2/26/26
32	Network Management System/Fault Management/Network Security Draft Deliv	0%	1 d	Fri 2/27/26	Fri 2/27/26
33	Network Management System/Fault Management/Network Security Comments	0%	5 d	Mon 3/2/26	Fri 3/6/26
34	Network Management System/Fault Management/Network Security Final Deliv	0%	1 d	Mon 3/9/26	Mon 3/9/26
35	**Mobile Data Services/CEN Services**	**0%**	**17 d**	**Fri 2/13/26**	**Mon 3/9/26**
36	Mobile Data Services/CEN Services Updated	0%	10 d	Fri 2/13/26	Thu 2/26/26
37	Mobile Data Services/CEN Services Draft Delivered	0%	1 d	Fri 2/27/26	Fri 2/27/26
38	Mobile Data Services/CEN Services Comments Received	0%	5 d	Mon 3/2/26	Fri 3/6/26
39	Mobile Data Services/CEN Services Final Delivered	0%	1 d	Mon 3/9/26	Mon 3/9/26
40	**Training Plans**	**0%**	**17 d**	**Fri 2/13/26**	**Mon 3/9/26**
41	Training Plans Updated	0%	10 d	Fri 2/13/26	Thu 2/26/26
42	Training Plans Draft Delivered	0%	1 d	Fri 2/27/26	Fri 2/27/26
43	Training Plans Comments Received	0%	5 d	Mon 3/2/26	Fri 3/6/26
44	Training Plans Final Delivered	0%	1 d	Mon 3/9/26	Mon 3/9/26
45	**RF Coverage Design**	**0%**	**17 d**	**Mon 3/2/26**	**Tue 3/24/26**
46	RF Coverage Design Updated	0%	10 d	Mon 3/2/26	Fri 3/13/26
47	RF Coverage Design Draft Delivered	0%	1 d	Mon 3/16/26	Mon 3/16/26
48	RF Coverage Design Comments Received	0%	5 d	Tue 3/17/26	Mon 3/23/26
49	RF Coverage Design Final Delivered	0%	1 d	Tue 3/24/26	Tue 3/24/26
50	**Acceptance Test Plans**	**0%**	**17 d**	**Mon 3/2/26**	**Tue 3/24/26**
51	Acceptance Test Plans Finalized	0%	10 d	Mon 3/2/26	Fri 3/13/26
52	Acceptance Test Plans Draft Delivered	0%	1 d	Mon 3/16/26	Mon 3/16/26



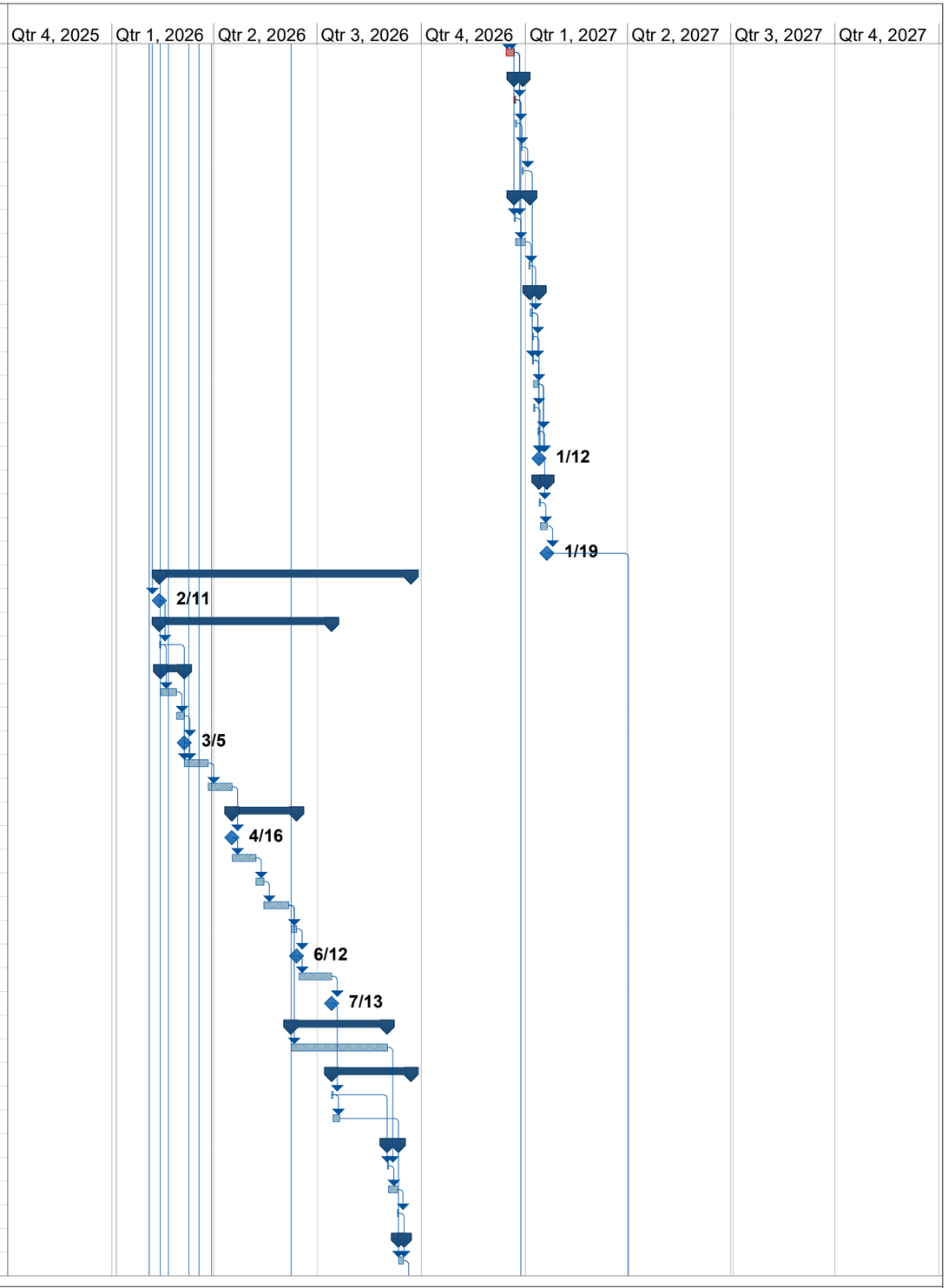
ID	Task Name	% Complete	Duration	Start	Finish
53	Acceptance Test Plans Comments Received	0%	5 d	Tue 3/17/26	Mon 3/23/26
54	Acceptance Test Plans Final Delivered	0%	1 d	Tue 3/24/26	Tue 3/24/26
55	**Preliminary Cutover / Transition Plan**	**0%**	**17 d**	**Mon 3/2/26**	**Tue 3/24/26**
56	Cutover Planning Developed	0%	10 d	Mon 3/2/26	Fri 3/13/26
57	Cutover Planning Draft Delivered	0%	1 d	Mon 3/16/26	Mon 3/16/26
58	Cutover Planning Comments Received	0%	5 d	Tue 3/17/26	Mon 3/23/26
59	Cutover Planning Final Delivered	0%	1 d	Tue 3/24/26	Tue 3/24/26
60	**MW Design Engineering**	**0%**	**48 d**	**Fri 3/6/26**	**Tue 5/12/26**
61	Generate & Release Equipment List	0%	5 d	Fri 3/6/26	Thu 3/12/26
62	Generate Rack Profiles, Wire List, Channel Plan, Block Diagrams and Shipping	0%	5 d	Fri 3/13/26	Thu 3/19/26
63	Customer Reviews Rack Profiles, Channel Plan and Shipping Checklist	0%	3 d	Fri 3/27/26	Tue 3/31/26
64	Customer Approves Rack Profiles, Channel Plan and Confirms Local Warehou	0%	0 d	Tue 3/31/26	Tue 3/31/26
65	**MW Factory Acceptance Testing (FAT) Procedure**	**0%**	**15 d**	**Wed 4/1/26**	**Tue 4/21/26**
66	Prepare and Issue FAT Procedure for approval	0%	5 d	Wed 4/1/26	Tue 4/7/26
67	Customer Reviews FAT Procedure	0%	5 d	Wed 4/15/26	Tue 4/21/26
68	Customer Approves FAT Procedure	0%	0 d	Tue 4/21/26	Tue 4/21/26
69	**MW Site Acceptance Testing (SAT) Procedure**	**0%**	**15 d**	**Wed 4/22/26**	**Tue 5/12/26**
70	Prepare and Issue SAT Procedure for approval	0%	5 d	Wed 4/22/26	Tue 4/28/26
71	Customer Reviews SAT Procedure	0%	5 d	Wed 5/6/26	Tue 5/12/26
72	Customer Approves SAT Procedure	0%	0 d	Tue 5/12/26	Tue 5/12/26
73	CDR Presentation Material Delivered	0%	1 d	Wed 5/13/26	Wed 5/13/26
74	Design Review Conducted	0%	3 d	Thu 5/14/26	Mon 5/18/26
75	Design Reviewed and Approved	0%	10 d	Tue 5/19/26	Tue 6/2/26
76	Project Planning Complete	0%	0 d	Tue 6/2/26	Tue 6/2/26
77	**Project Execution**	**0%**	**342 d**	**Wed 1/28/26**	**Fri 6/4/27**
78	**Civil Work**	**0%**	**245 d**	**Wed 1/28/26**	**Tue 1/19/27**
79	Civil Site Final, NTP for Pre Construction	0%	0 d	Wed 1/28/26	Wed 1/28/26
80	CFE: State of Florida Tower Complete	0%	0 d	Fri 9/11/26	Fri 9/11/26
81	**State of Florida Tower: Civil Development, New Shelter**	**0%**	**240 d**	**Wed 2/4/26**	**Tue 1/19/27**
82	SoF Tower: NTP from Customer	0%	0 d	Wed 2/4/26	Wed 2/4/26
83	**SoF Tower: Pre Construction**	**0%**	**174 d**	**Thu 2/5/26**	**Fri 10/9/26**
84	**SoF Tower: Site Design**	**0%**	**56 d**	**Thu 2/5/26**	**Thu 4/23/26**
85	SoF Tower: Site Visit with A&E	0%	1 d	Thu 2/5/26	Thu 2/5/26
86	**SoF Tower: Lease Exhibit Prepared and Delivered**	**0%**	**15 d**	**Fri 2/6/26**	**Thu 2/26/26**
87	SoF Tower: Lease Exhibit Prepared and Delivered	0%	10 d	Fri 2/6/26	Thu 2/19/26
88	SoF Tower: Lease Exhibit Reviewed by Customer	0%	5 d	Fri 2/20/26	Thu 2/26/26
89	SoF Tower: Lease Exhibit Approved	0%	0 d	Thu 2/26/26	Thu 2/26/26
90	SoF Tower: Geotechnical Testing and Report Completed	0%	15 d	Fri 2/27/26	Thu 3/19/26
91	SoF Tower: Shelter Design and Drawings Developed	0%	20 d	Fri 3/20/26	Thu 4/16/26
92	**SoF Tower: Site Drawings**	**0%**	**40 d**	**Thu 2/26/26**	**Thu 4/23/26**
93	SoF Tower: CD's Production Started	0%	0 d	Thu 2/26/26	Thu 2/26/26
94	SoF Tower: 60% CDs Received	0%	15 d	Fri 2/27/26	Thu 3/19/26
95	SoF Tower: 60% CDs Reviewed w/Customer	0%	5 d	Fri 3/20/26	Thu 3/26/26
96	SoF Tower: 90% CDs Received	0%	15 d	Fri 3/27/26	Thu 4/16/26
97	SoF Tower: 90% CDs Reviewed w/Customer	0%	5 d	Fri 4/17/26	Thu 4/23/26
98	SoF Tower: 100% CDs Approved by Customer	0%	0 d	Thu 4/23/26	Thu 4/23/26
99	**SoF Tower: Site Permits and Approvals**	**0%**	**158 d**	**Fri 2/27/26**	**Fri 10/9/26**
100	SoF Tower: Conduct NEPA/SEPA/SHPO Studies	0%	45 d	Fri 2/27/26	Thu 4/30/26
101	SoF Tower: Electrical Permit Application Approval	0%	15 d	Mon 9/14/26	Fri 10/2/26
102	SoF Tower: Building and Construction Permit Application and Approval	0%	20 d	Mon 9/14/26	Fri 10/9/26
103	SoF Tower: Construction NTP	0%	0 d	Fri 10/9/26	Fri 10/9/26
104	**SoF Tower: Site Material Acquisition**	**0%**	**120 d**	**Fri 4/17/26**	**Tue 10/6/26**



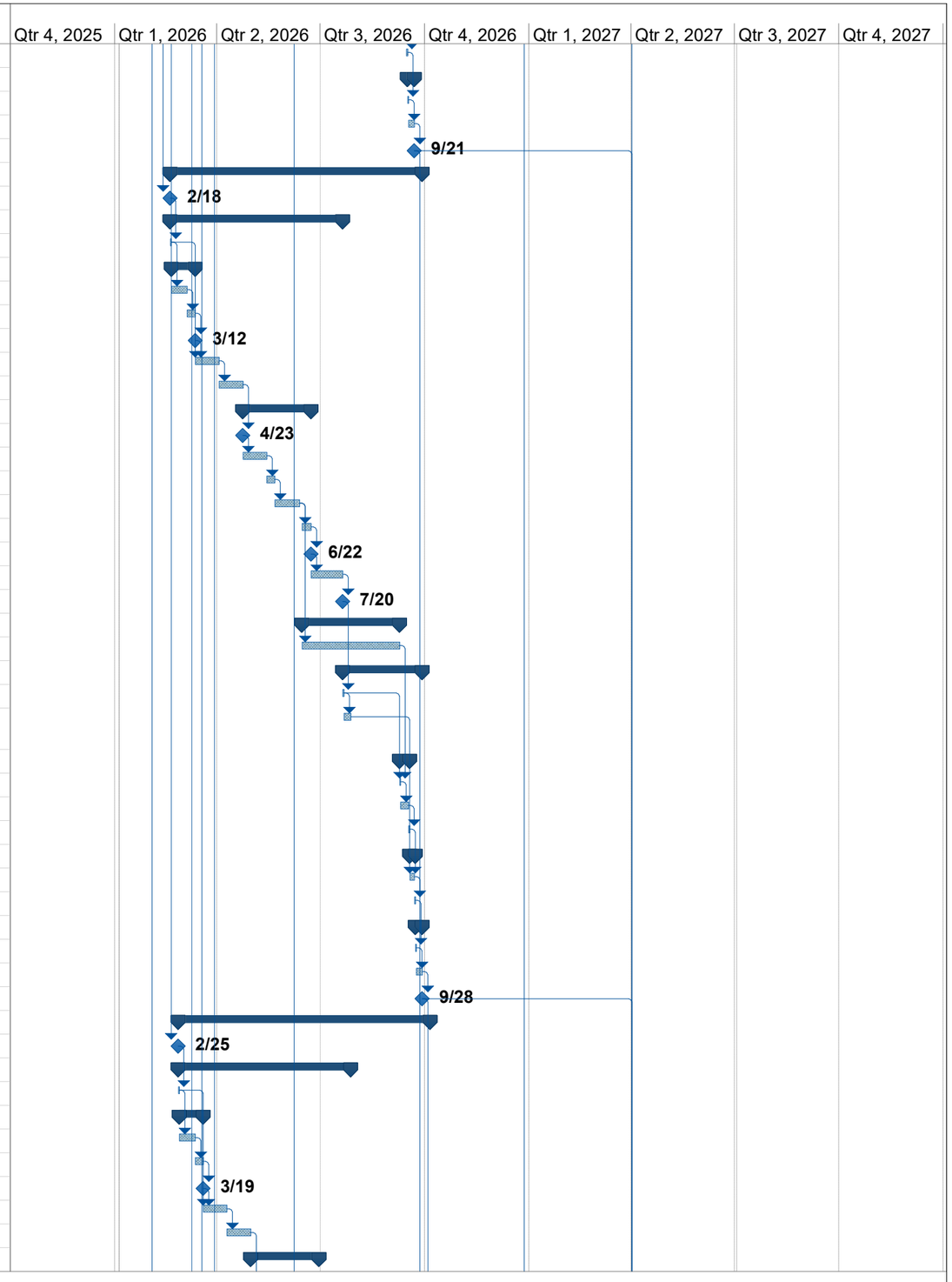
ID	Task Name	% Complete	Duration	Start	Finish
105	SoF Tower: Antenna and Line Manufacture and Lead Time	0%	60 d	Fri 4/17/26	Mon 7/13/26
106	SoF Tower: Shelter Manufacture and Lead Time	0%	120 d	Fri 4/17/26	Tue 10/6/26
107	SoF Tower: Generator Manufacture and Lead Time	0%	90 d	Fri 4/17/26	Mon 8/24/26
108	**SoF Tower: Construction**	**0%**	**66 d**	**Mon 10/12/26**	**Tue 1/19/27**
109	SoF Tower: Pre-Construction Meeting and Construction Staking	0%	1 d	Mon 10/12/26	Mon 10/12/26
110	**SoF Tower: Site Preparation**	**0%**	**3 d**	**Mon 10/19/26**	**Thu 10/22/26**
111	SoF Tower: Construction Start	0%	0 d	Mon 10/19/26	Mon 10/19/26
112	SoF Tower: Clearing/Grubbing of Site	0%	2 d	Tue 10/20/26	Wed 10/21/26
113	SoF Tower: Erosion Control	0%	1 d	Tue 10/20/26	Tue 10/20/26
114	SoF Tower: Rough Grading/Excavation/Compaction of Compound	0%	2 d	Tue 10/20/26	Wed 10/21/26
115	SoF Tower: Final Staking	0%	1 d	Thu 10/22/26	Thu 10/22/26
116	SoF Tower: Site Preparation Complete	0%	0 d	Thu 10/22/26	Thu 10/22/26
117	**SoF Tower: Equipment Shelter Foundation**	**0%**	**19 d**	**Fri 10/23/26**	**Wed 11/18/26**
118	SoF Tower: Equipment Shelter Rebar Delivery	0%	1 d	Fri 10/23/26	Fri 10/23/26
119	SoF Tower: Equipment Shelter Foundation Excavation	0%	3 d	Fri 10/23/26	Tue 10/27/26
120	SoF Tower: Equipment Shelter Foundation Excavation Inspection	0%	1 d	Wed 10/28/26	Wed 10/28/26
121	SoF Tower: Equipment Shelter Form and Rebar Installation	0%	2 d	Thu 10/29/26	Fri 10/30/26
122	SoF Tower: Equipment Shelter Foundation Form/Rebar Inspection	0%	2 d	Mon 11/2/26	Tue 11/3/26
123	SoF Tower: Equipment Shelter Foundation Concrete Pour and Cure	0%	10 d	Wed 11/4/26	Tue 11/17/26
124	SoF Tower: Equipment Shelter Foundation Inspection	0%	1 d	Wed 11/18/26	Wed 11/18/26
125	**SoF Tower: Generator Shelter Foundation**	**0%**	**18 d**	**Fri 10/23/26**	**Tue 11/17/26**
126	SoF Tower: Generator Shelter Rebar Delivery	0%	1 d	Fri 10/23/26	Fri 10/23/26
127	SoF Tower: Generator Shelter Foundation Excavation	0%	3 d	Fri 10/23/26	Tue 10/27/26
128	SoF Tower: Generator Shelter Foundation Excavation Inspection	0%	1 d	Wed 10/28/26	Wed 10/28/26
129	SoF Tower: Generator Shelter Form and Rebar Installation	0%	2 d	Thu 10/29/26	Fri 10/30/26
130	SoF Tower: Generator Shelter Foundation Form/Rebar Inspection	0%	1 d	Mon 11/2/26	Mon 11/2/26
131	SoF Tower: Generator Shelter Foundation Concrete Pour and Cure	0%	10 d	Tue 11/3/26	Mon 11/16/26
132	SoF Tower: Generator Shelter Foundation Inspection	0%	1 d	Tue 11/17/26	Tue 11/17/26
133	**SoF Tower: Electrical Preparation**	**0%**	**11 d**	**Thu 11/19/26**	**Mon 12/7/26**
134	SoF Tower: H-Frame Installation	0%	1 d	Thu 11/19/26	Thu 11/19/26
135	SoF Tower: Trenching for Underground Electrical Service	0%	2 d	Fri 11/20/26	Mon 11/23/26
136	SoF Tower: Electrical Conduit Installation	0%	2 d	Tue 11/24/26	Wed 11/25/26
137	SoF Tower: Electrical Conduit Inspection	0%	1 d	Mon 11/30/26	Mon 11/30/26
138	SoF Tower: Backfill Service Trench	0%	1 d	Tue 12/1/26	Tue 12/1/26
139	SoF Tower: Power stub up/wire Installation	0%	1 d	Wed 12/2/26	Wed 12/2/26
140	SoF Tower: Install Ground Ring	0%	2 d	Thu 12/3/26	Fri 12/4/26
141	SoF Tower: Ground Field Inspection	0%	1 d	Mon 12/7/26	Mon 12/7/26
142	SoF Tower: Electrical Preparation Complete	0%	0 d	Mon 12/7/26	Mon 12/7/26
143	**SoF Tower: Equipment Shelter Installation**	**0%**	**3 d**	**Tue 12/8/26**	**Thu 12/10/26**
144	SoF Tower: Equipment Shelter Delivered to Site	0%	1 d	Tue 12/8/26	Tue 12/8/26
145	SoF Tower: Offload and Set/Install Shelter	0%	1 d	Tue 12/8/26	Tue 12/8/26
146	SoF Tower: Building Inspection	0%	1 d	Wed 12/9/26	Wed 12/9/26
147	SoF Tower: Equipment Shelter Grounding	0%	2 d	Wed 12/9/26	Thu 12/10/26
148	SoF Tower: Backfill and Compact	0%	2 d	Wed 12/9/26	Thu 12/10/26
149	SoF Tower: Equipment Shelter Complete	0%	0 d	Thu 12/10/26	Thu 12/10/26
150	**SoF Tower: Generator Shelter Installation**	**0%**	**5 d**	**Tue 12/8/26**	**Mon 12/14/26**
151	SoF Tower: Generator Shelter Delivered to Site	0%	1 d	Tue 12/8/26	Tue 12/8/26
152	SoF Tower: Offload and Set/Install Shelter	0%	1 d	Wed 12/9/26	Wed 12/9/26
153	SoF Tower: Building Inspection	0%	1 d	Thu 12/10/26	Thu 12/10/26
154	SoF Tower: Generator Shelter Grounding	0%	2 d	Fri 12/11/26	Mon 12/14/26
155	SoF Tower: Backfill and Compact	0%	2 d	Fri 12/11/26	Mon 12/14/26
156	SoF Tower: Generator Shelter Complete	0%	0 d	Mon 12/14/26	Mon 12/14/26



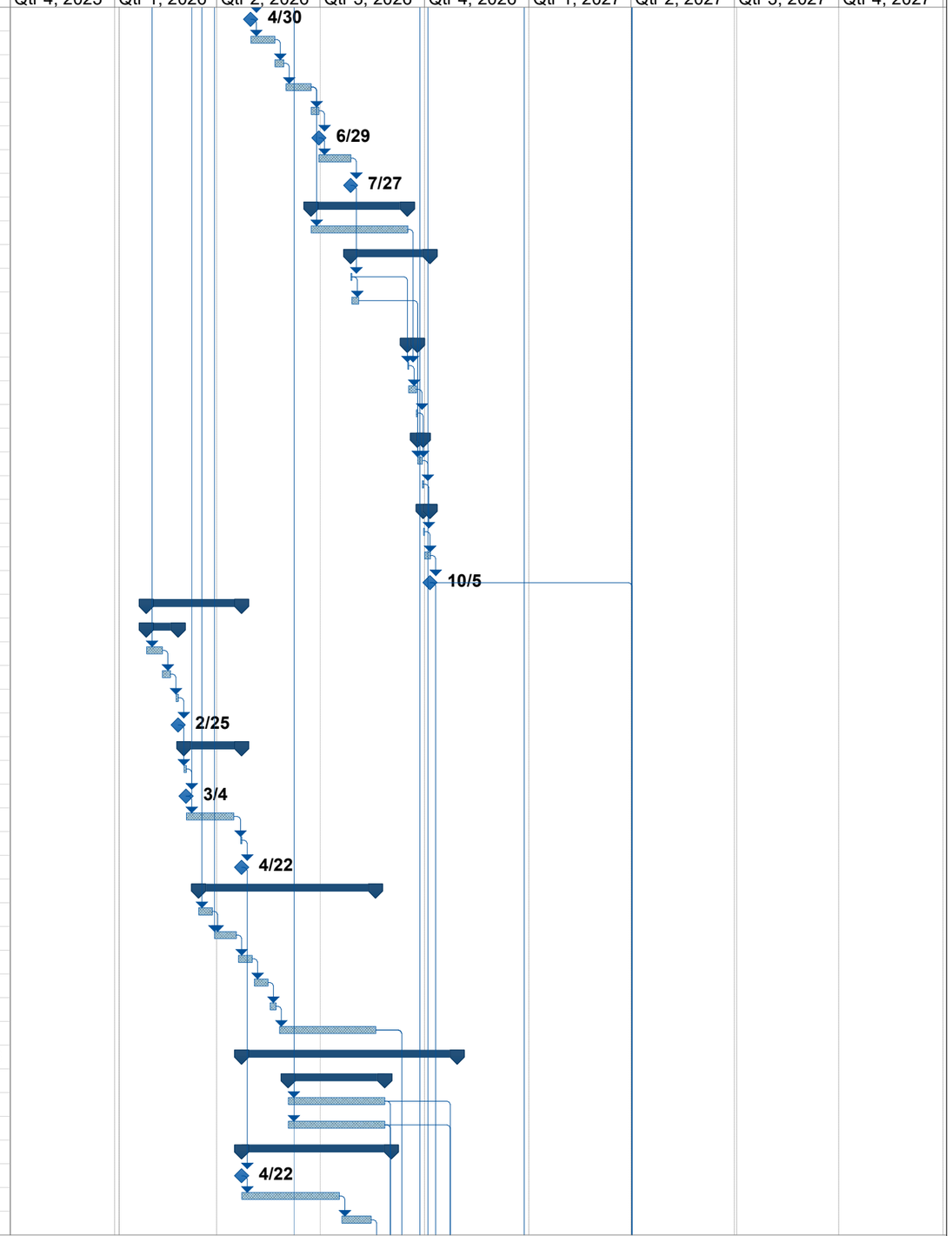
ID	Task Name	% Complete	Duration	Start	Finish
157	SoF Tower: Final Power and Connections to Equipment Shelter & Generatc	0%	5 d	Tue 12/15/26	Mon 12/21/26
158	**SoF Tower: Start-Up and Testing**	**0%**	**4 d**	**Tue 12/22/26**	**Tue 12/29/26**
159	SoF Tower: Provide Permanent Power to Site	0%	1 d	Tue 12/22/26	Tue 12/22/26
160	SoF Tower: Generator Start-Up/Test Shelter Power System	0%	1 d	Wed 12/23/26	Wed 12/23/26
161	SoF Tower: Start-Up Test ATS/UPS	0%	1 d	Mon 12/28/26	Mon 12/28/26
162	SoF Tower: Ground Testing and Inspection	0%	1 d	Tue 12/29/26	Tue 12/29/26
163	**SoF Tower: Antenna and Lines**	**0%**	**7 d**	**Tue 12/22/26**	**Mon 1/4/27**
164	SoF Tower: Ship Antennas, Lines and Accessories to the Site	0%	1 d	Tue 12/22/26	Tue 12/22/26
165	SoF Tower: RF Antennas and Lines Installation	0%	5 d	Wed 12/23/26	Thu 12/31/26
166	SoF Tower: RF Antenna Sweep Test Completed	0%	1 d	Mon 1/4/27	Mon 1/4/27
167	**SoF Tower: Site Restoration**	**0%**	**6 d**	**Tue 1/5/27**	**Tue 1/12/27**
168	SoF Tower: Compound Fence and Gate Installation	0%	2 d	Tue 1/5/27	Wed 1/6/27
169	SoF Tower: Compound Fence Grounding	0%	1 d	Thu 1/7/27	Thu 1/7/27
170	SoF Tower: Final Ground Connections	0%	1 d	Thu 1/7/27	Thu 1/7/27
171	SoF Tower: Final Grade and Stone Compound and Access Road	0%	2 d	Fri 1/8/27	Mon 1/11/27
172	SoF Tower: Provide final grading of disturbed areas around compound	0%	1 d	Fri 1/8/27	Fri 1/8/27
173	SoF Tower: Final Restoration and Touch Up	0%	1 d	Tue 1/12/27	Tue 1/12/27
174	SoF Tower: Restoration Complete	0%	0 d	Tue 1/12/27	Tue 1/12/27
175	**SoF Tower: Close-Out**	**0%**	**4 d**	**Wed 1/13/27**	**Tue 1/19/27**
176	SoF Tower: Punch List Walk	0%	1 d	Wed 1/13/27	Wed 1/13/27
177	SoF Tower: Punch List Completion	0%	3 d	Thu 1/14/27	Tue 1/19/27
178	SoF Tower: New Equipment Shelter and Generator Shelter Civil Complete	0%	0 d	Tue 1/19/27	Tue 1/19/27
179	**Utilities Tower: Civil Development, Existing Tower and Shelter**	**0%**	**155 d**	**Wed 2/11/26**	**Mon 9/21/26**
180	Utilities Tower: NTP from Customer	0%	0 d	Wed 2/11/26	Wed 2/11/26
181	**Utilities Tower: Pre Construction**	**0%**	**106 d**	**Thu 2/12/26**	**Mon 7/13/26**
182	Utilities Tower: Site Visit with A&E	0%	1 d	Thu 2/12/26	Thu 2/12/26
183	**Utilities Tower: Lease Exhibit Prepared and Delivered**	**0%**	**15 d**	**Fri 2/13/26**	**Thu 3/5/26**
184	Utilities Tower: Lease Exhibit Prepared and Delivered	0%	10 d	Fri 2/13/26	Thu 2/26/26
185	Utilities Tower: Lease Exhibit Reviewed by Customer	0%	5 d	Fri 2/27/26	Thu 3/5/26
186	Utilities Tower: Lease Exhibit Approved	0%	0 d	Thu 3/5/26	Thu 3/5/26
187	Utilities Tower: Tower Mapping Conducted	0%	15 d	Fri 3/6/26	Thu 3/26/26
188	Utilities Tower: Antenna Structural Analysis Conducted	0%	15 d	Fri 3/27/26	Thu 4/16/26
189	**Utilities Tower: Site Drawings**	**0%**	**40 d**	**Thu 4/16/26**	**Fri 6/12/26**
190	Utilities Tower: CD's Production Started	0%	0 d	Thu 4/16/26	Thu 4/16/26
191	Utilities Tower: 60% CDs Received	0%	15 d	Fri 4/17/26	Thu 5/7/26
192	Utilities Tower: 60% CDs Reviewed w/Customer	0%	5 d	Fri 5/8/26	Thu 5/14/26
193	Utilities Tower: 90% CDs Received	0%	15 d	Fri 5/15/26	Fri 6/5/26
194	Utilities Tower: 90% CDs Reviewed w/Customer	0%	5 d	Mon 6/8/26	Fri 6/12/26
195	Utilities Tower: 100% CDs Approved by Customer	0%	0 d	Fri 6/12/26	Fri 6/12/26
196	Utilities Tower: Permit Application and Approval	0%	20 d	Mon 6/15/26	Mon 7/13/26
197	Utilities Tower: Construction NTP	0%	0 d	Mon 7/13/26	Mon 7/13/26
198	**Utilities Tower: Site Material Acquisition**	**0%**	**60 d**	**Mon 6/8/26**	**Mon 8/31/26**
199	Utilities Tower: Antenna and Line Manufacture and Lead Time	0%	60 d	Mon 6/8/26	Mon 8/31/26
200	**Utilities Tower: Site Construction**	**0%**	**49 d**	**Tue 7/14/26**	**Mon 9/21/26**
201	Utilities Tower: Pre-Construction Meeting / Kick-off	0%	1 d	Tue 7/14/26	Tue 7/14/26
202	Utilities Tower: R56 and Electrical Distribution activities (as required and defi	0%	4 d	Wed 7/15/26	Mon 7/20/26
203	**Utilities Tower: Antenna and Lines**	**0%**	**7 d**	**Tue 9/1/26**	**Thu 9/10/26**
204	Utilities Tower: Ship Antennas, Lines and Accessories to the Site	0%	1 d	Tue 9/1/26	Tue 9/1/26
205	Utilities Tower: RF Antennas and Lines Installation	0%	5 d	Wed 9/2/26	Wed 9/9/26
206	Utilities Tower: RF Antenna Sweep Test Completed	0%	1 d	Thu 9/10/26	Thu 9/10/26
207	**Utilities Tower: Site Restoration**	**0%**	**3 d**	**Fri 9/11/26**	**Tue 9/15/26**
208	Utilities Tower: Restoration	0%	2 d	Fri 9/11/26	Mon 9/14/26



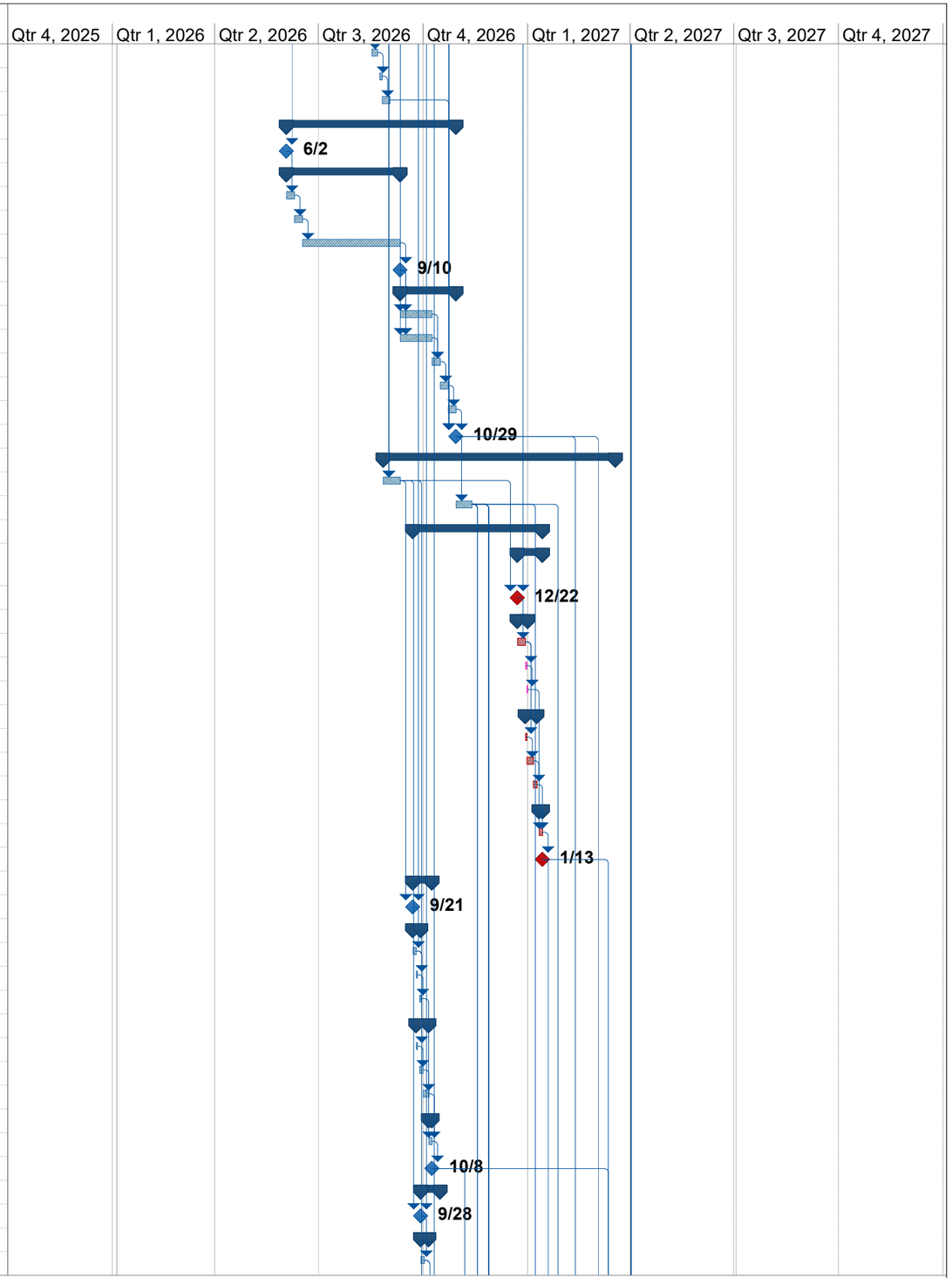
ID	Task Name	% Complete	Duration	Start	Finish
209	Utilities Tower: Final Restoration and Touch Up	0%	1 d	Tue 9/15/26	Tue 9/15/26
210	**Utilities Tower: Close-Out**	**0%**	**4 d**	**Wed 9/16/26**	**Mon 9/21/26**
211	Utilities Tower: Punch List Walk	0%	1 d	Wed 9/16/26	Wed 9/16/26
212	Utilities Tower: Punch List Completion	0%	3 d	Thu 9/17/26	Mon 9/21/26
213	Utilities Tower: Existing Site Improvement Complete	0%	0 d	Mon 9/21/26	Mon 9/21/26
214	**Playa del Sol: Civil Development, Existing Tower and Shelter**	**0%**	**155 d**	**Wed 2/18/26**	**Mon 9/28/26**
215	Playa del Sol: NTP from Customer	0%	0 d	Wed 2/18/26	Wed 2/18/26
216	**Playa del Sol: Pre Construction**	**0%**	**106 d**	**Thu 2/19/26**	**Mon 7/20/26**
217	Playa del Sol: Site Visit with A&E	0%	1 d	Thu 2/19/26	Thu 2/19/26
218	**Playa del Sol: Lease Exhibit Prepared and Delivered**	**0%**	**15 d**	**Fri 2/20/26**	**Thu 3/12/26**
219	Playa del Sol: Lease Exhibit Prepared and Delivered	0%	10 d	Fri 2/20/26	Thu 3/5/26
220	Playa del Sol: Lease Exhibit Reviewed by Customer	0%	5 d	Fri 3/6/26	Thu 3/12/26
221	Playa del Sol: Lease Exhibit Approved	0%	0 d	Thu 3/12/26	Thu 3/12/26
222	Playa del Sol: Tower Mapping Conducted	0%	15 d	Fri 3/13/26	Thu 4/2/26
223	Playa del Sol: Antenna Structural Analysis Conducted	0%	15 d	Fri 4/3/26	Thu 4/23/26
224	**Playa del Sol: Site Drawings**	**0%**	**40 d**	**Thu 4/23/26**	**Mon 6/22/26**
225	Playa del Sol: CD's Production Started	0%	0 d	Thu 4/23/26	Thu 4/23/26
226	Playa del Sol: 60% CDs Received	0%	15 d	Fri 4/24/26	Thu 5/14/26
227	Playa del Sol: 60% CDs Reviewed w/Customer	0%	5 d	Fri 5/15/26	Thu 5/21/26
228	Playa del Sol: 90% CDs Received	0%	15 d	Fri 5/22/26	Fri 6/12/26
229	Playa del Sol: 90% CDs Reviewed w/Customer	0%	5 d	Mon 6/15/26	Mon 6/22/26
230	Playa del Sol: 100% CDs Approved by Customer	0%	0 d	Mon 6/22/26	Mon 6/22/26
231	Playa del Sol: Permit Application and Approval	0%	20 d	Tue 6/23/26	Mon 7/20/26
232	Playa del Sol: Construction NTP	0%	0 d	Mon 7/20/26	Mon 7/20/26
233	**Playa del Sol: Site Material Acquisition**	**0%**	**60 d**	**Mon 6/15/26**	**Tue 9/8/26**
234	Playa del Sol: Antenna and Line Manufacture and Lead Time	0%	60 d	Mon 6/15/26	Tue 9/8/26
235	**Playa del Sol: Site Construction**	**0%**	**49 d**	**Tue 7/21/26**	**Mon 9/28/26**
236	Playa del Sol: Pre-Construction Meeting / Kick-off	0%	1 d	Tue 7/21/26	Tue 7/21/26
237	Playa del Sol: R56 and Electrical Distribution activities (as required and defined in Design)	0%	4 d	Wed 7/22/26	Mon 7/27/26
238	**Playa del Sol: Antenna and Lines**	**0%**	**7 d**	**Wed 9/9/26**	**Thu 9/17/26**
239	Playa del Sol: Ship Antennas, Lines and Accessories to the Site	0%	1 d	Wed 9/9/26	Wed 9/9/26
240	Playa del Sol: RF Antennas and Lines Installation	0%	5 d	Thu 9/10/26	Wed 9/16/26
241	Playa del Sol: RF Antenna Sweep Test Completed	0%	1 d	Thu 9/17/26	Thu 9/17/26
242	**Playa del Sol: Site Restoration**	**0%**	**3 d**	**Fri 9/18/26**	**Tue 9/22/26**
243	Playa del Sol: Restoration	0%	2 d	Fri 9/18/26	Mon 9/21/26
244	Playa del Sol: Final Restoration and Touch Up	0%	1 d	Tue 9/22/26	Tue 9/22/26
245	**Playa del Sol: Close-Out**	**0%**	**4 d**	**Wed 9/23/26**	**Mon 9/28/26**
246	Playa del Sol: Punch List Walk	0%	1 d	Wed 9/23/26	Wed 9/23/26
247	Playa del Sol: Punch List Completion	0%	3 d	Thu 9/24/26	Mon 9/28/26
248	Playa del Sol: Existing Site Improvement Complete	0%	0 d	Mon 9/28/26	Mon 9/28/26
249	**Point of Americas: Civil Development, Existing Tower and Shelter**	**0%**	**155 d**	**Wed 2/25/26**	**Mon 10/5/26**
250	Point of Americas: NTP from Customer	0%	0 d	Wed 2/25/26	Wed 2/25/26
251	**Point of Americas: Pre Construction**	**0%**	**106 d**	**Thu 2/26/26**	**Mon 7/27/26**
252	Point of Americas: Site Visit with A&E	0%	1 d	Thu 2/26/26	Thu 2/26/26
253	**Point of Americas: Lease Exhibit Prepared and Delivered**	**0%**	**15 d**	**Fri 2/27/26**	**Thu 3/19/26**
254	Point of Americas: Lease Exhibit Prepared and Delivered	0%	10 d	Fri 2/27/26	Thu 3/12/26
255	Point of Americas: Lease Exhibit Reviewed by Customer	0%	5 d	Fri 3/13/26	Thu 3/19/26
256	Point of Americas: Lease Exhibit Approved	0%	0 d	Thu 3/19/26	Thu 3/19/26
257	Point of Americas: Tower Mapping Conducted	0%	15 d	Fri 3/20/26	Thu 4/9/26
258	Point of Americas: Antenna Structural Analysis Conducted	0%	15 d	Fri 4/10/26	Thu 4/30/26
259	**Point of Americas: Site Drawings**	**0%**	**40 d**	**Thu 4/30/26**	**Mon 6/29/26**



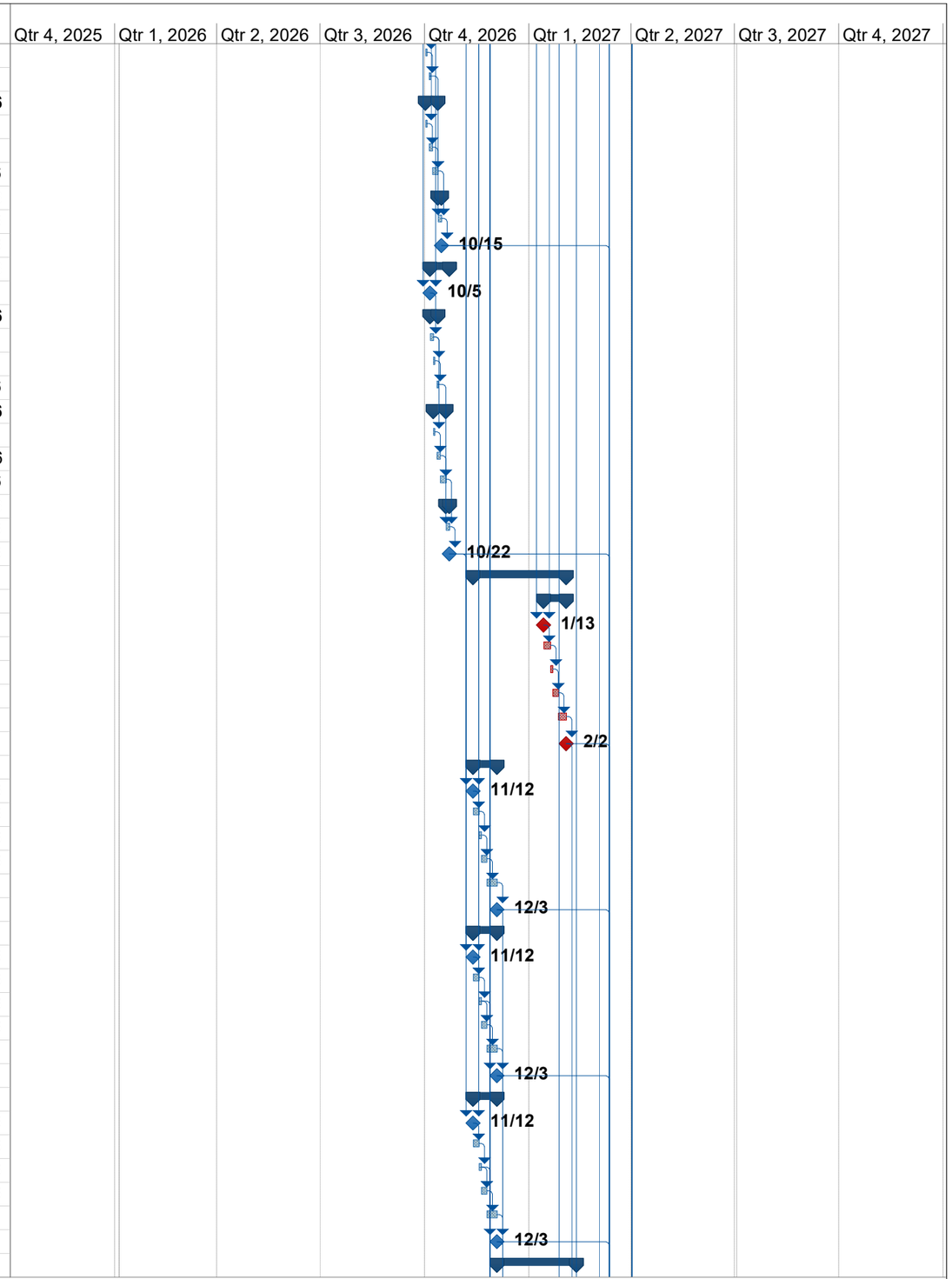
ID	Task Name	% Complete	Duration	Start	Finish
260	Point of Americas: CD's Production Started	0%	0 d	Thu 4/30/26	Thu 4/30/26
261	Point of Americas: 60% CDs Received	0%	15 d	Fri 5/1/26	Thu 5/21/26
262	Point of Americas: 60% CDs Reviewed w/Customer	0%	5 d	Fri 5/22/26	Fri 5/29/26
263	Point of Americas: 90% CDs Received	0%	15 d	Mon 6/1/26	Mon 6/22/26
264	Point of Americas: 90% CDs Reviewed w/Customer	0%	5 d	Tue 6/23/26	Mon 6/29/26
265	Point of Americas: 100% CDs Approved by Customer	0%	0 d	Mon 6/29/26	Mon 6/29/26
266	Point of Americas: Permit Application and Approval	0%	20 d	Tue 6/30/26	Mon 7/27/26
267	Point of Americas: Construction NTP	0%	0 d	Mon 7/27/26	Mon 7/27/26
268	**Point of Americas: Site Material Acquisition**	**0%**	**60 d**	**Tue 6/23/26**	**Tue 9/15/26**
269	Point of Americas: Antenna and Line Manufacture and Lead Time	0%	60 d	Tue 6/23/26	Tue 9/15/26
270	**Point of Americas: Site Construction**	**0%**	**49 d**	**Tue 7/28/26**	**Mon 10/5/26**
271	Point of Americas: Pre-Construction Meeting / Kick-off	0%	1 d	Tue 7/28/26	Tue 7/28/26
272	Point of Americas: R56 and Electrical Distribution activities (as required and defined in Design)	0%	4 d	Wed 7/29/26	Mon 8/3/26
273	**Point of Americas: Antenna and Lines**	**0%**	**7 d**	**Wed 9/16/26**	**Thu 9/24/26**
274	Point of Americas: Ship Antennas, Lines and Accessories to the Site	0%	1 d	Wed 9/16/26	Wed 9/16/26
275	Point of Americas: RF Antennas and Lines Installation	0%	5 d	Thu 9/17/26	Wed 9/23/26
276	Point of Americas: RF Antenna Sweep Test Completed	0%	1 d	Thu 9/24/26	Thu 9/24/26
277	**Point of Americas: Site Restoration**	**0%**	**3 d**	**Fri 9/25/26**	**Tue 9/29/26**
278	Point of Americas: Restoration	0%	2 d	Fri 9/25/26	Mon 9/28/26
279	Point of Americas: Final Restoration and Touch Up	0%	1 d	Tue 9/29/26	Tue 9/29/26
280	**Point of Americas: Close-Out**	**0%**	**4 d**	**Wed 9/30/26**	**Mon 10/5/26**
281	Point of Americas: Punch List Walk	0%	1 d	Wed 9/30/26	Wed 9/30/26
282	Point of Americas: Punch List Completion	0%	3 d	Thu 10/1/26	Mon 10/5/26
283	Point of Americas: Existing Site Improvement Complete	0%	0 d	Mon 10/5/26	Mon 10/5/26
284	**MW Path Survey and Frequency Coordination**	**0%**	**60 d**	**Thu 1/29/26**	**Wed 4/22/26**
285	**MW Path Survey**	**0%**	**20 d**	**Thu 1/29/26**	**Wed 2/25/26**
286	Field Path Survey	0%	10 d	Thu 1/29/26	Wed 2/11/26
287	Prepare Survey Report	0%	5 d	Thu 2/12/26	Wed 2/18/26
288	Customer Reviews Survey Report	0%	2 d	Tue 2/24/26	Wed 2/25/26
289	Customer Approves Survey Report	0%	0 d	Wed 2/25/26	Wed 2/25/26
290	**MW Frequency Coordination and Licensing**	**0%**	**37 d**	**Tue 3/3/26**	**Wed 4/22/26**
291	Client Authorization Notice (CAN)	0%	2 d	Tue 3/3/26	Wed 3/4/26
292	Customer Reviews and Approve CAN	0%	0 d	Wed 3/4/26	Wed 3/4/26
293	Prior Coordination Notice (PCN)	0%	30 d	Thu 3/5/26	Wed 4/15/26
294	Supplemental Showing	0%	1 d	Wed 4/22/26	Wed 4/22/26
295	FCC Application Filed	0%	0 d	Wed 4/22/26	Wed 4/22/26
296	**LMR Frequency Coordination and LMR Applications**	**0%**	**110 d**	**Mon 3/16/26**	**Tue 8/18/26**
297	CFI: Necessary Waivers/Letter of Concurrence for Frequency Coordination	0%	10 d	Mon 3/16/26	Fri 3/27/26
298	Frequency Search	0%	15 d	Mon 3/30/26	Fri 4/17/26
299	Verify LMR Frequencies	0%	10 d	Mon 4/20/26	Fri 5/1/26
300	Prepare LMR FCC 601 Applications	0%	10 d	Mon 5/4/26	Fri 5/15/26
301	Applications Submitted to APCO for Coordination	0%	5 d	Mon 5/18/26	Fri 5/22/26
302	FCC Review and Granting of Applications	0%	60 d	Tue 5/26/26	Tue 8/18/26
303	**Manufacturing and Staging**	**0%**	**133 d**	**Wed 4/22/26**	**Thu 10/29/26**
304	**DC Plants and Batteries**	**0%**	**60 d**	**Wed 6/3/26**	**Wed 8/26/26**
305	DC Batteries: Order, and Manufacture	0%	60 d	Wed 6/3/26	Wed 8/26/26
306	DC Batteries: Ship to Field	0%	60 d	Wed 6/3/26	Wed 8/26/26
307	**MW Equipment Order, Manufacturing and Staging**	**0%**	**92 d**	**Wed 4/22/26**	**Tue 9/1/26**
308	MW Notice to proceed	0%	0 d	Wed 4/22/26	Wed 4/22/26
309	MW Equipment Ordering and Manufacturing	0%	60 d	Thu 4/23/26	Fri 7/17/26
310	MW System Build	0%	20 d	Mon 7/20/26	Fri 8/14/26



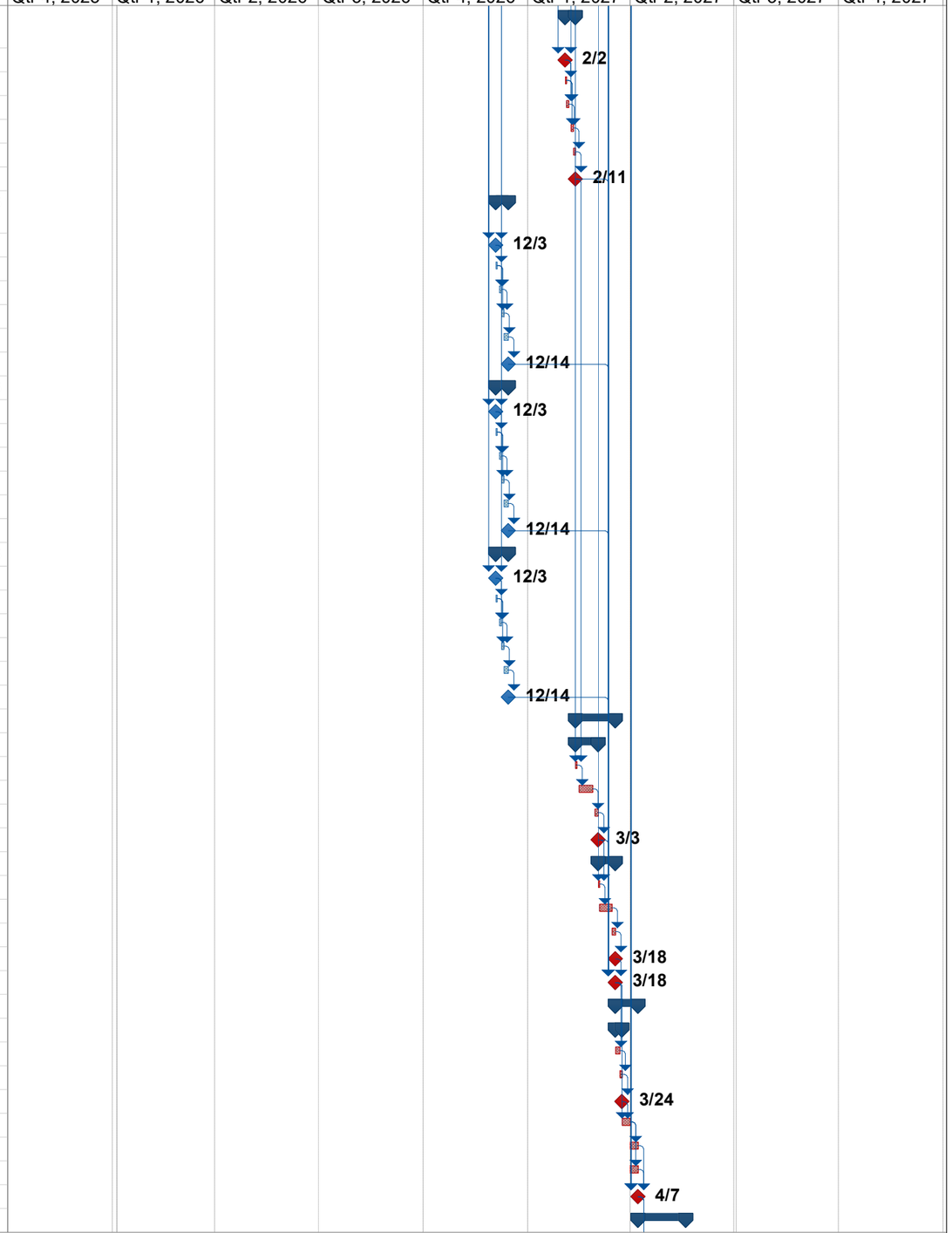
ID	Task Name	% Complete	Duration	Start	Finish
311	MW System Validation and Customer Witnessed Test (CWT)	0%	5 d	Mon 8/17/26	Fri 8/21/26
312	MW Breakdown / Pack for Shipment	0%	2 d	Mon 8/24/26	Tue 8/25/26
313	MW Ship To Field	0%	5 d	Wed 8/26/26	Tue 9/1/26
314	**FNE Equipment Order, Manufacturing and Staging**	**0%**	**105 d**	**Tue 6/2/26**	**Thu 10/29/26**
315	FNE Make Order	0%	0 d	Tue 6/2/26	Tue 6/2/26
316	**FNE Equipment Ordering and Manufacturing**	**0%**	**70 d**	**Wed 6/3/26**	**Thu 9/10/26**
317	FNE Process Equipment List	0%	5 d	Wed 6/3/26	Tue 6/9/26
318	FNE Make Order	0%	5 d	Wed 6/10/26	Tue 6/16/26
319	FNE Manufacture Equipment	0%	60 d	Wed 6/17/26	Thu 9/10/26
320	FNE Equipment Ordering and Manufacturing Complete	0%	0 d	Thu 9/10/26	Thu 9/10/26
321	**FNE System Build and Factory Acceptance Test (FAT)**	**0%**	**35 d**	**Fri 9/11/26**	**Thu 10/29/26**
322	FNE System Build	0%	20 d	Fri 9/11/26	Thu 10/8/26
323	FNE Configure and Validate Equipment	0%	20 d	Fri 9/11/26	Thu 10/8/26
324	FNE Factory Acceptance Test Complete	0%	5 d	Fri 10/9/26	Thu 10/15/26
325	FNE Breakdown / Pack for Shipment	0%	5 d	Fri 10/16/26	Thu 10/22/26
326	FNE Ship to Warehouse	0%	5 d	Fri 10/23/26	Thu 10/29/26
327	Manufacturing and Staging Complete	0%	0 d	Thu 10/29/26	Thu 10/29/26
328	**System Installation**	**0%**	**139 d**	**Thu 8/27/26**	**Thu 3/18/27**
329	Receive and Inventory Non-Staged Equipment	0%	10 d	Thu 8/27/26	Thu 9/10/26
330	Received and Inventory Staged Equipment	0%	10 d	Fri 10/30/26	Thu 11/12/26
331	**DC Installation**	**0%**	**77 d**	**Mon 9/21/26**	**Wed 1/13/27**
332	**State of Florida Tower: DC Installation, Zone Core + Vprime + 10-ch RF Subsite**	**0%**	**13 d**	**Tue 12/22/26**	**Wed 1/13/27**
333	SoF Tower: Site Ready for DC Installation	0%	0 d	Tue 12/22/26	Tue 12/22/26
334	**SoF Tower: DC Power Installation**	**0%**	**5 d**	**Wed 12/23/26**	**Thu 12/31/26**
335	SoF Tower: DC Power Delivery and Installation	0%	3 d	Wed 12/23/26	Tue 12/29/26
336	SoF Tower: Initial DC Plant Power Up	0%	1 d	Wed 12/30/26	Wed 12/30/26
337	SoF Tower: DC Plant ATP	0%	1 d	Thu 12/31/26	Thu 12/31/26
338	**SoF Tower: DC Battery Installation**	**0%**	**7 d**	**Wed 12/30/26**	**Fri 1/8/27**
339	SoF Tower: DC Battery Received at Warehouse	0%	1 d	Wed 12/30/26	Wed 12/30/26
340	SoF Tower: DC Battery Delivered and Installation	0%	3 d	Thu 12/31/26	Tue 1/5/27
341	SoF Tower: DC Battery Initial Charge	0%	3 d	Wed 1/6/27	Fri 1/8/27
342	**SoF Tower: DC System Commissioning**	**0%**	**3 d**	**Mon 1/11/27**	**Wed 1/13/27**
343	SoF Tower: Battery and DC Plant Load Bank Test	0%	3 d	Mon 1/11/27	Wed 1/13/27
344	SoF Tower: DC System Commissioning Complete	0%	0 d	Wed 1/13/27	Wed 1/13/27
345	**Utilities Tower: DC Installation, DSR + Geo-Vprime + 10-ch RF Subsite**	**0%**	**13 d**	**Mon 9/21/26**	**Thu 10/8/26**
346	Utilities Tower: Site Ready for DC Installation	0%	0 d	Mon 9/21/26	Mon 9/21/26
347	**Utilities Tower: DC Power Installation**	**0%**	**5 d**	**Tue 9/22/26**	**Mon 9/28/26**
348	Utilities Tower: DC Power Delivery and Installation	0%	3 d	Tue 9/22/26	Thu 9/24/26
349	Utilities Tower: Initial DC Plant Power Up	0%	1 d	Fri 9/25/26	Fri 9/25/26
350	Utilities Tower: DC Plant ATP	0%	1 d	Mon 9/28/26	Mon 9/28/26
351	**Utilities Tower: DC Battery Installation**	**0%**	**7 d**	**Fri 9/25/26**	**Mon 10/5/26**
352	Utilities Tower: DC Battery Received at Warehouse	0%	1 d	Fri 9/25/26	Fri 9/25/26
353	Utilities Tower: DC Battery Delivered and Installation	0%	3 d	Mon 9/28/26	Wed 9/30/26
354	Utilities Tower: DC Battery Initial Charge	0%	3 d	Thu 10/1/26	Mon 10/5/26
355	**Utilities Tower: DC System Commissioning**	**0%**	**3 d**	**Tue 10/6/26**	**Thu 10/8/26**
356	Utilities Tower: Battery and DC Plant Load Bank Test	0%	3 d	Tue 10/6/26	Thu 10/8/26
357	Utilities Tower: DC System Commissioning Complete	0%	0 d	Thu 10/8/26	Thu 10/8/26
358	**Playa del Sol: DC Installation, 10-ch RF Subsite**	**0%**	**13 d**	**Mon 9/28/26**	**Thu 10/15/26**
359	Playa del Sol: Site Ready for DC Installation	0%	0 d	Mon 9/28/26	Mon 9/28/26
360	**Playa del Sol: DC Power Installation**	**0%**	**5 d**	**Tue 9/29/26**	**Mon 10/5/26**
361	Playa del Sol: DC Power Delivery and Installation	0%	3 d	Tue 9/29/26	Thu 10/1/26



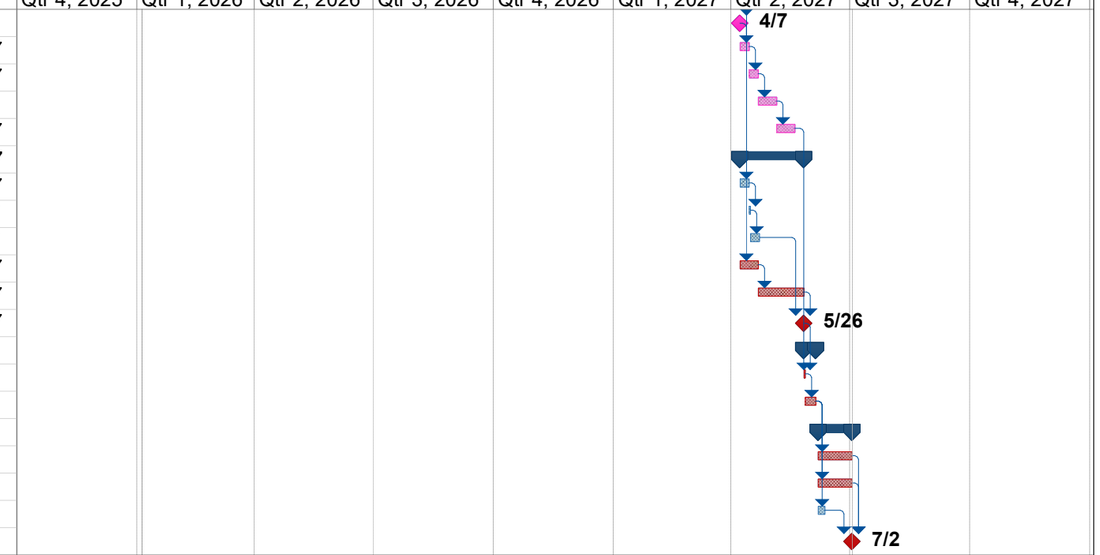
ID	Task Name	% Complete	Duration	Start	Finish
362	Playa del Sol: Initial DC Plant Power Up	0%	1 d	Fri 10/2/26	Fri 10/2/26
363	Playa del Sol: DC Plant ATP	0%	1 d	Mon 10/5/26	Mon 10/5/26
364	**Playa del Sol: DC Battery Installation**	**0%**	**7 d**	**Fri 10/2/26**	**Mon 10/12/26**
365	Playa del Sol: DC Battery Received at Warehouse	0%	1 d	Fri 10/2/26	Fri 10/2/26
366	Playa del Sol: DC Battery Delivered and Installation	0%	3 d	Mon 10/5/26	Wed 10/7/26
367	Playa del Sol: DC Battery Initial Charge	0%	3 d	Thu 10/8/26	Mon 10/12/26
368	**Playa del Sol: DC System Commissioning**	**0%**	**3 d**	**Tue 10/13/26**	**Thu 10/15/26**
369	Playa del Sol: Battery and DC Plant Load Bank Test	0%	3 d	Tue 10/13/26	Thu 10/15/26
370	Playa del Sol: DC System Commissioning Complete	0%	0 d	Thu 10/15/26	Thu 10/15/26
371	**Point of Americas: DC Installation, 10-ch RF Subsite**	**0%**	**13 d**	**Mon 10/5/26**	**Thu 10/22/26**
372	Point of Americas: Site Ready for DC Installation	0%	0 d	Mon 10/5/26	Mon 10/5/26
373	**Point of Americas: DC Power Installation**	**0%**	**5 d**	**Tue 10/6/26**	**Mon 10/12/26**
374	Point of Americas: DC Power Delivery and Installation	0%	3 d	Tue 10/6/26	Thu 10/8/26
375	Point of Americas: Initial DC Plant Power Up	0%	1 d	Fri 10/9/26	Fri 10/9/26
376	Point of Americas: DC Plant ATP	0%	1 d	Mon 10/12/26	Mon 10/12/26
377	**Point of Americas: DC Battery Installation**	**0%**	**7 d**	**Fri 10/9/26**	**Mon 10/19/26**
378	Point of Americas: DC Battery Received at Warehouse	0%	1 d	Fri 10/9/26	Fri 10/9/26
379	Point of Americas: DC Battery Delivered and Installation	0%	3 d	Mon 10/12/26	Wed 10/14/26
380	Point of Americas: DC Battery Initial Charge	0%	3 d	Thu 10/15/26	Mon 10/19/26
381	**Point of Americas: DC System Commissioning**	**0%**	**3 d**	**Tue 10/20/26**	**Thu 10/22/26**
382	Point of Americas: Battery and DC Plant Load Bank Test	0%	3 d	Tue 10/20/26	Thu 10/22/26
383	Point of Americas: DC System Commissioning Complete	0%	0 d	Thu 10/22/26	Thu 10/22/26
384	**MW Installation**	**0%**	**52 d**	**Thu 11/12/26**	**Tue 2/2/27**
385	**SoF Tower: MW Installation,Zone Core + Vprime + 10-ch RF Subsite**	**0%**	**13 d**	**Wed 1/13/27**	**Tue 2/2/27**
386	SoF Tower: Ready for MW Installation	0%	0 d	Wed 1/13/27	Wed 1/13/27
387	SoF Tower: Deliver and Install MW Dish and Lines	0%	3 d	Thu 1/14/27	Tue 1/19/27
388	SoF Tower: Sweep Lines and Pressurize	0%	2 d	Wed 1/20/27	Thu 1/21/27
389	SoF Tower: MW Radio Turn Up and Test	0%	3 d	Fri 1/22/27	Tue 1/26/27
390	SoF Tower: Site Optimization - MW	0%	5 d	Wed 1/27/27	Tue 2/2/27
391	SoF Tower: MW Dish and Lines Complete	0%	0 d	Tue 2/2/27	Tue 2/2/27
392	**Utilities Tower: MW Installation, DSR + Geo-Vprime + 10-ch RF Subsite**	**0%**	**13 d**	**Thu 11/12/26**	**Thu 12/3/26**
393	Utilities Tower: Ready for MW Installation	0%	0 d	Thu 11/12/26	Thu 11/12/26
394	Utilities Tower: Deliver and Install MW Dish and Lines	0%	3 d	Fri 11/13/26	Tue 11/17/26
395	Utilities Tower: Sweep Lines and Pressurize	0%	2 d	Wed 11/18/26	Thu 11/19/26
396	Utilities Tower: MW Radio Turn Up and Test	0%	3 d	Fri 11/20/26	Tue 11/24/26
397	Utilities Tower: Site Optimization - MW	0%	5 d	Wed 11/25/26	Thu 12/3/26
398	Utilities Tower: MW Dish and Lines Complete	0%	0 d	Thu 12/3/26	Thu 12/3/26
399	**Playa del Sol: MW Installation, 10-ch RF Subsite**	**0%**	**13 d**	**Thu 11/12/26**	**Thu 12/3/26**
400	Playa del Sol: Ready for MW Installation	0%	0 d	Thu 11/12/26	Thu 11/12/26
401	Playa del Sol: Deliver and Install MW Dish and Lines	0%	3 d	Fri 11/13/26	Tue 11/17/26
402	Playa del Sol: Sweep Lines and Pressurize	0%	2 d	Wed 11/18/26	Thu 11/19/26
403	Playa del Sol: MW Radio Turn Up and Test	0%	3 d	Fri 11/20/26	Tue 11/24/26
404	Playa del Sol: Site Optimization - MW	0%	5 d	Wed 11/25/26	Thu 12/3/26
405	Playa del Sol: MW Dish and Lines Complete	0%	0 d	Thu 12/3/26	Thu 12/3/26
406	**Site 4: MW Installation, 10-ch RF Subsite**	**0%**	**13 d**	**Thu 11/12/26**	**Thu 12/3/26**
407	Point of Americas: Ready for MW Installation	0%	0 d	Thu 11/12/26	Thu 11/12/26
408	Point of Americas: Deliver and Install MW Dish and Lines	0%	3 d	Fri 11/13/26	Tue 11/17/26
409	Point of Americas: Sweep Lines and Pressurize	0%	2 d	Wed 11/18/26	Thu 11/19/26
410	Point of Americas: MW Radio Turn Up and Test	0%	3 d	Fri 11/20/26	Tue 11/24/26
411	Point of Americas: Site Optimization - MW	0%	5 d	Wed 11/25/26	Thu 12/3/26
412	Point of Americas: MW Dish and Lines Complete	0%	0 d	Thu 12/3/26	Thu 12/3/26
413	**LMR Equipment Installation**	**0%**	**46 d**	**Thu 12/3/26**	**Thu 2/11/27**



ID	Task Name	% Complete	Duration	Start	Finish
414	**SoF Tower: LMR Equipment Installation, Zone Core + Vprime + 10-ch RF Subsite**	**0%**	**7 d**	**Tue 2/2/27**	**Thu 2/11/27**
415	SoF Tower: Site Ready for LMR Equipment Installation	0%	0 d	Tue 2/2/27	Tue 2/2/27
416	SoF Tower: Deliver LMR Equipment	0%	1 d	Wed 2/3/27	Wed 2/3/27
417	SoF Tower: Bolt Down and Cable Equipment	0%	2 d	Thu 2/4/27	Fri 2/5/27
418	SoF Tower: Terminate AC and DC Power	0%	2 d	Mon 2/8/27	Tue 2/9/27
419	SoF Tower: Program/Optimize Site	0%	2 d	Wed 2/10/27	Thu 2/11/27
420	SoF Tower: Site Installation Complete	0%	0 d	Thu 2/11/27	Thu 2/11/27
421	**Utilities Tower: LMR Equipment Installation, DSR + Geo-Vprime + 10-ch RF Subsite**	**0%**	**7 d**	**Thu 12/3/26**	**Mon 12/14/26**
422	Utilities Tower: Site Ready for LMR Equipment Installation	0%	0 d	Thu 12/3/26	Thu 12/3/26
423	Utilities Tower: Deliver LMR Equipment	0%	1 d	Fri 12/4/26	Fri 12/4/26
424	Utilities Tower: Bolt Down and Cable Equipment	0%	2 d	Mon 12/7/26	Tue 12/8/26
425	Utilities Tower: Terminate AC and DC Power	0%	2 d	Wed 12/9/26	Thu 12/10/26
426	Utilities Tower: Program/Optimize Site	0%	2 d	Fri 12/11/26	Mon 12/14/26
427	Utilities Tower: Site Installation Complete	0%	0 d	Mon 12/14/26	Mon 12/14/26
428	**Playa del Sol: LMR Equipment Installation, 10-ch RF Subsite**	**0%**	**7 d**	**Thu 12/3/26**	**Mon 12/14/26**
429	Playa del Sol: Site Ready for LMR Equipment Installation	0%	0 d	Thu 12/3/26	Thu 12/3/26
430	Playa del Sol: Deliver LMR Equipment	0%	1 d	Fri 12/4/26	Fri 12/4/26
431	Playa del Sol: Bolt Down and Cable Equipment	0%	2 d	Mon 12/7/26	Tue 12/8/26
432	Playa del Sol: Terminate AC and DC Power	0%	2 d	Wed 12/9/26	Thu 12/10/26
433	Playa del Sol: Program/Optimize Site	0%	2 d	Fri 12/11/26	Mon 12/14/26
434	Playa del Sol: Site Installation Complete	0%	0 d	Mon 12/14/26	Mon 12/14/26
435	**Site 4: LMR Equipment Installation, 10-ch RF Subsite**	**0%**	**7 d**	**Thu 12/3/26**	**Mon 12/14/26**
436	Point of Americas: Site Ready for LMR Equipment Installation	0%	0 d	Thu 12/3/26	Thu 12/3/26
437	Point of Americas: Deliver LMR Equipment	0%	1 d	Fri 12/4/26	Fri 12/4/26
438	Point of Americas: Bolt Down and Cable Equipment	0%	2 d	Mon 12/7/26	Tue 12/8/26
439	Point of Americas: Terminate AC and DC Power	0%	2 d	Wed 12/9/26	Thu 12/10/26
440	Point of Americas: Program/Optimize Site	0%	2 d	Fri 12/11/26	Mon 12/14/26
441	Point of Americas: Site Installation Complete	0%	0 d	Mon 12/14/26	Mon 12/14/26
442	**Dispatch**	**0%**	**25 d**	**Fri 2/12/27**	**Thu 3/18/27**
443	**Primary Dispatch: Dispatch Installation (8 pos)**	**0%**	**14 d**	**Fri 2/12/27**	**Wed 3/3/27**
444	Primary Dispatch: Deliver Dispatch Equipment	0%	1 d	Fri 2/12/27	Fri 2/12/27
445	Primary Dispatch: Install Dispatch Equipment	0%	10 d	Mon 2/15/27	Fri 2/26/27
446	Primary Dispatch: Program/Optimize Dispatch Equipment	0%	3 d	Mon 3/1/27	Wed 3/3/27
447	Primary Dispatch: Dispatch Installation Complete	0%	0 d	Wed 3/3/27	Wed 3/3/27
448	**Backup Dispatch: Dispatch Installation (6 pos)**	**0%**	**11 d**	**Thu 3/4/27**	**Thu 3/18/27**
449	Backup Dispatch: Deliver Dispatch Equipment	0%	1 d	Thu 3/4/27	Thu 3/4/27
450	Backup Dispatch: Install Dispatch Equipment	0%	7 d	Fri 3/5/27	Mon 3/15/27
451	Backup Dispatch: Program/Optimize Dispatch Equipment	0%	3 d	Tue 3/16/27	Thu 3/18/27
452	Backup Dispatch: Dispatch Installation Complete	0%	0 d	Thu 3/18/27	Thu 3/18/27
453	System Installation Complete	0%	0 d	Thu 3/18/27	Thu 3/18/27
454	**Perform System Acceptance Testing**	**0%**	**14 d**	**Fri 3/19/27**	**Wed 4/7/27**
455	**Microwave Testing - Customer Witnessed**	**0%**	**4 d**	**Fri 3/19/27**	**Wed 3/24/27**
456	MW Sys Hop Testing	0%	2 d	Fri 3/19/27	Mon 3/22/27
457	MW System Test	0%	2 d	Tue 3/23/27	Wed 3/24/27
458	Microwave Testing Complete	0%	0 d	Wed 3/24/27	Wed 3/24/27
459	System Optimization	0%	5 d	Thu 3/25/27	Wed 3/31/27
460	System Acceptance Testing Conducted	0%	5 d	Thu 4/1/27	Wed 4/7/27
461	Document System Acceptance Test Results	0%	5 d	Thu 4/1/27	Wed 4/7/27
462	System Testing Acceptance Complete	0%	0 d	Wed 4/7/27	Wed 4/7/27
463	**System Coverage Acceptance Test (CATP)**	**0%**	**30 d**	**Wed 4/7/27**	**Wed 5/19/27**



ID	Task Name	% Complete	Duration	Start	Finish
464	Drive Test Start Date (Completed in Full Foliage)	0%	0 d	Wed 4/7/27	Wed 4/7/27
465	Drive Test Conducted	0%	5 d	Thu 4/8/27	Wed 4/14/27
466	Critical Building	0%	5 d	Thu 4/15/27	Wed 4/21/27
467	Document CATP Results	0%	10 d	Thu 4/22/27	Wed 5/5/27
468	CATP Acceptance	0%	10 d	Thu 5/6/27	Wed 5/19/27
469	**Training**	**0%**	**35 d**	**Thu 4/8/27**	**Wed 5/26/27**
470	ASTRO 25 IV&D System Applied Networking	0%	5 d	Thu 4/8/27	Wed 4/14/27
471	ASTRO 25 IV&D System Overview	0%	1 d	Thu 4/15/27	Thu 4/15/27
472	ASTRO 25 IV&D Radio System Administrator Workshop	0%	5 d	Fri 4/16/27	Thu 4/22/27
473	Train the Trainer Training	0%	10 d	Thu 4/8/27	Wed 4/21/27
474	End User Training	0%	25 d	Thu 4/22/27	Wed 5/26/27
475	Training Complete	0%	0 d	Wed 5/26/27	Wed 5/26/27
476	**Cut-Over**	**0%**	**6 d**	**Thu 5/27/27**	**Fri 6/4/27**
477	Verify System Readiness	0%	1 d	Thu 5/27/27	Thu 5/27/27
478	Cutover	0%	5 d	Fri 5/28/27	Fri 6/4/27
479	**Project Close**	**0%**	**20 d**	**Mon 6/7/27**	**Fri 7/2/27**
480	Punch List Resolution	0%	20 d	Mon 6/7/27	Fri 7/2/27
481	Finalize Documentation and Deliver As-Builts	0%	20 d	Mon 6/7/27	Fri 7/2/27
482	Complete Service Transition Meeting	0%	5 d	Mon 6/7/27	Fri 6/11/27
483	Final System Acceptance	0%	0 d	Fri 7/2/27	Fri 7/2/27



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City of Fort Lauderdale

Attachment 13 - FCC Type Acceptance for Proposed Equipment

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.1.9.1 FCC Type Acceptance for Proposed Equipment

1.1 Subscriber Radios

FCC Type Acceptance Numbers for Subscriber Radios

Base/Radio Model	Frequency	FCC ID#
APX NEXT Portable	Single or Multiband	AZ489FT7119
APX NEXT XE Portable	Single or Multiband	AZ489FT7119
APX N30	700/800 MHz	AZ489FT7161
APX N50	700/800 MHz	AZ489FT7161
APX N70	700/800 MHz	AZ489FT7147
APX 1500 Mobile/Station	700/800 MHz	AZ492FT7055
APX 4500 Mobile/Station	700/800 MHz	AZ492FT7055
APX 6500 Mobile/Station	700/800 MHz	AZ492FT5858
APX 8500 Mobile/Consolette	Single or Multiband	AZ492FT7089
APX 8500 [multi-watt] Mobile	Single or Multiband	AZ492FT7118

1.2 D-Series Base Stations

FCC Type Acceptance for D-Series Base Stations

Regulatory Data	
Band	US FCC ID
800MHZ	ABZ89FT5901 ABZ89FT5902
700 MHZ	ABZ89FT5911 ABZ89FT5912

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Attachment 14 - List of Special Requirements

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.1.9.2.C List of Special Requirements

Justification for FCC Radio System Contour Waiver: Fort Lauderdale's County-Wide Public Safety Jurisdiction

1. Executive Summary: Fort Lauderdale's Critical Regional Role Warrants Waiver

The City of Fort Lauderdale's emergency services operate as an integral component of Broward County's comprehensive regional public safety framework. This integration is exemplified by the city's active participation in county-wide dispatching and the "Closest Unit Response" program. This operational reality effectively extends Fort Lauderdale's public safety jurisdiction across traditional municipal boundaries for emergency response.

An application of a limited municipal contour map rule for the city's proposed new radio system would directly impede the effectiveness of these established, life-saving regional initiatives. Consequently, a waiver from FRIPS is not merely a request for regulatory flexibility. Instead, it is an important step to ensure the highest level of public safety and seamless interoperability across Broward County. This report demonstrates that Fort Lauderdale's unique operational circumstances constitute the "special circumstances" and that granting the waiver demonstrably serves the "public interest," aligning with established FCC waiver criteria and precedents.

2. Fort Lauderdale's De Facto County-Wide Public Safety Jurisdiction

Fort Lauderdale's emergency response capabilities are deeply interwoven with Broward County's broader public safety infrastructure, creating an operational footprint that extends beyond its city limits. This extended reach is not an informal arrangement but a structured, formalized integration designed to optimize emergency services for all county residents.

Integrated Regional 911 and Closest Unit Response

Fort Lauderdale is an important participant in Broward County's Regional 911 system, a contracted service managed through the Broward Sheriff's Office (BSO). This system encompasses 28 of Broward County's 31 municipalities and is specifically designed to enhance emergency response times and ensure consistent performance metrics by dispatching the closest available unit to an emergency, irrespective of municipal borders. The Office of Regional Communications and Technology for Broward County maintains

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governance and oversight of this system, emphasizing transparency and accountability in service delivery.

The Fort Lauderdale Fire Rescue (FLFR) department is a highly active and critical component within this regional framework, responding to thousands of 911 calls annually, making it one of the busiest city department in Broward County. FLFR explicitly "actively partners with neighboring agencies to ensure the closest unit responds to emergencies," directly supporting the "Closest Unit Response" initiative. Fort Lauderdale was a Phase I participant in this program, which prioritizes the quickest possible response for high-priority calls such as chest pain, heart attacks, or difficulty breathing. This operational integration, enabled by the Regional 911 system, means that Fort Lauderdale's emergency services function with a practical jurisdiction that extends beyond its traditional municipal boundaries. This goes beyond mere mutual aid for extraordinary events; it represents a formalized, legally supported operational integration for daily emergency response across the county.

Formal Inter-local Agreements and Mutual Aid

The operational integration of Fort Lauderdale's emergency services across Broward County is supported by a robust legal and operational framework. Florida law, specifically Chapter 252 of the Florida Statutes, known as the "Emergency Management Act," empowers local governments to enter into "Mutual Aid Agreements" for reciprocal emergency assistance when incidents are "too extensive to be dealt with without assistance". These agreements can cover "major" or "catastrophic disasters" and, if no other agreement exists, "minor" disasters.

A particularly relevant document is the "Interlocal Agreement for Cooperative Fire, Rescue, Emergency Medical Services, Special Operations, and Emergency/Disaster Relief Response Through Mutual Aid, Automatic Aid, and Closest Unit Response". This agreement explicitly states its design is to enable participating parties, including Fort Lauderdale, to "make the most efficient use of their respective powers, resources and capabilities by cooperating" and to "provide for closest unit response as part of the normal day-to-day operations of all of the Parties". The agreement further acknowledges that Broward County residents voted for county-wide communications infrastructure to support these efforts. This demonstrates that Fort Lauderdale's cross-jurisdictional operations are deeply embedded in Florida's public safety policy and practice, making the city's operational area functionally county-wide for emergency response.

Furthermore, a "Regional Incident and Mutual Aid Network" is recognized as a "Regional Public Safety Communications Network" in Florida, fostering "collaboration, information sharing and voice interoperability" among 911 centers, local dispatch, and county Emergency Operations Centers. Florida Statutes also allow for a statewide radio communications system to serve local law enforcement agencies through "mutual aid channels," promoting "public safety and domestic security". The consistent emphasis on "collaboration, information sharing and voice interoperability" and the provision for "mutual aid channels" indicate that seamless communication across jurisdictional lines is a fundamental policy objective at both county and state levels. A radio system designed to cover the entire operational area, rather than being

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constrained by municipal boundaries, directly supports this critical goal of interoperability, which is paramount for effective public safety and disaster response.

The following table summarizes Fort Lauderdale's integration into the regional public safety framework:

Table: Fort Lauderdale's Regional Public Safety Integration

Program/Agreement	Scope/Purpose	Fort Lauderdale's Role	
Regional 911 System	Centralized dispatching for 28 of 31 Broward County municipalities; improves response times and ensures consistent metrics.	Participating municipality.	
Closest Unit Response (CUR)	Dispatches nearest ambulance/fire truck regardless of municipal boundaries for high-priority calls; prioritizes quickest response.	Phase I participant; FLFR actively partners with neighboring agencies.	
Interlocal Agreement for Cooperative Fire, Rescue, EMS, etc.	Formalizes mutual aid, automatic aid, and CUR as "normal day-to-day operations" across Broward County.	Signatory/Participating Party.	
Regional Incident and Mutual Aid Network (State Level)	Fosters collaboration, information sharing, and voice interoperability across regional public safety entities.	Integrated into the broader state/regional communications framework.	

3. Legal Precedent and Public Interest Justification for Waiver

The request for a waiver of contour map limitations for Fort Lauderdale's new radio system is firmly rooted in established FRIPS waiver criteria and supported by numerous precedents where the Commission has prioritized public safety operational realities.

FCC Waiver Criteria

The FCC consistently applies a two-pronged test for granting waivers of its rules. A waiver is considered appropriate only if (1) "special circumstances warrant a deviation from the general rule," and (2) "such deviation better serves the public interest". Applicants seeking a waiver face a "high hurdle" and must present a "compelling showing" to justify the deviation. Alternatively, a waiver may be granted "in view of unique or unusual factual circumstances".

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This legal framework provides the precise context for Fort Lauderdale's waiver request. The city's unique operational integration within Broward County, as detailed previously, clearly constitutes the "special circumstances" or "unique factual circumstances" required. The subsequent discussion will demonstrate how a county-wide radio system demonstrably serves the "public interest" by enhancing regional emergency response.

Precedent for Inter-agency Cooperation

These precedents establish that the Commission is willing to grant waivers to accommodate the operational realities and public safety needs of inter-agency and inter-jurisdictional communication systems. The consistent thread through these cases is the prioritization of effective public safety operations and interoperability over strict adherence to rules when a compelling public interest is demonstrated. This demonstrates that Fort Lauderdale's situation, characterized by its county-wide operational reach and the need for broader coverage for regional response, aligns with scenarios where the FCC has historically shown flexibility. The FCC's consistent focus on "public interest," "interoperability," and "enhancing coverage" in past waiver decisions suggests that a waiver request from Fort Lauderdale, framed around these benefits for Broward County, aligns strongly with the Commission's stated objectives for public safety spectrum management.

Florida-Specific Precedents

Florida has a documented history of establishing and seeking regulatory flexibility for county-wide and statewide public safety radio systems, further supporting the Fort Lauderdale waiver request:

- **Statewide Mutual Aid System Waiver:** In a significant precedent, the State of Florida was granted an FCC waiver in 1985 to permit the "exclusive use of frequency without regard to loading for mutual aid purposes" on 853.3875 MHz/808.3875 MHz. This waiver facilitated the construction of 90 fixed stations to provide "complete statewide mutual aid coverage on this channel for all public safety agencies within Florida." This demonstrates the FCC's direct approval for a statewide system designed for broad mutual aid coverage, explicitly waiving rules to achieve this public safety objective.
- **Marion County Public Safety Radio System:** Marion County, Florida, operates a Public Safety Radio Communications System that incorporates microwave transmission and is authorized by FCC license rules. This system is designed to coordinate emergency communications for public safety agencies and entities, supporting both routine and emergency inter- and intra-agency communications, including out-of-county operations. It also facilitates mutual aid through dedicated talk groups, emphasizing the goal of maximizing public safety and first responder well-being. This exemplifies a county-level system with a broad operational scope.
- **Broward County Regional Interlocal Agreement:** The Regional Interlocal Agreement in Broward County, entered into pursuant to Florida Statutes §163.01, aims to establish a "county-wide interoperable public safety intranet that can support closest unit response in life-threatening emergencies and regional specialty teams." This agreement explicitly seeks to enhance radio interoperability by interconnecting county and city

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public safety radio users and states that the Trunked Radio System will meet FCC-determined coverage, functionality, and availability parameters. This further underscores the established intent and framework for county-wide public safety communication in Broward.

- **Florida's Pursuit of Expanded Coverage:** While a specific waiver request by Florida to utilize 800 MHz Public Safety Category channels on non-standard centers was denied due to technical interference prediction methodology, the request itself highlighted Florida's aim to expand coverage for "Countywide" areas. The FCC had also previously granted similar "offset" waivers in Florida in the same area. This indicates a consistent effort by Florida entities to achieve broader radio coverage for public safety and the FCC's consideration of such requests.

Enhanced Public Safety as Public Interest

The core mission of public safety radio licensing, as explicitly recognized by the FCC, is to "promote public safety and emergency response". Eligibility for the Public Safety Pool is open to governmental entities for "communications essential to official activities of the licensee".

A radio system designed to cover Fort Lauderdale's operational reach across Broward County, rather than being confined to a limited municipal contour, directly supports the "Closest Unit Response" program's objective of delivering the "quickest possible response". This ensures seamless communication for emergency responders operating anywhere within the county as part of their routine duties, as formalized by the interlocal agreements. Such a system also enhances "collaboration, information sharing and voice interoperability" across all Broward County public safety agencies, which is a key objective of Florida's statewide radio communications system and mutual aid agreements.

The proposed radio system, by enabling county-wide coverage for Fort Lauderdale's emergency services, directly aligns with and significantly enhances the FCC's stated objective of promoting "public safety and emergency response" and the state's goal of "interoperability". The waiver, therefore, is not a deviation from regulatory intent but a facilitation of it in a complex operational environment where emergency response inherently transcends strict municipal lines. If Fort Lauderdale's emergency units are obligated to respond county-wide under the "Closest Unit Response" program, but their radio system cannot reliably cover that area due to a strict contour limit, it would create dangerous operational gaps. These gaps would directly compromise the safety of both responders and the public by impeding real-time communication during emergencies. This scenario would directly frustrate the underlying purpose of public safety rules by hindering critical emergency communications, thereby strengthening the argument for a waiver based on "special circumstances" and the paramount "public interest."

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4. Conclusion: Operational Imperative for Regulatory Flexibility

The City of Fort Lauderdale's deep integration into Broward County's regional public safety system, particularly through the Regional 911 and "Closest Unit Response" programs, establishes a compelling case for its operational jurisdiction extending throughout the county for emergency services. This is further solidified by formal inter-local agreements and state-level mandates for interoperability.

Given this established operational reality, a strict application of a municipal-centric contour map rule would actively hinder the efficient and effective provision of emergency services. Such a limitation would directly undermine the public interest in rapid and seamless emergency response across Broward County.

Drawing upon established FCC waiver precedents for inter-agency cooperation and enhanced public safety, Fort Lauderdale's proposal for a radio system with county-wide coverage demonstrably constitutes the "special circumstances" and serves the "public interest" required for a waiver. Granting this waiver will enable a radio system that truly reflects and supports the critical, life-saving scope of Fort Lauderdale's public safety operations within Broward County, ensuring optimal emergency response for all residents.

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Attachment 15 - Sample Acceptance Test Plan

RFP #549

December 18, 2025

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Section 1

RFP Section 3.1.14.2.D Coverage Acceptance Test Plan

Overview

This Coverage Acceptance Test Plan (CATP) is designed to verify that the voice radio system implemented by Motorola Solutions for the City of Fort Lauderdale meets or exceeds the required reliability as shown on Motorola Solutions' maps. The CATP defines the coverage testing method and procedure, the coverage acceptance criterion, the test documentation, and the responsibilities of both Motorola Solutions and the City of Fort Lauderdale.

Coverage Acceptance Testing is based upon a coverage prediction that accurately represents the implemented infrastructure and parameters that are consistent with the contract agreements. [To characterize system performance accurately, the actual user equipment radio series deployed for the City of Fort Lauderdale will be used to conduct the coverage test.]

Subsequent sections define the coverage acceptance test configuration(s) and test criteria.

The design presented in this proposal requires a waiver to the Region 9 Regional Planning Committee's Radio Communications Plan requirement that "*The Protected Service Area Contour (PSAC) of a base station is the +40 dBu signal strength contour as calculated by FRIP. The geographical extent of the PSAC [Protected Service Area Contour] is limited to no more than three (3) miles beyond the boundary of the entity's legal* ***jurisdiction***" or agreement by the Committee that the City's jurisdiction extends beyond city limits.Since Broward County currently dispatches for the City of Fort Lauderdale and since the City is also a part of the "Closest Unit Response" program with Broward County, it is highly likely that it can be argued that the City of Fort Lauderdale has jurisdiction within Broward County and thus granting of a waiver should be fairly easy. To support the waiver application, Motorola has provided an Executive Summary with our research which can be used by the City to apply for the required waivers. This can be found in Attachment 14 – 3.1.9.2.B List of Special Requirements. To further maximize the likelihood of a successful waiver for the contour reach required by an RFP-compliant design, Motorola Solutions has selected channels from the City's current FCC licenses that are not used by nearby incumbents and will maintain the interference protection criteria to all other existing systems. In the event that such approval is not granted, Motorola's guaranteed service area reliabilities would change as necessary to shrink the 40 dBµV/m contour sufficiently to satisfy the above rule or to the extent that the Regional Planning Committee authorizes.

CATP Definitions

Several definitions are needed to accurately describe the coverage acceptance test method and criteria. Where cited, these terms or methods are defined in TIA TSB-88.1-F or TSB-88.3-F.

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Defined Test Area

The defined test area is the geographical area in which communications will be provided that meet or exceed the specified Channel Performance Criterion (CPC) at the specified reliability for the specified equipment configurations. The defined test areas are listed in Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary, along with names of the corresponding Motorola Solutions map(s) which show the defined test areas. Please see Attachment 18 – 3.4.15.5 Configuration Diagrams & Coverage Maps for the maps.

For coverage testing, each defined test area will be divided into a grid pattern by Motorola Solutions to produce at least the number of uniformly sized test locations (or tiles) required by the Estimate of Proportions formula [TSB-88.3-F, §5.2.1, equation 2]. The minimum number of test tiles required varies, from a hundred to many thousands, depending on the size of the defined test area, desired confidence in results, type of coverage test, and the predicted versus required reliability.

Channel Performance Criterion (CPC)

The CPC is the specified minimum design performance level in a faded channel. [TSB-88.1-F, §5.2] For this system, the CPC is the Delivered Audio Quality (DAQ) as stated in Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary. The DAQ definitions are provided in Table 1-1: DAQ Definitions. [TSB-88.1-F, §5.4.2, Table 3].

Table 1-1: DAQ Definitions

DAQ	Subjective Performance Description
1	Unusable, speech present but unreadable.
2	Understandable with considerable effort. Frequent repetition due to noise/distortion.
3	Speech understandable with slight effort. Occasional repetition required due to noise/distortion.
3.4	Speech understandable with repetition only rarely required. Some noise/distortion.
4	Speech easily understood. Occasional noise/distortion.
4.5	Speech easily understood. Infrequent noise/distortion.
5	Speech easily understood.

The CPC pass/fail criterion is the faded performance threshold, plus any adjustments for antenna performance, external noise, and in-building or in-vehicle losses [TSB-88.1-F, §5.4.2, Figure 6]. The faded performance threshold for the specified CPC is determined using the receiver's static reference sensitivity adjusted by the projected CPC parameters for the applicable Modulation Type and DAQ as listed in the current version of TSB-88.1, Annex A, Table A-1. For coverage testing of digital voice radio systems, the faded performance threshold is the applicable Bit Error Rate (BER) from the projected CPC parameters.

Reliability

The Service Area reliability is the percentage of locations within the defined test area that are predicted to meet or exceed the specified CPC. The Motorola Solutions map(s) indicate the Service Area(s) within which this system is predicted to provide at least the reliability of meeting or exceeding the CPC as stated in Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary.

After all accessible tiles in the defined test area have been tested, the Service Area reliability will be determined by dividing the number of tiles tested that meet or exceed the CPC pass/fail criterion by the total number of tiles tested. [TSB-88.3-F, §5.1, equation 1]

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Direction(s) of Test

The direction(s) of test in Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary defines the direction(s) which will be tested for coverage acceptance. Outbound (also called forward link, downlink, or talk-out) is the path from the fixed equipment outward to the mobile or portable radios. Inbound (also called reverse link, uplink, or talk-in) is the path from the mobile or portable radios inward to the fixed equipment.

Equipment Configurations

This section defines the equipment configurations and infrastructure design parameters upon which the coverage guarantee and the coverage acceptance test are based. The equipment configurations are defined in Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary, and include user equipment, outdoor/in-building definition, defined test area, number of test tiles, reliability, CPC, CPC pass/fail, and direction(s) of test. The infrastructure design parameters are defined in Table 1-3: City of Fort Lauderdale Infrastructure Design Parameters, and include site names, site locations, and antenna system parameters.

If the implemented system equipment configuration and/or infrastructure design parameters vary from those provided in Table 1-2 and/or Table 1-3, Motorola reserves the right to update the coverage maps and associated guarantees.

Coverage testing will be conducted with equipment installed per the configurations in Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary, and with the test antennas in unobstructed locations that are not adjacent to other large objects or metallic items which would distort the antenna patterns.

To keep the duration of the testing schedule reasonable for both parties, and given the trend that older FDMA-only subscribers are being retired from use over time, Motorola proposes that coverage tests be conducted in TDMA mode only.

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REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary

User Equipment	Committed Building Loss	Outdoor / In-Building	Defined Test Area & Map Name	Number of Test Tiles	Reliability	CPC	CPC Pass/Fail	Direction(s) of Test
APX N50 Portable with 1/4 wave stubby antenna (AN000418A01) in swivel case with remote speaker microphone for transmit and in swivel case with remote speaker microphone for receive	20 dB	Attenuated Drive Test	City + 1 Mile (Map 10)	1374 (0.25 mile tiles)	95%	DAQ-3.4	2.6% BER Inbound	Inbound Only
APX N50 Portable with 1/4 wave stubby antenna (AN000418A01) in swivel case with remote speaker microphone for transmit and in swivel case with remote speaker microphone for receive	20 dB	Attenuated Drive Test	City + 1 Mile (Map 10)	1374 (0.25 mile tiles)	95%	DAQ-3.4	2.4% BER Outbound	Outbound Only
APX N50 Portable with 1/4 wave stubby antenna (AN000418A01) in swivel case with remote speaker microphone for transmit and in swivel case with remote speaker microphone for receive	15 dB	Attenuated Drive Test	City + 2 Miles (Map 9)	1717 (0.25 mile tiles)	97%	DAQ-3.4	Subjective	Inbound Only
APX N50 Portable with 1/4 wave stubby antenna (AN000418A01) in swivel case with remote speaker microphone for transmit and in swivel case with remote speaker microphone for receive	15 dB	Attenuated Drive Test	City + 2 Miles (Map 9)	1717 (0.25 mile tiles)	97%	DAQ-3.4	Subjective	Outbound Only
APX N50 Portable with 1/4 wave stubby antenna (AN000418A01) in swivel case with remote speaker microphone for transmit and in swivel case with remote speaker microphone for receive	N/A	Outdoor	City + 2 Miles (Map 9)	1717 (0.25 mile tiles)	97%	DAQ-3.4	2.6% BER Inbound	Inbound Only
APX N50 Portable with 1/4 wave stubby antenna (AN000418A01) in swivel case with remote speaker microphone for transmit and in swivel case with remote speaker microphone for receive	N/A	Outdoor	City + 2 Miles (Map 9)	1717 (0.25 mile tiles)	97%	DAQ-3.4	2.4% BER Outbound	Outbound Only
APX N50 Portable with 1/4 wave stubby antenna (AN000418A01) in swivel case with remote speaker microphone for transmit and in swivel case with remote speaker microphone for receive	20 dB	In-Building for specific buildings listed in Table 1.4a	Buildings listed in Table 1-4a	N/A	95%	DAQ-3.4	Subjective	Inbound and outbound
		In-Building for	Schools listed in	N/A	95%	DAQ-3.4	Subjective	Inbound and

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APX N50 Portable with 1/4 wave stubby antenna (AN000418A01) in swivel case with remote speaker microphone for transmit and in swivel case with remote speaker microphone for receive

Table 1-3: City of Fort Lauderdale Infrastructure Design Parameters

Site Name	Latitude	Longitude	Transmit Antenna System				Receive Antenna System				
			Height	Azimuth	Antenna Model	ERP (watts)	Height	Azimuth	Antenna Model	External Noise assumed (relative to KToB)	EFS (dBm)
Trunking Simulcast Subsystem											
Playa del Sol	26° 10' 17.5" N	80° 5' 54.5" W	280 ft	270°	dbSpectra DS7C11PPYU6M	260.7 watts	280 ft	0°	dbSpectra DS7C12P36U-M	N/A	-124.68 dBm
Point of Americas	26° 5' 47.6" N	80° 6' 26" W	255 ft	300°	dbSpectra DS7C08PPVU6M	125.1 watts	255 ft	0°	dbSpectra DS7C12P36U-M	N/A	-124.68 dBm
State of Florida Tower	26° 7' 25.6" N	80° 10' 20" W	180 ft	0°	dbSpectra DS7C10P36U3M	166 watts	180 ft	0°	dbSpectra DS7C12P36U-M	N/A	-124.68 dBm
Utilities	26° 10' 35.6" N	80° 9' 25.1" W	180 ft	0°	dbSpectra DS7C10P36U3M	166 watts	180 ft	0°	dbSpectra DS7C12P36U-M	N/A	-124.68 dBm

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Adjacent Test Tile Failures

After the CATP is completed, the adjacent test tile failures will be analyzed independently for each user equipment configuration and defined test area indicated below.

For any test tiles which fail the adjacent test tile failure requirement, Motorola Solutions reserves the right to subdivide and test any failed adjacent test tiles with finer granularity, to determine with greater accuracy (by using more samples) whether the area these tiles represent is really failing. This approach is supported in TSB-88.3-G §5.5.6. Subdivision testing will only be applied for the adjacent test tile failure requirement.

For both Inbound and Outbound tests, adjacent test tile failure user equipment configurations and defined test areas are those listed in the first six rows of Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary.

The adjacent test tile failure analysis will determine whether or not there are any patterns of test tiles with sides in common, in straight lines (including diagonals or "L" shapes) or rectangles with 6 or more adjacent test tile failures.

If more than the allowed adjacent test tiles fail during the CATP, any of the failed adjacent test tiles can be subdivided into four (4) smaller sub-tiles, which will then be tested. If three (3) of the four (4) sub-tiles pass, the original failed test tile will be considered as passing for the adjacent test tile requirement, and the adjacent test tile failures will be re-analyzed. If sub-tiles within a failed tile are inaccessible, the inaccessible sub-tiles will be removed from the calculations for adjacent test tile failure, and a majority of the remaining sub-tiles must pass. If enough subdivided adjacent test tiles pass, such that the allowed number of adjacent test tile failures is no longer exceeded, then the adjacent test tile failure requirement is passed. After subdividing and testing all failed adjacent tiles, if the adjacent test tile failure requirement is still exceeded, then Motorola Solutions will work with the City of Fort Lauderdale to find potential resolutions. Subdivided tiles are only for use in further evaluating adjacent test tile failures; these subdivided tiles do not apply to the Service Area Reliability Coverage Acceptance Test calculation.

In-Building Coverage

Attenuated Drive Testing

Motorola Solutions' coverage predictions for portable in-building equipment configurations include additional loss to accommodate in-building coverage as stated in Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary.

Aside from the Specific Building (Critical Building) tests, the test configurations outlined above do not imply testing inside actual buildings. These tests will be conducted as grid-based service-area-wide coverage tests, with attenuation introduced into the antenna feed-line of the test kit, to simulate the prescribed level of building loss.

The in-building coverage maps apply only to the above ground portions of buildings. The coverage maps do not apply to in-building locations that are shielded from radio penetration, such as elevators, basements below ground level, tunnels, bank vaults, jails, x-ray rooms, nuclear facilities, and other locations shielded by metal walls or with heavy construction and with no external windows or doors.

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Specific Building (Critical Building) Testing

Coverage has been designed to accommodate the (19) buildings that were specified in Appendix D of the RFP and the schools identified in the *ServiceAreaSchools.shp* shapefile provided to proposers as an addendum to the RFP.

Of the 118 schools found in the shapefile, five were determined to be duplicate locations, resulting in 113 school locations being considered. The duplicate locations were named as: Learning With Confidence Christian Academy, Our Lady Queen Of Martyrs (duplicate location with Independence High School), Faith Deliverance Development LLC, Somerset Village Academy Middle, and Charter School Of Excellence.

For reference, the applicable buildings and schools are listed below.

Building	Address
Police Headquarters	1300 W. Broward Blvd., Fort Lauderdale FL 33312
Police Headquarters	1350 W. Broward Blvd., Fort Lauderdale FL 33312
Police Horse Barn	700 NE 9 Street, Fort Lauderdale FL 33304
Police Internal Affairs Office	255 NE 3 Avenue, Fort Lauderdale FL 33301
Police Substation	533 NE 13 Street, Fort Lauderdale FL 33304
Police Substation	1815 Cordova Road, Fort Lauderdale FL 33316
Police Substation	1409 NW 6 Street, Fort Lauderdale FL 33311
Fire Station 2 - Admin./ HQ	528 NW 2nd St., Fort Lauderdale FL 33311
Fire Station 3	2801 SW 4th Ave., Fort Lauderdale FL 33315
Fire Station 8	1717 SW 1st Ave., Fort Lauderdale FL 33315
Fire Station 13	2871 East Sunrise Blvd., Fort Lauderdale FL 33304
Fire Station 16	533 NE 22nd St., Wilton Manors FL 33305
Fire Station 29	2002 NE 16th St., Fort Lauderdale FL 33304
Fire Station 35	1969 East Commercial Blvd., Fort Lauderdale FL 33308
Fire Station 46	1515 NW 19th St., Fort Lauderdale FL 33311
Fire Station 47	1000 SW 27th Ave., Fort Lauderdale FL 33312
Fire Station 49	1015 Seabreeze Blvd., Fort Lauderdale FL 33316
Fire Station 53	2200 Executive Airport Way, Fort Lauderdale FL 33309
Fire Station 54	3211 NE 32nd St., Fort Lauderdale FL 33308

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Table 1-4a: List of Specific Buildings other than Schools

Facility	Latitude	Longitude
Almarie Christian Academy	26.1530	-80.1770
Art Institute Of Fort Lauderdale	26.1010	-80.1235
Barry University	26.1886	-80.1690
Bayview Elementary	26.1412	-80.1171
Bennett Elementary	26.1454	-80.1233
Bethany Christian School 1	26.1118	-80.1365
Bethany Christian School 2	26.1110	-80.1364
Boys and Girls Cliub Of Broward	26.1029	-80.1764
Boys and Girls Clubs Of Broward County Nan Knox Club	26.1236	-80.1529
Broward Childrens Center South 1	26.0942	-80.1854
Broward Childrens Center South 2	26.0937	-80.1854
Broward College	26.1195	-80.1408
Broward Detention Center	26.1240	-80.1714
Calvary Christian Academy	26.2049	-80.1751
Cardinal Gibbons High School	26.1849	-80.1083
Charter School Of Excellence	26.1069	-80.1403
Charter School Of Excellence Riverland	26.1042	-80.1946
Children In The Spirit Christian School	26.1261	-80.1513
Christ Church School	26.1882	-80.1122
Church By The Sea School	26.1008	-80.1105
City College	26.2038	-80.1623
Compass Outreach And Education Center	26.1142	-80.1631
Cradle Learning Center	26.1305	-80.1588
Croissant Park Elementary	26.0991	-80.1453
Cypress Preschool Inc	26.1512	-80.1322
Dandy William E Middle	26.1564	-80.1758
Delmar Arts Academy	26.1442	-80.1181
Dillard 6 12	26.1395	-80.1763
Dillard Elementary	26.1402	-80.1734
Edith Robinson Christian Academy	26.1419	-80.1410
Elite Academy School Of Excellence	26.2018	-80.1859
Faith Deliverance Development LLC	26.1296	-80.1567
Faith Lutheran School	26.1074	-80.1850
Fidelis Academy	26.1536	-80.1551

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Floranada Elementary	26.1915	-80.1290
Florida Atlantic University 1	26.1891	-80.1656
Florida Atlantic University 2	26.1202	-80.1408
Florida International University	26.1201	-80.1415
Fort Lauderdale Christian School	26.2043	-80.1868
Fort Lauderdale College	26.1393	-80.1147
Fort Lauderdale High	26.1491	-80.1393
Fort Lauderdale Learning Center	26.0969	-80.1466
Foster Stephen Elementary	26.0954	-80.1920
Frannys Learning Loft	26.1010	-80.1345
Gateway Christian Academy	26.1580	-80.1719
Gospel Arena Preschool Inc	26.1300	-80.1472
Harbordale Elementary	26.1024	-80.1333
Holy Temple Christian Academy	26.1513	-80.1541
Independence High School	26.1085	-80.1790
Inspirations For Youth And Families LLC	26.1099	-80.1440
Jack and Jill Children’s Center	26.1223	-80.1592
Jacklyn Academy	26.1182	-80.1783
JFK Academy Of Fort Lauderdale 1	26.1074	-80.1655
JFK Academy Of Fort Lauderdale 2	26.1074	-80.1646
Keiser University	26.1863	-80.1637
Kids In Action	26.1846	-80.1352
Kids In Distress Inc	26.1596	-80.1357
Kla Schools Of Fort Lauderdale	26.1679	-80.1067
Kumon Fort Lauderdale	26.1668	-80.1195
Learning With Confidence Christian Academy	26.1133	-80.1775
Lighthouse Christian Academy	26.1708	-80.1359
Little Green Library	26.1296	-80.1562
Little Palms Child Enrichment	26.1496	-80.1328
Lloyd Estates Elementary	26.1763	-80.1527
Marshall Thurgood Elementary	26.1410	-80.1530
Mavericks High Of Central Broward	26.1362	-80.1486
Mount Bethel Christian Academy	26.1352	-80.1571
New Hope Christian School	26.2053	-80.1872
New Hope Learning Center	26.1146	-80.1933
New Life Charter Academy	26.1041	-80.1946
New River Middle	26.0902	-80.1862

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North Andrews Gardens Elementary	26.1968	-80.1418
North Broward Christian School	26.1520	-80.1749
North Fork Elementary	26.1230	-80.1627
North Side Elementary	26.1379	-80.1429
Northeast High	26.1941	-80.1363
Oakland Park Elementary	26.1678	-80.1355
Pace Center For Girls Inc	26.1565	-80.1469
Pine Crest Preparatory School	26.2047	-80.1271
Precious Promise Academy	26.1889	-80.1784
Rickards James S Middle	26.2018	-80.1339
Riverland Elementary	26.1089	-80.1766
Rock Island Elementary	26.1499	-80.1724
Saint Anthony School	26.1250	-80.1349
Saint Jerome Catholic School	26.0899	-80.1539
Saint Thomas Aquinas High School	26.1085	-80.1812
Sandra Marie Curtis High School	26.1362	-80.1487
School Of Excellence	26.1050	-80.1957
Seagull School	26.0899	-80.1479
Shalom Preschool Chabad	26.1716	-80.0996
Shepard Of The Coast	26.1895	-80.1207
Sheridan Technical Center High	26.1014	-80.1975
Showers Of Blessings Christian Academy	26.1539	-80.1730
Somerset Village Academy	26.1630	-80.1481
South Florida Montessori Academy	26.1313	-80.1466
St MarkS Episcopal School	26.1658	-80.1232
Stranahan High	26.1127	-80.1648
Suned High School Of South Broward	26.1061	-80.1786
Sunfire High School	26.1651	-80.1745
Sunland Park Academy	26.1352	-80.1597
Sunrise Middle	26.1435	-80.1239
Sunset Sudbury School	26.0931	-80.1601
Tender Care Learning Center	26.0981	-80.1390
TotS Town Inc	26.1650	-80.1818
Trinity Lutheran School	26.1097	-80.1437
UCP Early Beginnings 1	26.1036	-80.1865
UCP Early Beginnings 2	26.1038	-80.1862
Walker Elementary	26.1267	-80.1558

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Westminster Academy	26.1972	-80.1126
Westwood Heights Elementary	26.1110	-80.1825
Whiddon Rogers Educational	26.0899	-80.1497
Wilton Manors Elementary	26.1581	-80.1431
Young Virginia S Elementary	26.1235	-80.1329

Table 1-4b: List of Schools

Motorola Solutions has designed the coverage so that these buildings will be covered at the required 95% reliability up to the in-building loss stated in Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary.

Specific building test locations shall be governed by the street addresses or latitude/longitude coordinates tabulated above. Motorola makes no representation that the addresses/coordinates still house or correspond to the named facility. If a school or facility has relocated from the location listed above, any in-building test conducted at the facility's new location will be in lieu of the test at the listed location and will be conducted for informational purposes only.

CPC Pass/Fail Criteria for a Test Tile

Motorola Solutions asserts that this section contains Trade Secret information as defined in Florida Statute 688.002 that is exempt from public records disclosure per Florida Statute 119.0715.

For each equipment configuration, the CPC pass/fail criteria for a test tile is stated in Table 1-2 Coverage Acceptance Test Summary each equipment configurations[s] will have only one CPC pass or fail criterion for a test tile.

To measure BER, the coverage test will be performed with the appropriate attenuator value installed in the test radio antenna line, to establish an equivalent signal level performance for each equipment configuration.

Coverage for the portable outdoor and attenuated building equipment configurations will be verified for acceptance by attenuation of the test radio for BER and DAQ tests. The attenuation will be the difference between the test radio's antenna system and the additional loss used in Motorola Solutions' coverage prediction to account for portable antenna performance. The attenuator values are provided in Table 1-5: Attenuator Values to Evaluate Each Equipment Configuration.

This provides a method of verifying that the radio system provides the required BER or DAQ for the specified CPC for each of the defined equipment configurations.

Below are the attenuator value calculations that will be used to evaluate each equipment configuration. The methodology to determine the attenuator value is demonstrated in TSB-88.1-F §5.4.2, Figure 6. The attenuator value includes the proper values for the equipment configuration requirement plus adjustments for the test equipment setup. Should the test equipment setup losses (e.g. cable length) vary, an adjustment to the attenuator value may be required to represent the required equipment configuration accurately.

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Table 1-5: Attenuator Values to Evaluate Each Equipment Configuration

User Equipment	Attenuator Value (dB)
Portable Outdoors	[portable antenna loss] + [mobile test antenna gain] + [height correction factor] – [measured coax/connector loss]
Portable In Building	[portable antenna loss] + [building penetration loss] + [mobile test antenna gain] + [height correction factor]] – [measured coax/connector loss]

Where:

[portable antenna/body loss] = 8.9 dBd. This is the loss of the portable model and antenna combination noted in Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary, when worn on the body.

[mobile test antenna gain] is the gain of the antenna mounted on the roof for drive testing, relative to a half-wave dipole reference antenna. Typically this value is -1 dB when a quarter-wave roof-mount antenna is used for drive testing.

[height correction factor] is a small adjustment to offset any beneficial increase between the test antenna height and the antenna height noted in Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary. For a 5ft survey vehicle height, this adjustment is 1.3 dB.

[measured coax/connector loss] is the loss in the test cable, connectors and attenuator unit when set to zero attenuation, that are connected between the test portable and the test antenna. This loss will be denoted on the test kit's calibration certificate.

Motorola Solutions asserts that this section contains Trade Secret information as defined in Florida Statute 688.002 that is exempt from public records disclosure per Florida Statute 119.0715.

Required Number of Test Tiles in the Defined Test Area

The method used to test coverage is a statistical sampling of the defined test area to verify that the CPC is met or exceeded at the required reliability for each of the defined equipment configurations. It is impossible to verify every point within a defined test area, because there are infinite points; therefore, coverage reliability will be verified by sampling a statistically significant number of randomly selected locations, quasi-uniformly distributed throughout the defined test area. There is one test sample per test tile, where a sample consists of multiple sub-samples.

Coverage acceptance testing will be performed in the defined test area as indicated on Motorola Solutions-provided maps. To verify that the reliability requirement is met, the defined test area indicated on Motorola Solutions' maps will be divided into uniformly sized test tiles, with at least the number of test tiles indicated in Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary. The number of test tiles indicated in Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary is at least the minimum required by the Estimate of Proportions formula as stated in section 1.2.1 (Defined Test Area) of this document.

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Per TSB-88.3-F, the stated minimum outdoor test tile size is 100 by 100 wavelengths; however, the *practical* minimum size of test tiles is typically about 400 by 400 meters (about 0.25 by 0.25 miles). The minimum practical tile size for any system is determined by the distance traveled at the speed of the test vehicle while sampling, GPS error margin, and availability of road access within very small test tiles. A related consideration is the time, resources, and cost involved in testing very large numbers of very small tiles. For a given defined test area, all test tiles must be of equal size. The maximum test tile size is 2 by 2 km (1.24 by 1.24 miles) [TSB-88.3-F, §5.5.1]. In some wide-area systems, this constraint on maximum tile size may dictate a greater number of test tiles than the minimum number required by the Estimate of Proportions formula.

No acceptance testing will be performed in locations outside the defined test area as indicated on the Motorola Solutions-provided maps. Motorola Solutions and the City of Fort Lauderdale may agree to perform “information only” tests in locations outside the defined test area; however, these “information only” test results will not be used for coverage acceptance. Any “information only” test locations must be defined before starting the test. If the added locations require significant additional time and resources to test, a change order will be required and Motorola Solutions may charge the City of Fort Lauderdale on a time-and-materials basis.

Accessibility to Test Tiles

Prior to testing, Motorola Solutions and the City of Fort Lauderdale will plan the route for the test vehicle(s) through the defined test area, to ensure that at least the minimum required number of tiles is tested. While planning the route (if possible) or during the test, Motorola Solutions and the City of Fort Lauderdale will identify any test tiles that are inaccessible for the coverage test (due to lack of roads, restricted land, etc.). Inaccessible tiles will be eliminated from the acceptance test calculation. [TSB-88.3-F, §5.5.4]

If elimination of inaccessible test tiles results in less than a statistically significant number of test tiles or substantially alters the defined test area, Motorola Solutions reserves the right to adjust the committed reliability based on the reduced number of accessible test tiles within the altered test area and the Estimate of Proportions formula. [TSB-88.3-F, §5.2.1, equation 2]

Random Selection of a Test Location in Each Tile

This CATP provides an objective method of randomly selecting and tracking test locations using Motorola Solutions’ Voyager℠ coverage testing tool. The method follows TIA TSB-88.3-F §5.0, “Performance Confirmation”, and has direct correlation with Motorola Solutions’ coverage prediction methodology.

Using Voyager, the actual test location within each test tile will be randomly selected by the test vehicle crossing into the tile at an arbitrary point, with an arbitrary speed and direction. If the selected test location is in a shielded area such as a tunnel or underground parking garage, the data from that test location must be eliminated and a replacement test location must be used.

CPC Measurements in Each Tile

For Outbound BER testing, in each test tile, a series of sequential subsample measurements will be made while the test vehicle is moving at a typical speed for the surrounding environment. This test tile

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measurement, containing a number of subsamples, constitutes the test sample for this location. The test sample will establish the mean BER within the test tile. The BER subsamples will typically be measured for at least 1 second. A mean of multiple BER subsamples is used rather than a single measurement to ensure that the measurement is not biased by taking a single sample that might be at a peak or null point on the radio wave.

For Inbound BER testing, complementary timing profiles will be used by Voyager and the Voyager Fixed Network application, VFNE-2, to interleave the inbound and outbound testing. VFNE-2 will be used to gather inbound test statistics. The mobile application, Voyager, will gather outbound test statistics and will send an inbound test pattern to VFNE-2.

For Subjective DAQ testing, in each test tile, a voice test exchange will be initiated using predetermined text typical of a common voice exchange between the fixed location and the test tile location. The person conducting the test at the portable will be moving at a typical speed for the surrounding conditions.

Waiving of Tests

A passing portable test shall imply that a mobile test for the same service area and reliability level shall also be deemed to have passed, thereby allowing the actual mobile test to be waived. This is because the required attenuation level is higher for the portable test, and the test configuration for the mobile test is otherwise identical.

The City shall also have the right to waive any other test or portion thereof, if it so chooses. Any test that is waived in whole or part by the City, shall be deemed to have passed.

Responsibilities and Preparation

This section identifies the responsibilities of the City of Fort Lauderdale and Motorola Solutions regarding requirements for equipment, personnel, and time during the coverage test.

The City of Fort Lauderdale will provide the following for the duration of the coverage test:

Exclusive use of the test channels required by Motorola Solutions during the test.

Four teams each with three or more representatives designated by the City per team to evaluate and record the pass/fail result of each subjective audio transmission. The required quantity of test participants shall be available a minimum of eight hours a day.

Facility with two consoles for the fixed end subjective audio test.

Motorola Solutions will provide the following for the duration of the coverage test:

At least one test vehicle and driver(s).

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Four teams each with one fewer Motorola Solutions representative per team than those designated by the City, to navigate and to operate Voyager, operate the portable radio, and to evaluate and record the pass/fail result of each subjective audio transmission.

One or more Motorola Solutions representatives to operate the fixed equipment, and to evaluate and record the pass/fail result of each subjective audio transmission.

At least one Motorola Solutions Voyager coverage testing tool.

One or more computers equipped with Motorola Solutions VFNE-2 software, and connected to the radio network for collecting inbound signal statistics.

A timing profile to allow the test radio to transmit and receive at regular intervals will be established to facilitate automatic inbound and outbound BER statistics gathering.

User radio(s) for the test.

As required, Motorola Solutions will provide a receiver signal strength calibration file for the test radio(s) used with the Voyager coverage testing tool.

Before starting the test, the City of Fort Lauderdale and Motorola Solutions will agree upon the time frame for Motorola Solutions' submission of a report containing the coverage test results.

CATP Procedures

A coverage acceptance test will be performed using Motorola Solutions' Voyager tool to randomly select test locations, and to manage BER data collection.

Voyager consists of the following:

A voice test radio connected to an antenna installed in the appropriate location on the test vehicle. The test radio will monitor transmissions from the fixed network radio site(s).

A Global Positioning System (GPS) receiver, which will provide the computer with the location and speed of the test vehicle.

A laptop computer with Voyager software and a mapping database, which includes highways and local streets, political boundaries, rivers, and railroads.

A computer with the Voyager Fixed Network (VFNE-2) application, connected to the system network to retrieve inbound BER statistics and to initiate the outbound test pattern.

The procedure for the objective BER coverage test will be as follows:

The Voyager tool will be installed in a test vehicle, which will be driven over a route planned to cover the accessible tiles within the defined test area.

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During the coverage test, the laptop computer screen will display the vehicle's location on a map of the defined test area overlaid with the grid of test tiles. Voyager will automatically initiate outbound measurements and inbound transmissions based on the defined timing profile. The computer will provide a visual indication that a measurement has been completed. Voyager will manage the coverage test data collection, and will store the outbound measurements for each tested tile for later analysis. Voyager will use the information collected by the VFNE-2 fixed end application for the inbound tests. Voyager will use its merge and export feature to match the inbound measurements to a test tile and display the BER statistics.

Any tile that fails the objective BER test described above will be re-tested using a subjective DAQ test. Any tile that fails the objective BER test, but passes the subjective DAQ re-test will be declared passed.

The procedure for the subjective DAQ re-test of failed BER tiles (if needed) will be as follows:

A subjective listening re-test will be performed on tiles that fail the objective BER test, to verify undefined DAQ performance of those tiles.

Talk-out and talk-in will be evaluated independently

To perform a statistically valid subjective DAQ test, a large group of people is required to ensure high confidence in the results. However, obtaining a large group of people for a subjective listening test is usually impractical; therefore, several (three to seven) people in a car or van must be used for the test. Since a group this small cannot provide statistically significant results, it is very important that the personnel participating in the subjective test be familiar with the sound of radio conversations. Before subjectively testing, all personnel who will evaluate audio quality must be "calibrated" by listening to examples of audio that pass and fail the subjective DAQ test.

A fixed dispatch location will be established.

Prior to testing, the City of Fort Lauderdale and Motorola Solutions will agree upon a procedure and audio source to allow each audio transmission to be evaluated for approximately five seconds. For example, the audio source might be trivia questions written by the team, live or recorded dispatch traffic, books on CD, etc. The source should be something that can be easily understood such that the context or content of the audio doesn't cause confusion due to the listener not understanding the meaning.

The test participants will be divided into teams, each consisting of personnel from both the City of Fort Lauderdale and Motorola Solutions. Each team will have members that operate a portable radio in the field, and members that are stationed at the fixed dispatch location.

As the field test team(s) drive through the coverage area, test locations within each re-test tile will be selected randomly by Voyager's GPS location indication. Voyager will be used to log the talk-in and talk-out pass/fail result as well as any pertinent notes for the location.

At each re-test tile location, each field test team member will listen to a talk-out audio transmission, and will record his or her subjective pass/fail evaluation of the DAQ for the tile. Team members stationed at the dispatch location will evaluate talk-in audio quality of transmissions from the test radio(s) in that tile. Each team member will maintain a test log to record date, time, and subjective pass/fail evaluation for each re-test tile location. Subjective pass/fail evaluation will be based on the DAQ descriptions in Table

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1-1: DAQ Definitions. The determination of whether each re-test tile passes or fails the required DAQ value will be the majority vote of all team members' pass/fail subjective evaluations for that tile. An odd number of team members are required to avoid ties for the pass/fail majority vote.

The procedure for the subjective DAQ coverage test will be as follows:

A subjective listening test will be performed for coverage acceptance testing, to verify DAQ performance of the system.

Talk-out and talk-in will be evaluated independently.

To perform a statistically valid subjective DAQ test, a large group of people is required to ensure high confidence in the results. However, obtaining a large group of people for a subjective listening test is usually impractical; therefore, several (three to seven) people in a car or van must be used for the test. Since a group this small cannot provide statistically significant results, it is very important that the personnel participating in the subjective test be familiar with the sound of radio conversations. Before subjectively testing, all personnel who will evaluate audio quality must be "calibrated" by listening to examples of audio that pass and fail the subjective DAQ test.

A fixed dispatch location will be established.

Prior to testing, the City of Fort Lauderdale and Motorola Solutions will agree upon a procedure and audio source to allow each audio transmission to be evaluated for approximately five seconds. For example, the audio source might be trivia questions written by the team, live or recorded dispatch traffic, books on CD, etc. The source should be something that can be easily understood such that the context or content of the audio doesn't cause confusion due to the listener not understanding the meaning.

The test participants will be divided into teams, each consisting of personnel from both the City of Fort Lauderdale and Motorola Solutions. Each team will have members that operate a portable radio in the field, and members that are stationed at the fixed dispatch location.

As the field test team(s) drive through the coverage area, test locations within each test tile will be selected randomly by Voyager's GPS location indication. Voyager will be used to log the talk-in and talk-out pass/fail result as well as any pertinent notes for the location.

At each test tile location, each field test team member will listen to a talk-out audio transmission, and will record his or her subjective pass/fail evaluation of the DAQ for the tile. Team members stationed at the dispatch location will evaluate talk-in audio quality of transmissions from the test radio(s) in that tile. Each team member will maintain a test log to record date, time, and subjective pass/fail evaluation for each test tile location. Subjective pass/fail evaluation will be based on the DAQ descriptions in **Error! Hyperlink reference not valid.**. The determination of whether each test tile passes or fails the required DAQ value will be the majority vote of all team members' pass/fail subjective evaluations for that tile. An odd number of team members is required to avoid ties for the pass/fail majority vote.

Should any subjective DAQ test tile fail, a retry of the transmission will occur. Should the retry pass, the test tile will be considered a pass. If a retry should occur, it will be noted in the test log notes for that test tile.

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The procedure for the subjective DAQ coverage test inside the specific buildings listed in Table 1-4 of this CATP document will be as follows:

A subjective listening test will be performed for coverage acceptance testing, to verify talk-out and talk-in DAQ performance of the system.

Talk-out and talk-in will be evaluated independently.

To perform a statistically valid subjective DAQ test, a large group of people is required to ensure high confidence in the results. However, obtaining a large group of people for a subjective listening test is usually impractical; therefore, several (three to five) people must be used for the test. Since a group this small cannot provide statistically significant results, it is very important that the personnel participating in the subjective test be familiar with the sound of radio conversations. Before subjectively testing, all personnel who will evaluate audio quality must be “calibrated” by listening to examples of audio that pass and fail the subjective DAQ test.

A fixed dispatch location will be established. Prior to testing, the City of Fort Lauderdale and Motorola Solutions will agree upon a procedure to allow each audio transmission to be evaluated for approximately five seconds.

The test participants will be divided into teams, each consisting of personnel from both the City of Fort Lauderdale and Motorola Solutions. Each team will have members that operate a portable radio in the field, and members that are stationed at the fixed dispatch location.

For each test point within the building, a moving test will be conducted by walking in a circle, approximately 1 meter in diameter. Each field test team member will listen to a talk-out audio transmission, and will record his or her subjective pass/fail evaluation of the DAQ for that test point. Short pre-planned test messages will be used. Each team member stationed at the dispatch location will listen to a talk-in audio transmission from the test radio at that test point, and will record his or her subjective pass/fail evaluation of the DAQ for that test point.

Each team member will maintain a test log to record building address, date, time, location within the building, and subjective pass/fail evaluation for each test point within the building. Subjective pass/fail evaluation will be based on the DAQ Definitions in Table 1-1.

The determination of whether each test point within the building passes or fails the required DAQ value will be the majority vote of all team members’ pass/fail subjective evaluations for that test point. An odd number of team members is required to avoid ties for the pass/fail majority vote.

Should any subjective DAQ test point initially fail, a retry of the transmission will occur while moving. If a retry should occur, it will be noted in the test log notes for that test point. Should the retry pass, the test point will be considered a pass.

Each specific building will be tested using the in-building test method below:

In buildings with accessible floor space less than 40,000 square feet on a level, a minimum of 20 test points on each floor will be evenly spaced as much as possible, and will include test points near each of the furthermost accessible locations in the northern, southern, western and eastern portions of the floor

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and several test points near the center of the floor. All test locations will be above ground level and elevators will be excluded from testing.

In buildings with accessible floor space of 40,000 square feet or greater on a level, testing will be performed as described above but test points will be added so that they are spaced approximately 50 feet from adjacent test points, as much as is practical.

In all cases, each building's lowest floor that is completely above ground level will be tested first. If at least the required percentage of test points pass (e.g. 19 of 20 for a 95% requirement), then this particular building is considered to have passed. If the test points on the lowest floor fail to meet the required percentage, then the remaining upper floors of the building, or a subset thereof mutually agreed upon by Motorola Solutions and the City of Fort Lauderdale, will be tested as necessary using the method described here.

A minimum of 100 test points per building and all above ground floors will be tested before any building is declared to have failed. (If necessary to reach 100 points, additional tests will be performed at evenly spaced test points.) If at any time, it becomes obvious to the test team that the building is well covered, the test team may reach a consensus and declare the building as passed without performing additional testing.

Teams will record both the talk-in and talk-out test results for each individual test point. Initial results for all test points will be compiled and recorded at the end of a particular building test. These recorded results will be provided to the Motorola Lead Engineer at the conclusion of testing.

If the proportion of passed test points within a specific building meets or exceeds the Reliability criterion per Table 1-2 Coverage Acceptance Test Summary, the building is considered a pass.

If a specific building fails a subjective DAQ test, Motorola Solutions will use the method outlined below to measure building loss at failed test points to determine if those points exceed the committed building loss.

If a specific building fails more than the allowed percentage of test points (after allowed retries), then for each failed test point, the building attenuation between the nearby exterior (outdoor) location and the failed test point will be measured.

This measurement may use a test transmitter or other methodology to be agreed between Motorola Solutions and the City of Fort Lauderdale, such as measuring the signals from an existing radio system, both outdoors and indoors, and subtracting the difference.

Any existing BDA or DAS in use in the subject building shall be deactivated for the purposes of this building attenuation measurement, unless it can be determined that the BDA or DAS is not influencing the results of the measurement.

If the measured building attenuation to any test point is higher than the committed building loss stated in Table 1-2 Coverage Acceptance Test Summary, then that test point will be excluded from the pass/fail calculations for that building.

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If the proportion of passed test points within a specific building (after excluding test points with excessive building attenuation) meets or exceeds the Reliability criterion per Table 1-2 Coverage Acceptance Test Summary, the building is considered a pass.

If a specific building fails a subjective DAQ test, Motorola Solutions will work with the City of Fort Lauderdale to provide the required coverage reliability in that building.

After working with the customer to remediate the failed building coverage, the testing will be repeated for the remediated specific buildings.

CATP Documentation and Coverage Acceptance

During the coverage acceptance test, the Voyager computer(s) generate comma separated value (.CSV) files that include the coverage test data. A copy of the .CSV files will be provided to the City of Fort Lauderdale at the conclusion of the coverage test. Motorola Solutions will process this data to produce a map detailing the coverage test results, and to determine whether the coverage test was passed for each user equipment configuration.

The coverage acceptance criterion for a user equipment configuration will be that the voice radio system implemented by Motorola Solutions for the City of Fort Lauderdale meets or exceeds the reliability stated in Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary for that user equipment configuration. The system coverage acceptance criterion will be the successful passing of each of the user equipment configurations defined in Table 1-2: City of Fort Lauderdale Coverage Acceptance Test Summary.

Motorola Solutions reserves the right to review any test tiles that fail. Any tile that fails the objective BER or subjective DAQ initial test may be re-tested using a subjective DAQ test. Any tile that fails the objective BER test or subjective DAQ initial test, but passes a subjective DAQ re-test will be declared passed. If a coverage test, or a portion thereof, is suspected by Motorola Solutions to have failed due to external interference, those tiles suspected of being affected by an interferer may be re-tested. If the test tiles re-tested are confirmed to have failed due to interference or external noise, those test tiles will be excluded from all acceptance calculations and Motorola Solutions will work with the City of Fort Lauderdale to identify potential solutions to the interference issues.

Motorola Solutions will conduct this Coverage Acceptance Test only once. If any portion of the test is determined to be affected by proven equipment malfunctions or failures, Motorola Solutions will repeat the portion of the test affected by the equipment malfunction or failure. The City of Fort Lauderdale will have the option to accept the coverage at any time prior to completion of the coverage test or documentation process.

Motorola Solutions will submit to the City of Fort Lauderdale a report detailing the coverage test results. This report will include a document, which is to be signed by both the City of Fort Lauderdale and Motorola Solutions, indicating the test was performed in accordance with this CATP and the results of the test indicate the acceptance or non-acceptance of the coverage portion of the system.

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Section 2

RFP Section 3.1.14.2.D Functional Acceptance Test Plan

Sample Staging Test Plan

The following is a sample Functional Acceptance Test Plan provided to show a subset of the variety of tests that will be used to demonstrate the features provided to the City of Fort Lauderdale with the proposed ASTRO 25 system. The actual ATP will be mutually agreed upon between the City of Fort Lauderdale and Motorola Solutions and updated after the final design has been agreed to.

Sample Acceptance Test Plan, City of Fort Lauderdale, ASTRO 25 Draft

Wide Area Trunking FDMA/TDMA Mixed Sites

Talkgroup Call

1. DESCRIPTION	2. TEST
The Talkgroup is the primary level of organization for communications on a trunked radio system. Radios with Talkgroup call capability will be able to communicate with other members of the same Talkgroup. This provides the effect of a private channel down to the Talkgroup level. This test will demonstrate that a Talkgroup transmission initiated by a radio user will only be heard by system users, which have, the same Talkgroup selected. As with other types of calls, Talkgroup calls can take place from anywhere in the system. SETUP RADIO-1 - SITE 1 - TALKGROUP 1 RADIO-2 - SITE 1 - TALKGROUP 1 RADIO-3 - SITE 1 - TALKGROUP 2 RADIO-4 - SITE 1 - TALKGROUP 2 VERSION #1.040	Step 1. Initiate a Wide Area Call with RADIO-1 in TALKGROUP 1. Step 2. Observe that only RADIO-2 will be able to monitor and respond to the call. Step 3. Initiate a Wide Area Call with RADIO-3 in TALKGROUP 2. Step 4. Observe that only RADIO-4 will be able to monitor and respond the call. Pass_____ Fail_____

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Secure Operation

1. DESCRIPTION	2. TEST
Digital encryption is used to scramble a transmission so only properly equipped and configured radios can monitor the conversation. A "Key" is used to encrypt the transmit audio. Only radios with the same "Key" can decrypt the audio and listen to it. SETUP RADIO-1 - TALKGROUP 1 (SECURE TX MODE) RADIO-2 - TALKGROUP 1 (SECURE TX MODE) RADIO-3 - TALKGROUP 1 (SECURE MODE and no, or incorrect key) RADIO-4 - TALKGROUP 1 (Clear TX Mode) Note: The identical secure mode must be programmed into RADIO-1, RADIO-2, RADIO-4 and that RADIO-3 has no secure code loaded or has a unique secure code from the other testing radios. VERSION #1.020	Step 1. Initiate a secure wide area call with RADIO-1 on TALKGROUP 1. Keep this call in progress until instructed to end the call. Step 2. Observe that RADIO-2 will be able to monitor the call. Step 3. Observe that RADIO-3 does not receive the call. Step 4. Observe that RADIO-4 will also receive the call even with the secure switch set to the non-secure mode of operation. Step 5. End the call from RADIO-1. Step 6. Respond with RADIO-2 and verify that RADIO-1 receives the response audio but RADIO-3 cannot. Pass_____ Fail_____

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Dynamic FDMA/TDMA Talkgroup Call Mode Change

1. DESCRIPTION	2. TEST
The Talkgroup is the primary level of organization for communications on a trunked radio system. Radios with Talkgroup Call capability will be able to communicate with other members of the same Talkgroup. This provides the effect of a private channel down to the Talkgroup level. The FDMA/TDMA mode of the call depends on Talkgroup programming, the capabilities of radios registered to the talkgroup and the capabilities of the sites at which they are registered. The FDMA/TDMA mode of a "Dynamic" Talkgroup call depends on the capabilities of the radios registered to the Talkgroup. A TDMA to FDMA mode change is preceded by transmission trunking. A call in the FDMA mode remains in that mode until the call drops. An FDMA call will not be transmission trunked and changed to a TDMA call. Note: The FDMA/TDMA mode of a call can not change during a PTT. TALKGROUP 1 and TALKGROUP 2 are programmed for "Dynamic". SITE 1 and SITE 1 must be TDMA capable. SETUP RADIO-1 (TDMA) - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 (TDMA) - TALKGROUP 1 RADIO-2 - SITE - SITE 1 RADIO-3 (TDMA) - TALKGROUP 2 RADIO-3 - SITE - SITE 1 RADIO-8 (FDMA-only) - TALKGROUP 1 RADIO-8 - SITE - SITE 1 VERSION #1.010	Step 1. Turn off RADIO-8. Step 2. Initiate a wide area call with RADIO-1 on TALKGROUP 1. Keep the call in progress until instructed to end it. Step 3. Observe that only RADIO-2 will be able to monitor and respond to the call. Observe that the channel is assigned in the TDMA mode since there are no FDMA-only radios in the call. Step 4. Turn on RADIO-8. Note that RADIO-8 cannot hear the call which is still in the TDMA mode. Step 5. Dekey RADIO-1. Observe that the channel dekeys immediately. Step 6. Initiate a wide area call with RADIO-1 on TALKGROUP 1. Keep the call in progress until instructed to end it. Step 7. Observe that both RADIO-2 and RADIO-8 will now be able to monitor and respond to the call. Observe that the channel is now assigned in the FDMA mode. Step 8. Turn off RADIO-8. Step 9. Dekey RADIO-1 and have RADIO-2 initiate the call during the hangtime. Observe that the channel is still assigned in the FDMA mode. Pass_____ Fail_____

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Continuous Assignment Updating

1. DESCRIPTION	2. TEST
When a talkgroup is assigned a voice channel, the site controller continues to transmit the channel assignment on the control channel for the duration of the talkgroup call. Radios coming into use on the system are automatically sent to voice channels with conversations in progress involving their selected talkgroups. SETUP RADIO-1 - TALKGROUP 1 RADIO-2 - TALKGROUP 1 RADIO-3 - TALKGROUP 1 VERSION #1.010	Step 1. Turn OFF RADIO-1. Step 2. Initiate a Talkgroup Call using RADIO-2 and verify RADIO-3 hears the audio. Step 3. While the Talkgroup Call is in progress, turn ON RADIO-1. Step 4. Observe RADIO-1, which was just brought back into service, joins the Talkgroup Call already in progress. Step 5. End the talkgroup call. Step 6. Switch RADIO-1 to another talkgroup. Step 7. Initiate a Talkgroup Call from RADIO-2 to RADIO-3. Step 8. While the Talkgroup Call is in progress, set RADIO-1 back to TALKGROUP 1. Step 9. Observe that RADIO-1 joins the Talkgroup Call already in progress. Pass_____ Fail_____

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Call Alert

1. DESCRIPTION	2. TEST
Call Alert is a tone page that allows a user to selectively alert another radio unit. The initiating radio will receive notification from the trunked system as to whether or not the page was received by the target radio. Units receiving a Call Alert will sound an alert tone. As with other types of calls, Call Alerts can take place from anywhere in the system. SETUP RADIO-1 - TALKGROUP 1 RADIO-2 - TALKGROUP 2 RADIO-3 - TALKGROUP 3 VERSION #1.010	Step 1. Using RADIO-1, press the page button. Step 2. Enter the unit ID of RADIO-2 with the keypad, or scroll to the location where this ID is stored Step 3. Press the PTT to initiate the call alert. Verify that the RADIO-1 user receives audible indication that the Call Alert was sent. Step 4. Verify that RADIO-2 user receives an audible indication of an incoming Call Alert was sent but RADIO-3 does not. Step 5. Verify RADIO-1 gets an audible indication that the Call Alert was successfully received at the target radio. Step 6. Turn off RADIO-2. Send a Call Alert from RADIO-1 to RADIO-2. Step 7. Verify that the RADIO-1 user receives audible indication that the Call Alert was sent. Step 8. Verify RADIO-1 receives a "No Acknowledgement" indication that the Call Alert was not received at the target radio. Pass_____ Fail_____

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Multigroup Call in Wait Mode

1. DESCRIPTION	2. TEST
This trunking feature allows an equipped radio user to transmit an announcement to several different talkgroups simultaneously. The multigroup (ATG) call can be flagged for Wait Mode in the Provisioning Manager (PM) database forcing all attached talkgroups to finish calls in progress before the trunked system will process the multigroup call. The system does not permit inactive, attached talkgroups to initiate Talkgroup Calls during the "wait" timeframe. As with other types of calls, multigroup calls can take place from anywhere in the system. SETUP RADIO-1 - TALKGROUP 1 RADIO- 2 - TALKGROUP 2 RADIO-3 - RANDOM (Not part of MG) RADIO-4 - ATG 1 * TALKGROUP 1 and TALKGROUP 2 are members of ATG 1. * RANDOM is any talkgroup not a member of ATG 1. * Multigroups are set up through both the Provisioning Manager (PM) and the Subscriber Programming software. VERSION #1.020	Step 1. Verify ATG 1 is set for the Wait mode. Step 2. Using RADIO-1, initiate a call on TALKGROUP 1. Step 3. While RADIO-1 is keyed, attempt to initiate a multigroup call using RADIO-4 on ATG 1. Verify RADIO-4 receives a busy tone because one of the talkgroups attached to ATG 1 is involved in a Talkgroup Call. Step 4. Key RADIO-2 and verify that a busy tone is received because the ATG 1 call is in queue. Step 5. Dekey RADIO-1 and verify RADIO-4 receives a callback. Step 6. Key RADIO-4 and verify both RADIO-1 and RADIO-2 hear the multigroup call while RADIO-3 does not unmute. Pass_____ Fail_____

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Multigroup Call in Interrupt Mode

1. DESCRIPTION	2. TEST
This trunking feature allows an equipped radio user to transmit an announcement to several different talkgroups simultaneously. When the multigroup (MG) is flagged for Interrupt Mode the trunked system does not wait for attached talkgroups to finish calls in progress. Upon dekeying, the interrupted radios will join the multigroup call in progress. As with other types of calls, multigroup calls can take place from anywhere in the system. NOTE: A receiver interference failure may appear if RADIO-1 is not immediately dekeyed. This test is not recommended for single site systems as RF contention will occur. SETUP RADIO-1 - TALKGROUP 3 RADIO- 1 - SITE - SITE 1 RADIO-2 - TALKGROUP 4 RADIO- 2 - SITE - SITE 1 RADIO-3 - RANDOM (Not part of MG) RADIO-3 - SITE - SITE 1 RADIO-4 - ATG 2 RADIO-4 - SITE - SITE 1 * TALKGROUP 3 and TALKGROUP 4 are members of ATG 2. * RANDOM is any talkgroup not a member of ATG 2. VERSION #1.010	Step 1. Verify ATG 2 is set for the Interrupt mode. Step 2. Using RADIO-1, initiate a call on TALKGROUP 3. Step 3. While RADIO-1 is keyed, initiate a multigroup call using RADIO-4 on ATG 2. Verify RADIO-2 receives the call but RADIO-3 does not unmute. Step 4. Dekey RADIO-1 and verify RADIO-1 unmutes and joins the multigroup call in progress. Pass_____ Fail_____

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Dynamic FDMA/TDMA Multigroup Call

1. DESCRIPTION	2. TEST
This trunking feature allows an equipped radio user to transmit an announcement to several different talkgroups simultaneously. As with other types of calls, multigroup calls can take place from anywhere in the system. A Dynamic multigroup can contain FDMA-only, TDMA-only and Dynamic talkgroups. The FDMA/TDMA mode of a "Dynamic" multigroup will be determined by the capabilities of the radios affiliated to the talkgroups and multigroup and the capabilities of the sites where the radios are affiliated. Note: TALKGROUP 1, TALKGROUP 2 are members of ATG 1 and programmed as "Dynamic". SITE 1 and SITE 1 must be TDMA capable. ATG 1 is programmed as Dynamic. SETUP RADIO-1 (TDMA) - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 (TDMA) - TALKGROUP 2 RADIO-2 - SITE - SITE 1 RADIO-4 (TDMA) - ATG 1 RADIO-4 - SITE - SITE 1 RADIO-8 (FDMA-only) - TALKGROUP 2 RADIO-8 - SITE - SITE 1 VERSION #1.010	Step 1. Turn off RADIO-8. Step 2. Using RADIO-4, initiate a call on ATG 1. Step 3. Observe that RADIO-1 and RADIO-2 can monitor the call. Observe that the channel is assigned in the TDMA mode since there are no FDMA radios affiliated to either talkgroup. Step 4. Dekey RADIO-4 and turn on RADIO- 8. Step 5. Using RADIO-4, initiate a call on ATG 1. Step 6. Observe that RADIO-1, RADIO-2 and RADIO- 8 can monitor the call. Observe that the channel is now assigned in the FDMA mode. Pass_____ Fail_____

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Dynamic FDMA/TDMA Busy Queue Conversion

1. DESCRIPTION	2. TEST
If no voice channel resources are available, radios requesting channels for new conversations are placed in a queue. Users of the same priority will move through the queue in a FIFO (first in, first out) sequence. When a voice channel becomes available, the radio at the top of the busy queue gets a channel assignment and generates a callback tone if the FDMA/TDMA mode of the call can be supported by the available resource. While the call is waiting in the busy queue, the FDMA/TDMA mode of a talkgroup at a site in site trunking can be change as radios join or leave the talkgroup. NOTE: All radios and talkgroups should start with default priorities. The Default is 10. SETUP RADIO-1 (TDMA) - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 (TDMA) - TALKGROUP 1 RADIO-2 - SITE - SITE 1 RADIO-8 (FDMA-only) - TALKGROUP 2 RADIO-8 - SITE - SITE 1 RADIO-9 (FDMA-only) - TALKGROUP 2 RADIO-9 - SITE - SITE 1 VERSION #1.010	Step 1. Simulate a busy system by disabling all channels at SITE 1 with the exception of the control channel and one voice channel. Step 2. Initiate a TALKGROUP 2 call using RADIO-9. Verify RADIO-8 receives the call. Keep the call in progress until instructed to end it. Observe that the channel is assigned in the FDMA mode. Step 3. Initiate a TALKGROUP 1 call using RADIO-1 and observe that the radio receives a busy. Step 4. Dekey RADIO-9 and observe that RADIO-1 receives a callback and can make the call. Observe that the channel is assigned in the TDMA mode since there are no FDMA-only radios in the call. Step 5. Initiate a TALKGROUP 2 call using RADIO-9 and observe that the radio receives a busy. Step 6. Dekey RADIO-1 and observe that RADIO-9 receives a callback and can make the call. Observe that the channel is assigned in the FDMA mode. Pass_____ Fail

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Dynamic FDMA/TDMA Busy Queuing and Callback with 10 Talkgroup Priority Levels

1. DESCRIPTION	2. TEST
If no voice channel resources are available, radios requesting channels for new conversations are placed in a queue. Users of the same priority will move through the queue in a first in, first out sequence; however, users of higher priority will be inserted ahead of lower priority users in queue. When a voice channel becomes available, the radio at the top of the busy queue gets a channel assignment and generates a callback tone if the FDMA/TDMA mode of the call can be supported by the available resource. Otherwise, the first call in the queue that can use the available resource gets assigned. The callback tone alerts the user that a channel assignment was made and transmitting is now possible on the selected talkgroup. In this test case, the available resource cannot support the FDMA call mode. NOTE: An Emergency Call has the highest priority at level 1. The highest assignable priority is 2 and 10 is the lowest. All radios and talkgroups should start with default priorities. The default is 10. SITE 1 must be TDMA capable. SETUP RADIO-1 (TDMA) - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 (TDMA) - TALKGROUP 2 RADIO-2 - SITE - SITE 1 RADIO-4 (TDMA) - TALKGROUP 4 RADIO-4 - SITE - SITE 1 RADIO-8 (FDMA-only) - TALKGROUP 6 RADIO-8 - SITE - SITE 1 Note: TALKGROUP 1, TALKGROUP 2 and TALKGROUP 6 are programmed for "Dynamic". VERSION #1.020	Step 1. Simulate a busy system by disabling all channels at SITE 1 with the exception of the control channel and one voice channel. Step 2. Verify the priority level for TALKGROUP 6's template is configured as priority 9. Step 3. Initiate Talkgroup Calls with RADIO-1 and with RADIO-2. Keep these calls in progress until instructed to end them. Both calls are assigned in the TDMA mode to the single voice channel. Step 4. Key RADIO-8 and observe that the radio receives a busy. Step 5. Key RADIO-4 and observe that the radio receives a busy. Step 6. End the call on RADIO-1. Step 7. Observe RADIO-4 receives the first callback and can now make a call because the available resource can not support an FDMA call. Step 8. End the calls on RADIO-2 and RADIO-4. Step 9. Observe RADIO-8 now receives a callback and can make a call upon receipt of the callback indication since there is now a FDMA channel available. Pass_____ Fail_____

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Dynamic FDMA/TDMA Emergency Alarm and Call with Top of Queue - FDMA Call in Queue

1. DESCRIPTION	2. TEST
Users in life threatening situations can use the Emergency button on the radio to immediately send a signal to the dispatcher and be assigned the next available voice channel if the FDMA/TDMA mode of the call can be supported by the available resource. Otherwise, the first call in the queue that can use the available resource gets assigned. An Emergency Call can be set to either Top of Queue or Ruthless Preemption operation. To accomplish this, an Emergency Alarm and Call will be initiated from a subscriber which will be received by a subscriber affiliated at any site of any zone in the system. In this case, the first available resource CANNOT support the emergency call mode. NOTE: If the subscriber does not have the Display option, the Emergency ID will not be displayed. All radios and talkgroups should start with default priorities. Default is 10. SITE 1 must be TDMA capable. SETUP RADIO-1 (TDMA) - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 (TDMA) - TALKGROUP 2 RADIO-2 - SITE - SITE 1 RADIO-3 (TDMA) - TALKGROUP 3 RADIO-3 - SITE - SITE 1 RADIO-4 (TDMA) - TALKGROUP 4 RADIO-4 SITE - SITE 1 RADIO-8 (FDMA-only) - TALKGROUP 1 RADIO-8 - SITE - SITE 1 Note: TALKGROUP 1, TALKGROUP 2, TALKGROUP 3 and TALKGROUP 4 are programmed for "Dynamic". VERSION #1.010	Step 1. Verify the emergency type for TALKGROUP 1's template must be set up as Top of Queue. Step 2. Simulate a busy system by disabling all channels at SITE 1 with the exception of the control channel and one voice channel. Step 3. Initiate a call with both RADIO-2 and RADIO-4 and hold the PTT switches until instructed to release. Step 4. Key RADIO-3 and verify the radio receives a busy tone. Release the PTT switch on RADIO-3. Step 5. Using RADIO-1 send an Emergency Call by pressing the emergency switch and then the PTT switch. Observe that RADIO-1 cannot transmit due to the voice channel being busy. Step 6. Release the PTT switch on RADIO-2. Observe that RADIO-3 receives the call back before RADIO-1 and is able to proceed with the call because the available channel resource is already busy with one TDMA call and can only support another TDMA call. Step 7. Dekey RADIO-4 and RADIO-3. Step 8. Observe that RADIO-1 receives the callback and is able to proceed with the call. Step 9. Observe that the display on RADIO-8 denotes an emergency and the unit ID of RADIO-1. Step 10. Dekey RADIO-1 and exit the Emergency mode by holding down the Emergency button on RADIO-1 until an alert tone sounds. Verify RADIO-1 returns to normal operation. Pass_____ Fail_____

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Motorola Solutions

Emergency Alarm and Call with Talkgroup Revert

1. DESCRIPTION	2. TEST
Users in life threatening situations can use the Emergency button on the radio to immediately send a signal to the dispatcher and be assigned the next available voice channel. An Emergency Call can be set to either Top of Queue or Ruthless Preemption operation. During an emergency call the Emergency ID will appear on the display of the subscribers. To demonstrate this, an Emergency Alarm and Call will be initiated from a subscriber which will be received by a subscriber affiliated at any site of any zone in the system. This test will demonstrate a subscriber has the ability to revert to a specific talkgroup when an emergency is initiated. This is useful when the users have a designated talkgroup for handling emergencies. The revert talkgroup must be set in the subscriber via software. NOTE: If the subscriber does not have the Display option, the Emergency ID will not be displayed. SETUP RADIO-1 - TALKGROUP 4 RADIO-2 - TALKGROUP 4 RADIO-3 - EMERGENCY TG * EMERGENCY TG is the talkgroup programmed for emergency reverts. VERSION #1.020	Step 1. Initiate a call on TALKGROUP 4 from RADIO- 1 and verify RADIO-2 can hear the audio. Verify RADIO-3 does not hear the audio. Step 2. Dekey RADIO-1. Step 3. Using RADIO-1, send an Emergency Call by depressing the emergency switch and then the PTT switch. Step 4. Observe the display on RADIO-3 denotes an emergency and the unit ID or alias of the unit sending the emergency and that RADIO-3 can hear RADIO-1's audio. Step 5. In addition observe that RADIO-2 cannot hear RADIO-1's audio. Step 6. Release the PTT switch on RADIO-1 and end the Emergency Call by holding down the Emergency button. Pass_____ Fail_____

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Private Call Management - DDM/TDMA Channel

1. DESCRIPTION	2. TEST
This test demonstrates the capability to limit RF resource usage by private calls on per RF site basis. A limit setting is entered from Unified Network Configurator Wizard (UNCW) and sent to Zone Controller for enforcement. The capability only works on a trunked system and when RF sites are in wide trunking mode. RF site types that support this capability are ISR, IP Simulcast, and Trunked 3600 sites. Note that on a dynamic dual mode (DDM) RF channel, number of RF resources used by a call depends upon the type of the call: FDMA or TDMA. An FDMA call will consume two RF resources while a TDMA call will consume only one RF resources. For demonstration purpose, this test will use DDM channels. Radios will access the DDM channels using TDMA. SETUP A supported RF site (see above) with at least 2 DDM - only channels UNCW RADIO-1 – TALKGROUP 1 RADIO-1 – SITE – SITE 1 RADIO-2 – TALKGROUP 1 RADIO-2 – SITE – SITE 1 RADIO-3 – TALKGROUP 1 RADIO-3 – SITE – SITE 1 RADIO-4 – TALKGROUP 1 RADIO-4 – SITE – SITE 1 VERSION #1.040	Step 1. Use UNCW to set “Maximum Number of Resources for Private Call” to a value of 1. Step 2. RADIO-1 initiates a Private Call to RADIO-2. Step 3. Observe the call is successful, Radio-1 and RADIO-2 can communicate normally. Step 4. While RADIO-1 and RADIO-2 are still in Private call, RADIO-3 tries to initiates another Private Call with RADIO-4. Step 5. Observe the Private Call request by RADIO-3 is busied by the system. Step 6. RADIO-1 and RADIO-2 end their Private Call. Step 7. Observe RADIO-3 received a call back. Initiate a private call with RADIO-4. Step 8. Observe the Private Call between RADIO-3 and RADIO-4 is successful. Pass_____ Fail_____

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Site Access Control/"Individual Only" Site Access Denial

1. DESCRIPTION	2. TEST
The system can be used to limit radio or talkgroup access to selected valid sites. Control can be exercised to restrict radio users or talkgroups to certain sites, or to steer radio activity away from smaller sites in an effort to avoid busies. System flags establish which sites are valid for each individual radio user, talkgroup and multigroup. An overall Site Access Denial flag for the system governs how these radio and talkgroup settings affect the affiliation or rejection of radios to individual sites. Once a subscriber unit has been denied at a site it will not attempt to access that site unless power is cycled or the user changes talkgroups. Four possible values for the Site Access Denial flag exist: Individual Only, Talkgroup Only, Either, or Both. "Individual Only" Site Access Denial dictates that a radio will not be allowed to affiliate to a particular site if the radio user does not have access to that site. If the Site Access Denial flag is set to "Individual Only", the talkgroup record for valid sites is not used in the determination of actual site affiliation permissions. NOTE: Site Denial flags are not cleared from the subscriber until the power is cycled or the talkgroup is changed. SETUP RADIO-1 - TALKGROUP 1 RADIO- 1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO- 2 - SITE - SITE 1 VERSION #1.010	Step 1. Set the Site Access Denial Flag to Individual Only. Verify that the change has completed. Step 2. Cycle power to RADIO-1 and RADIO-2 to force them to affiliate, this will clear any site denials they may hold in memory. Step 3. Initiate a Private Call from RADIO-2 to RADIO-1. Verify that the Private Call occurs since RADIO-2 is valid at SITE 2. End the Private Call. Step 4. Set SITE 2 to be a non-valid site for RADIO-2. Verify that the change has completed. Step 5. Initiate a Private Call from RADIO-2 to RADIO-1. Verify that RADIO-2 receives a reject, (Note: this may happen quickly and not be noticeable if the radio is not site locked. If site locked, the radio will not roam until the site lock is removed.) and roams to a valid site. RADIO-2 is not allowed to make the Private Call from SITE 2 since it is no longer valid at SITE 2. Step 6. Set SITE 2 to be a valid site for RADIO-2. Verify that the change has completed. Step 7. Cycle power to RADIO-1 and RADIO-2 to force them to affiliate, this will clear any site denials they may hold in memory. Step 8. Return the system to the original settings. Pass_____ Fail____

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Motorola Solutions

Site Access Control/"Talkgroup Only" Site Access Denial

1. DESCRIPTION	2. TEST
The system can be configured to limit radio or talkgroup access to selected valid sites. Control can be exercised to restrict radio users or talkgroups to certain sites, or to steer radio activity away from smaller sites in an effort to avoid busies. System flags establish which sites are valid for each individual radio user, talkgroup and multigroup. An overall Site Access Denial flag for the system governs how these radio and talkgroup settings affect the affiliation or rejection of radios to individual sites. Four possible values for the Site Access Denial flag exist: Individual Only, Talkgroup Only, Either, or Both. "Talkgroup (TG) Only" Site Access Denial dictates that a radio will not be allowed to affiliate to a particular site if its affiliated talkgroup does not have access to that site. In this case, the individual radio user setting for valid sites is not used in the determination of actual site affiliation permissions. NOTE: Site Denial flags are not cleared from the subscriber until the power is cycled or the talkgroup is changed. SETUP RADIO-1 - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO-2 - SITE - SITE 1 VERSION #1.020	Step 1. Set the Site Access Denial Flag to Talkgroup Only. Step 2. Verify that the change completed. Step 3. Set SITE 2 to be a valid site for RADIO-2. Set SITE 2 to be a non-valid site for TALKGROUP 1. Step 4. Attempt to force RADIO-2 to scan to SITE 2. Verify that RADIO-2 cannot affiliate to SITE 2 since TALKGROUP 1 is a non-valid talkgroup for SITE 2. Step 5. Set SITE 2 to be a valid site for TALKGROUP 1. Set SITE 2 to be a non-valid site for RADIO-2. Step 6. Cycle the power to RADIO-2 then attempt to force RADIO-2 to scan to SITE 2. Verify that RADIO-2 is now allowed to affiliate to SITE 2 since the talkgroup record determines site access. Step 7. Initiate a call from RADIO-2. Verify that RADIO-2 is allowed to make the call from SITE 2 since TALKGROUP 1 is valid at SITE 2. Also verify that RADIO-1 hears the audio. Step 8. Set SITE 2 to be a valid site for RADIO-2. Return the Site Access Denial Flag to "Both". Pass_____ Fail_____

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Site Trunking FDMA/TDMA Mixed Sites
Site Trunking Indication

1. DESCRIPTION	2. TEST
When a remote site loses its link or does not have a link to the Zone Controller, the affected site will enter "Site Trunking" mode of operation. Radios locked onto this site will be serviced locally within this site's coverage area. NOTE: If the subscriber does not have the Display option, the "Site Trunking" indication will not be displayed. SETUP RADIO-1 - TALKGROUP 1 RADIO- 1 - SITE - SITE 1 RADIO-2 - TALKGROUP 2 RADIO- 2 - SITE - SITE 1 Lock the subscribers to SITE 1 if more than one site exists on the system. VERSION #1.010	Step 1. Place SITE 1 into the Site Trunking mode. Step 2. Verify that RADIO-1 and RADIO-2 are displaying the "Site Trunking" indication. Step 3. Return the site to Wide Area Trunking unless the next test requires Site Trunking. Pass_____ Fail_____

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Talkgroup Call (Single Site)

1. DESCRIPTION	2. TEST
When a site goes into Site Trunking, radios with Talkgroup Call capability will be able to communicate with other members of the same talkgroup at that same site. (Members of the same talkgroup at other sites will not be able to monitor those conversations.) SETUP RADIO-1 - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO-2 - SITE - SITE 1 RADIO-3 - TALKGROUP 2 RADIO-3 - SITE - SITE 1 RADIO-4 - TALKGROUP 2 RADIO-4 - SITE - SITE 1 * All Radios should be "Site Locked" VERSION #1.010	Step 1. Place SITE 1 into the Site Trunking mode. Step 2. Initiate a Talkgroup Call with RADIO-1 on TALKGROUP 1 at SITE 1. Step 3. Observe that only RADIO-2 will be able to monitor and respond to the call. Note that RADIO-3 AND RADIO-4 are not able to monitor the call since they are on another Talkgroup. Step 4. Initiate a Talkgroup Call with RADIO-3 on TALKGROUP 2 at SITE 1. Step 5. Observe that only RADIO-4 will be able to monitor and respond to the call. Step 6. Return the site to Wide Area Trunking unless the next test requires Site Trunking. Pass_____ Fail_____

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Call Alert

1. DESCRIPTION	2. TEST
Call Alert is a tone page that allows a user to selectively alert another radio unit. When a site is in Site Trunking, Radios at the site will only be able to Call Alert other radios at the same site. The initiating radio will receive notification from the trunked system as to whether or not the page was received by the target radio. SETUP RADIO-1 - TALKGROUP 1 RADIO- 1 - SITE - SITE 1 RADIO-2 - TALKGROUP 2 RADIO- 2 - SITE - SITE 1 Note: All Radios should be "Site Locked" VERSION #1.010	Step 1. Place SITE 1 into the Site Trunking mode. Step 2. Using RADIO-1, press the page button. Step 3. Enter the Unit ID of RADIO-2 with the keypad, or scroll to the location where this ID is stored. Step 4. Press the PTT to initiate the Call Alert. Step 5. Verify that RADIO-2 received the Call Alert. Step 6. Exit the Call Alert mode and return to normal talkgroup mode. Step 7. Return the site to Wide Area Trunking unless the next test requires Site Trunking. Pass_____ Fail_____

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Continuous Assignment Updating

1. DESCRIPTION	2. TEST
When a talkgroup is assigned a voice channel, the site controller continues to transmit the channel assignment on the control channel for the duration of the Talkgroup Call. Radios coming into use on the system are automatically sent to voice channels with conversations in progress involving their selected talkgroups. SETUP RADIO-1 - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO-2 - SITE - SITE 1 RADIO-3 - TALKGROUP 1 RADIO-3 - SITE - SITE 1 Note: All Radios should be "Site Locked" VERSION #1.010	Step 1. Place SITE 1 into the Site Trunking mode. Step 2. Turn OFF RADIO-1. Step 3. Initiate a Talkgroup Call using RADIO-2. Step 4. While the Talkgroup Call is in progress, turn on RADIO-1. Step 5. Observe that RADIO-1, which was just brought back into service, joins the Talkgroup Call already in progress. Step 6. Release the PTT of RADIO-2. Switch RADIO- 1 to TALKGROUP 2. Step 7. Initiate a Talkgroup Call using RADIO-2. Step 8. While the Talkgroup Call is in progress, turn RADIO-1 back to TALKGROUP 1. Step 9. Observe that RADIO-1, which was just set back to TALKGROUP 1, joins the Talkgroup Call already in progress. Step 10. Return the site to Wide Area Trunking unless the next test requires Site Trunking. Pass_____ Fail_____

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Dynamic FDMA/TDMA Busy Queue Conversion

1. DESCRIPTION	2. TEST
If no voice channel resources are available, radios requesting channels for new conversations are placed in a queue. Users of the same priority will move through the queue in a first in, first out sequence. When a voice channel becomes available, the radio at the top of the busy queue gets a channel assignment and generates a callback tone if the FDMA/TDMA mode of the call can be supported by the available resource. While the call is waiting in the busy queue, the FDMA/TDMA mode of a talkgroup at a site in site trunking can be change as radios join or leave the talkgroup. NOTE: All radios and talkgroups should start with default priorities. The Default is 10. SETUP RADIO-1 (TDMA) - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-8 (FDMA-only) - TALKGROUP 1 RADIO-8 - SITE - SITE 1 RADIO-9 (FDMA-only) - TALKGROUP 2 RADIO-9 - SITE - SITE 1 VERSION #1.020	Step 1. Place SITE 1 into Site Trunking and simulate a busy system by disabling all channels at SITE 1 with the exception of the control channel and one voice channel. Turn off RADIO-8 Step 2. Initiate a Talkgroup Call with RADIO-9 and keep the call in progress until instructed to end it. Step 3. Key RADIO-1 and observe that the radio receives a busy. Step 4. Dekey RADIO-9 and observe that RADIO-1 receives a callback and can make the call. Observe that the channel is assigned through CSS in the TDMA mode since there are no FDMA-only radios in the call Step 5. Dekey RADIO-1. Step 6. Initiate a Talkgroup Call with RADIO-9 and keep the call in progress until instructed to end it. Step 7. Turn on RADIO-8. Step 8. Key RADIO-1 and observe that the radio receives a busy. Step 9. Dekey RADIO-9 and observe that RADIO-1 receives a callback and can make the call. Observe that the channel is now assigned in the FDMA mode. Step 10. Return the site to Wide Area Trunking unless the next test requires Site Trunking. Pass_____ Fail_____

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Wide Area Recovery

1. DESCRIPTION	2. TEST
A site in Site Trunking will transition to Wide Area Trunking when all failures have been cleared. All subscribers should transition from Site Trunking to Wide Area Trunking and continue to process calls. SETUP RADIO-1 - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO-2 - SITE - SITE 1 RADIO-3 - TALKGROUP 1 RADIO-3 - SITE - SITE 2 RADIO-4 - TALKGROUP 1 RADIO-4 - SITE - SITE 2 CONSOLE-1 - TALKGROUP 1 Note: All Radios should be "Site Locked" VERSION #1.020	Step 1. Set the status of SITE 1 to Wide Area and clear any system errors that may have placed SITE 1 into Site Trunking. Step 2. Verify that the status of SITE 1 has transitioned into Wide Area Trunking. Step 3. Verify that RADIO-1 and RADIO-2 no longer display Site Trunking. Step 4. Verify Wide Area communications between RADIO-1, RADIO-2, RADIO-3, RADIO-4 and CONSOLE-1. Pass_____ Fail_____

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AXS Dispatch
Talkgroup Selection and Call

1. DESCRIPTION	2. TEST
The Talkgroup Call is the primary level of organization for communications on a trunked radio system. Dispatchers with Talkgroup Call capability will be able to communicate with other members of the same talkgroup. This provides the effect of an assigned channel down to the talkgroup level. When a Talkgroup Call is initiated from a subscriber unit, the call is indicated on each dispatch operator position that has a channel control resource associated with the unit's channel/talkgroup. SETUP RADIO-1 - TALKGROUP 1 RADIO-2 - TALKGROUP 2 RADIO-3 - TALKGROUP 1 RADIO-4 - TALKGROUP 2 CONSOLE-1 - TALKGROUP 1 CONSOLE- 2 - TALKGROUP 2 VERSION #1.010	Step 1. Initiate a wide area call from CONSOLE-1 on TALKGROUP 1. Step 2. Observe that RADIO-1 and RADIO-3 will be able to monitor the call. Dekey the console and have either radio respond to the call. Step 3. Observe that all consoles with TALKGROUP 1 can monitor both sides of the conversation. Step 4. Initiate a wide area call from CONSOLE-2 on TALKGROUP 2. Step 5. Observe that RADIO-2 and RADIO-4 will be able to monitor the call. Dekey the console and have either radio respond to the call. Step 6. Observe that all consoles with TALKGROUP 2 can monitor both sides of the conversation. Pass_____ Fail_____

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PTT Unit ID/Alias Display

1. DESCRIPTION	2. TEST
Console operator positions contain various resources such as talkgroup, multigroup, Private Call which enables the dispatcher to communicate with the subscriber units. If activity occurs on one of these operator position resources, the unit ID or associated alias of the initiating radio appears at the console resource. SETUP RADIO-1 - TALKGROUP 1 RADIO-2 - TALKGROUP 1 CONSOLE-1 - TALKGROUP 1 CONSOLE- 2 - TALKGROUP 1 VERSION #1.010	Step 1. Select the resource for TALKGROUP 1 on CONSOLE-1. Step 2. Initiate a call on TALKGROUP 1 from RADIO- 2 and observe that the alias is seen at CONSOLE-1 in the resource window as well as in the Activity Log window. Step 3. Initiate a call from RADIO-1 and observe that the alias of RADIO-1 is seen at CONSOLE-1 in the resource window as well as in the Activity Log window. Step 4. Modify RADIO-2's alias. Make sure to give enough time for the alias change to propagate to the Zone Controller. Step 5. Initiate a call from RADIO-2 and observe the new alias of RADIO-2 is seen at CONSOLE-1 in the list in the resource window as well as in the Activity Log window. Step 6. Return RADIO-2's alias to its original state. Pass Fail_____

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Talkgroup Selection and Call - Secure

1. DESCRIPTION	2. TEST
The Talkgroup Call is the primary level of organization for communications on a trunked radio system. Dispatchers with Talkgroup Call capability will be able to communicate with other members of the same talkgroup. This provides the effect of an assigned channel down to the talkgroup level. When a Talkgroup Call is initiated from a subscriber unit, the call is indicated on each dispatch operator position that has a channel control resource associated with the unit's channel/talkgroup. Digital encryption is used so only properly equipped and configured subscribers can monitor the conversation. A "Key" is used to encrypt the transmit audio. Only radios and Consoles with the same "Key" can decrypt the audio and listen to it. SETUP RADIO-1 - TALKGROUP 1 (Secure TX Mode) RADIO-2 - TALKGROUP 2 (Secure TX Mode) RADIO-3 - TALKGROUP 2 (No Keys) RADIO-4 - TALKGROUP 1 (Clear TX Mode with Keys loaded) CONSOLE-1 - TALKGROUP 1 and TALKGROUP 2 (Secure TX Mode) VERSION #1.040	Step 1. Initiate a wide area secure call from CONSOLE-1 on TALKGROUP 1. Step 2. Verify RADIO-1 can monitor and respond to the secure call. Step 3. Verify RADIO-4 can monitor and respond to the secure call because even though it is in clear mode the correct encryption keys are loaded for the secure call. Step 4. Initiate a wide area secure call from CONSOLE-1 on TALKGROUP 2. Step 5. Verify that RADIO-2 can monitor and respond to the secure call. Note that RADIO-3 cannot monitor the call. Pass_____ Fail_____

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Secure/Clear Cross-Mode Indication

1. DESCRIPTION	2. TEST
This test validates the ability of the console to show a visual indication of a Secure and Clear mode mismatch during the following conditions: 1. Talkgroup on the Console is in secure transmit mode but receiving clear audio. 2. Talkgroup on the Console is in clear transmit mode but receiving secure audio. SETUP RADIO-1 - TALKGROUP 1 (Secure TX mode) CONSOLE-1 - TALKGROUP 1 (Secure TX mode) VERSION #1.010	Step 1. Initiate a secure call on RADIO-1. Step 2. Verify CONSOLE-1 is able to receive audio from RADIO-1. Step 3. Place RADIO-1 in clear TX mode. Step 4. Initiate a call on RADIO- 1. Step 5. Verify CONSOLE-1 is able to receive audio from RADIO-1 and displays a secure mode mismatch indication. Step 6. Place RADIO-1 in secure transmit mode and place CONSOLE-1 in clear transmit mode. Step 7. Initiate a secure call on RADIO-1. Step 8. Verify CONSOLE-1 is able to receive audio from RADIO-1 and displays a secure Cross-Mode Indication. Pass_____ Fail_____

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Multigroup Call

1. DESCRIPTION	2. TEST
This trunking feature allows an equipped console operator position to transmit an announcement to several different talkgroups simultaneously. As with Talkgroup Calls, multigroup calls operate across sites as well as within the same site. SETUP RADIO-1 - TALKGROUP 1 RADIO- 2 - TALKGROUP 2 RADIO-3 - RANDOM CONSOLE-1 - ATG 1 Note: TALKGROUP 1 and TALKGROUP 2 are members of ATG 1. RANDOM is any talkgroup not a member of ATG 1. VERSION #1.010	Step 1. Using CONSOLE-1, select the ATG 1 resource. Step 2. Initiate the Multigroup Call from CONSOLE-1. Step 3. Observe that RADIO-1 and RADIO-2 receive the Multigroup Call. Step 4. Verify that RADIO-3 does not receive the Multigroup Call because it is not a member of ATG 1. Step 5. Answer the Multigroup Call using RADIO-1 and observe CONSOLE-1 receives the response. Step 6. Verify that if the call is answered within the repeater hang time, the console will receive the call on the ATG 1 resource tile, otherwise the console will receive the call on the TALKGROUP 1 tile. Step 7. Verify that if the call is answered within the repeater hang time, RADIO-2 will monitor the call. Pass_____ Fail_____

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Multi-Select Operation

1. DESCRIPTION	2. TEST
Multi-Select (Msel) allows the console operator to group a number of channels/talkgroups together such that when the general transmit bar is depressed, all of the multi-selected channels/talkgroups will transmit at the same time with the same information. Multi-Select is one way communication call. If a radio user responds to a Multi-Select call the talkgroup the user is affiliated to will be the only one to hear the call. There is no super-group formed, so radio communication is still at the single talkgroup level. Multi-Select is utilized to send an APB to several channels/talkgroups. A Multi-Select has a limit of twenty (20) trunking/conventional resources SETUP RADIO-1 - TALKGROUP 1 RADIO- 2 - TALKGROUP 2 CONSOLE-1 - TALKGROUP 1, TALKGROUP 2 VERSION #1.010	Step 1. From CONSOLE-1, create an Msel group with TALKGROUP 1 and TALKGROUP 2. Step 2. Transmit on the Msel using the Msel instant transmit button. Step 3. Verify that RADIO-1 and RADIO-2 hear the call. Step 4. Initiate a call with RADIO-1. Step 5. Verify the call is heard on CONSOLE-1 but not on RADIO-2. Step 6. Initiate a call with RADIO-2. Step 7. Verify the call is heard on CONSOLE-1 but not on RADIO-1. Step 8. On CONSOLE-1 dissolve the Msel. Pass_ Fail_____

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Talkgroup Patch

1. DESCRIPTION	2. TEST
Talkgroup Patch allows a dispatcher to merge several talkgroups together on one voice channel to participate in a single conversation. This can be used for situations involving two or more talkgroups that need to communicate with each other. Using the Patch feature, the console operator can talk and listen to all of the selected talkgroups grouped; in addition, the members of the individual talkgroups can also talk or listen to members of other talkgroups. Patched talkgroups can communicate with the console dispatcher and other members of different talkgroups because of the "supergroup" nature of the Patch feature. NOTE : If "secure" and "clear" resources are patched together, one repeater for each mode may be assigned per site. SETUP RADIO-1 - TALKGROUP 1 RADIO-2 - TALKGROUP 2 RADIO-3 - TALKGROUP 1 RADIO-4 - TALKGROUP 2 CONSOLE-1 - TALKGROUP 1 and TALKGROUP 2 Note: All 4 Radios must have the same home zone. VERSION #1.010	Step 1. Using CONSOLE-1 create a patch between TALKGROUP 1 and TALKGROUP 2. Step 2. Initiate a patch call from CONSOLE-1. Step 3. Verify RADIO-1, RADIO-2, RADIO-3, and RADIO-4 can monitor the call. Step 4. Initiate several calls between the radios and verify successful communication. Step 5. Dissolve the patch created in step 1. Pass___ Fail_____

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Talkgroup Patch - Secure

1. DESCRIPTION	2. TEST
Talkgroup Patch allows a dispatcher to merge several talkgroups together on one voice channel to participate in a single conversation. This can be used for situations involving two or more talkgroups that need to communicate with each other. Using the Patch feature, the console operator can talk and listen to all of the selected talkgroups grouped; in addition, the members of the individual talkgroups can also talk or listen to members of other talkgroups. Patched talkgroups can communicate with the console dispatcher and other members of different talkgroups because of the "supergroup" nature of the Patch feature. SETUP RADIO-1 - TALKGROUP 1 (Secure TX Mode) RADIO-2 - TALKGROUP 2 (Secure TX Mode) RADIO-3 - TALKGROUP 1 (No secure keys loaded) RADIO-4 - TALKGROUP 2 (Clear TX Mode with keys loaded) CONSOLE-1 - TALKGROUP 1 and TALKGROUP 2 (Secure TX Mode) Note: All 4 Radios must have the same home zone. VERSION #1.010	Step 1. Using CONSOLE-1 create a secure patch between TALKGROUP 1 and TALKGROUP 2. Step 2. Initiate a patch call from CONSOLE-1. Step 3. Verify RADIO-1, RADIO-2 and RADIO-4 can monitor the call. Step 4. Initiate a talkgroup call on TALKGROUP 1 from RADIO-1. Step 5. Observe that all radios are able to hear RADIO-1 except RADIO-3. Step 6. Dissolve the patch. Pass_____ Fail_____

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Talkgroup Patch with Conventional

1. DESCRIPTION	2. TEST
Talkgroup Patch allows a dispatcher to merge several talkgroups together on one voice channel to participate in a single conversation. This can be used for situations involving two or more channels or talkgroups that need to communicate with each other. Using the Patch feature, the console operator can talk and listen to all of the selected talkgroups grouped; in addition, the members of the individual channels/talkgroups can also talk or listen to members of other channels/talkgroups. Patched resources can communicate with the console dispatcher and other members of different channels/talkgroups because of the "supergroup" nature of the Patch feature. NOTE : If "secure" and "clear" resources are patched together, one repeater for each mode may be assigned per site. SETUP RADIO-1 - TALKGROUP 1 RADIO-2 - CONVENTIONAL CHANNEL 1 RADIO-3 - TALKGROUP 1 RADIO-4 - CONVENTIONAL CHANNEL 1 CONSOLE-1 - TALKGROUP 1 and CONVENTIONAL CHANNEL 1 VERSION #1.010	Step 1. Using CONSOLE-1 create a patch between TALKGROUP 1 and CONVENTIONAL CHANNEL 1. Step 2. Initiate a patch call from CONSOLE-1. Step 3. Verify RADIO-1, RADIO-2, RADIO-3, and RADIO-4 can monitor the call Step 4. Initiate several calls between the radios and verify successful communication Step 5. Dissolve the patch created in step 1. Pass___ Fail_____

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Console Initiated Private Call to Subscriber

1. DESCRIPTION	2. TEST
Private Conversation is a selective calling feature which allows a dispatcher or radio user to carry on one-to-one conversation that is heard only by the two parties involved. Subscriber units receiving a private call will sound an alert tone. As with other call types, Private Calls operate across sites as well as within the same site. SETUP RADIO-1 - TALKGROUP 1 RADIO-2 - TALKGROUP 1 CONSOLE-1 - TALKGROUP 1 VERSION #1.020	Step 1. Using CONSOLE-1, select the "PRIVATE- CALL" tile and click the Private Call function. Step 2. Select the unit to be Private Called, in this case RADIO-1. (or select the numeric keypad and enter the Unit ID to be Private Called.) Step 3. Click the Send button. Step 4. Answer the Private Call with RADIO-1 and respond to the console. Step 5. Verify RADIO-2 does not hear the private conversation. Step 6. After completing the Private Call, return to the normal talkgroup mode. Pass_____ Fail_____

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Instant Recall Recorder (IRR) Operation

1. DESCRIPTION	2. TEST
The Instant Recall Recorder (IRR) allows for audio from a radio call to be played back at the CC HUB Console position. Playback recorded audio is accessible via the Activity Log tab. Audio is kept for 24 hours and then it is flushed out. Audio is recorded on all resources affiliated with the dispatch position. SETUP RADIO-1 - TALKGROUP 1 RADIO-2 - TALKGROUP 1 CONSOLE-1 - TALKGROUP 1 Note: In order to see outbound calls and parallel Consoles calls you need to configure Activity log settings via Admin mode. VERSION #1.010	Step 1. Make sure Activity Log tab is available for selected configuration. Step 2. Initiate radio communication between RADIO- 1 and RADIO-2. Step 3. Verify a new entry appears in the Activity Log. Step 4. Select the new entry from the Activity Log list. Step 5. Press play and verify conversation replay. Pass_____ Fail

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15 Default Alert Tones Available for Transmission

1. DESCRIPTION	2. TEST
This test demonstrates momentary transmission of the alert tones. It also demonstrates the availability of 15 default tones for transmission SETUP RADIO-1 – TALKGROUP 1 CONSOLE-1 – TALKGROUP 1 CONSOLE- 2 – TALKGROUP 1 VERSION #1.070	Step 1. Configure CONSOLE-1 for default alert tone transmission. Step 2. Observe that 15 default alert tones are present. Step 3. Observe that the alert tones can be selected from the alert tone pull down. Step 4. Observe that the alert tones can be selected from the alert tone buttons. Step 5. Observe that the tool tip pops up when the mouse is place over an alert tone button. Step 6. Transmit from any alert tone from 1 to 15 for alert tone transmission. Step 7. Observe the alert tone can be heard both by RADIO-1 and CONSOLE-2. Pass_____ Fail_____

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CC Hub Redundant Network Interface Operation

1. DESCRIPTION	2. TEST
This test will demonstrate the CC Hub's ability to maintain its networking capability and transmit/receive audio when individual network interfaces within the (optional) redundant network interface pair are disconnected at the console. SETUP CONSOLE-1 – TALKGROUP 1 (Selected), TALKGROUP 2 (Unselect mode) RADIO-1 – TALKGROUP 1 CONSOLE-1 –TALKGROUP 1 VERSION #1.010	Step 1. Verify CONSOLE-1 active network status using nmcli command via command line. Step 2. Disconnect primary NIC interface at CONSOLE-1 Step 3. Initiate a wide area call from CONSOLE-1 on TALKGROUP 1. Step 4. Observe that RADIO-1 is able to monitor the call. Dekey the console and have RADIO-1 respond to the call. Step 5. Observe that the radio transmission on TALKGROUP 1 can be monitored at CONSOLE-1. Dekey RADIO-1. Step 6. Reconnect primary NIC interface at CONSOLE-1. Disconnect redundant NIC interface at CONSOLE-1. Pass_____ Fail_____

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Activity Log Operation with Resource Preview Functionality - Trunking

1. DESCRIPTION	2. TEST
The Console activity log will show all inbound radio traffic for the resource assigned to that console to include the time, radio alias, TG, PTT ID and Emergency Call. The dispatcher has the capability of open resource preview for entry in activity log in order to perform any action for the resource. The Resource Preview option allows for quick access to resource functionality from Activity Log. It opens a pop-up window with default resource preview from Activity Log entry. All operations are supported from the Resource Preview. Note: In order to see outbound calls and parallel Consoles calls you need to configure Activity log settings via Admin mode. SETUP RADIO-1 - TALKGROUP 1 RADIO-2 - TALKGROUP 1 CONSOLE-1 - TALKGROUP 1 VERSION #1.010	Step 1. Make sure the Activity Log tab is available for selected configuration. Step 2. Initiate radio communication between RADIO- 1 and RADIO-2. Step 3. Verify that a new entry appears in the Activity Log. and proper information about time, radio ID/Alias, TG are displayed. Step 4. Select the new entry from the Activity Log list and press the resource preview button. Step 5. Verify that pop-up window with TALKGROUP 1 resource opened up. Step 6. Initiate a Instant Transmit from CONSOLE-1 on TALKGROUP 1 via resource in the pop-up window. Step 7. Observe that RADIO-1 and RADIO-3 is able to monitor the call. Dekey the console and have RADIO-1 respond to the call. Pass_____ Fail_____

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Active Microphone Selection

1. DESCRIPTION	2. TEST
If a desktop microphone is connected to a dispatch position while one or two headsets are connected, then the desktop microphone is only active during a transmit function if its transmit button is pressed. This prevents the desktop microphone from picking up unwanted background sound while the dispatcher is using a headset to transmit. SETUP RADIO-1 - TALKGROUP 1 CONSOLE-1 - TALKGROUP 1 Note: CONSOLE-1 has Headset 1, headset 2 and desktop microphone connected to CCHub Headset 1 Mic, Headset 2 Mic and desktop Mic are configured in PCT VERSION #1.000	Step 1. Select TALKGROUP 1 resource on AXS Step 2. Press General Transmit on AXS UI Step 3. Speak to Headset 1 microphone and verify that RADIO-1 hears audio from Headset 1 microphone Step 4. Speak to Headset 2 microphone and verify that RADIO-1 hears audio from Headset 2 microphone Step 5. Speak to Desktop microphone and verify that RADIO-1 does not hear audio from Desktop microphone Step 6. Release General Transmit button on AXS UI Step 7. Press PTT on Desktop microphone Step 8. Speak to Headset 1 microphone and verify that RADIO-1 does not hear audio from Headset 1 microphone Step 9. Speak to Headset 2 microphone and verify that RADIO-1 does not hear audio from Headset 2 microphone Step 10. Speak to Desktop microphone and verify that RADIO-1 hears audio from Desktop microphone Pass_____ Fail

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Acoustic Crossmute – Mute Speaker and Headset

1. DESCRIPTION	2. TEST
Acoustic crossmuting means that selected operator positions will not hear outbound transmissions from operator positions with which they are cross-muted. This feature is used when operator positions are located in the same dispatch site. This test case verifies operation when the Acoustic Cross Mute RF Cross Mute Scope parameter is set to “Speaker and Headset” under PCA of AXS Cluster. When configured as such Acoustic Crossmute causes the muting of both the speakers and headset. The consoles under test can be AXS Console. SETUP RADIO-1 - TALKGROUP 1 CONSOLE-1 - TALKGROUP 1 CONSOLE-2 - TALKGROUP 1 CONSOLE-3 - TALKGROUP 1 CONSOLE-4 - TALKGROUP 1 VERSION #1.010	Step 1. Verify Acoustic Crossmute is not configured for CONSOLE-1 and CONSOLE-2. Step 2. Select TALKGROUP 1 resource on CONSOLE-1 and CONSOLE-2 Step 3. Without Acoustic Crossmute configured, with the select speakers of CONSOLE-1 and CONSOLE-2 turned to maximum volume, initiate a call on TALKGROUP 1 using CONSOLE-1. Step 4. Confirm feedback is heard on the operator positions and RADIO-1 hears feedback on TALKGROUP 1. Step 5. Turn the volume to minimum on CONSOLE-1 and CONSOLE-2. Step 6. Verify Acoustic Crossmute is configured for CONSOLE-3 and CONSOLE-4 and that the Acoustic Cross Mute RF Cross Mute Scope parameter is set to “Speakers and Headset” for CONSOLE-4 in a PCA for AXS Cluster. Step 7. Select TALKGROUP 1 resource on CONSOLE-3 and CONSOLE-4. Step 8. With Acoustic Crossmute configured, with the select speakers of CONSOLE-3 and CONSOLE-4 turned to maximum volume, initiate a call on TALKGROUP 1 using CONSOLE-3. Step 9. Verify no feedback is heard at CONSOLE-3 and CONSOLE-4 and that RADIO-1 hears any feedback on TALKGROUP 1. Step 10. Plug a headset into CONSOLE-4 and verify that TALKGROUP 1 audio is not heard in the headset. Pass_____ Fail_____

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Acoustic Crossmute - Mute Speaker Only

1. DESCRIPTION	2. TEST
Acoustic crossmuting means that selected operator positions will not hear outbound transmissions from operator positions with which they are cross-muted. This feature is used when operator positions are located in the same dispatch site. This test case will demonstrate operation when the Acoustic Cross Mute RF Cross Mute Scope parameter is set to the default value of “Speaker”. When configured as such Acoustic Crossmute causes the muting of the speakers only. The consoles under test can be AXS Console. SETUP RADIO-1 - TALKGROUP 1 CONSOLE-1 - TALKGROUP 1 CONSOLE- 2 - TALKGROUP 1 CONSOLE-3 - TALKGROUP 1 CONSOLE- 4 - TALKGROUP 1 The Consoles are located within the same dispatch site. VERSION #1.010	Step 1. Verify Acoustic Crossmute is not configured for CONSOLE-1 and CONSOLE-2. Step 2. Select TALKGROUP 1 resource on CONSOLE-1 and CONSOLE-2 Step 3. Without Acoustic Crossmute configured, with the select speakers of CONSOLE-1 and CONSOLE-2 turned to maximum volume, initiate a call on TALKGROUP 1 using CONSOLE-1. Step 4. Confirm feedback is heard on the operator positions and RADIO-1 hears feedback on TALKGROUP 1. Step 5. Turn the volume to minimum on CONSOLE-1 and CONSOLE-2. Step 6. Verify Acoustic Crossmute is configured for CONSOLE-3 and CONSOLE-4 and that the Acoustic Cross Mute RF Cross Mute Scope parameter is set to the default value of “Speakers” for CONSOLE-4 in a PCA for AXS Cluster. Step 7. Select TALKGROUP 1 resource on CONSOLE-3 and CONSOLE-4. Step 8. With Acoustic Crossmute configured, with the select speakers of CONSOLE-3 and CONSOLE-4 turned to maximum volume, initiate a call on TALKGROUP 1 using CONSOLE-3. Step 9. Verify no feedback is heard at CONSOLE-3 and CONSOLE-4 and that RADIO-1 hears any feedback on TALKGROUP 1. Step 10. Plug a headset into CONSOLE-4 and verify that TALKGROUP 1 audio is heard in the headset. Pass_____ Fail_____

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Radio Control Manager (RCM) Features
Radio Check (Single Site)

1. DESCRIPTION	2. TEST
Radio Check is a RCM command used to verify that a radio is active in the trunking system. The Radio Check command causes the Zone Controller to poll for the radio requesting that the radio re-affiliate. When the radio re-affiliates, the RCM then has the knowledge that the radio is powered on and within system range. If the radio is involved in a conversation, whether group or interconnect, the RCM application displays a message to that effect. The information displayed by the RCM in response to the Radio Check command is: current talkgroup affiliation, the multigroup that the talkgroup is attached to (assuming the talkgroup belongs to a multigroup), and the site where the radio is affiliated. If the radio does not respond to the Radio Check command, a message to that effect displays. SETUP RADIO-1 - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO-2 - SITE - SITE 1 VERSION #1.030	Step 1. Select the Status menu and then select the Radio Check item to open the Radio Check window. Step 2. Enter the ID or alias of RADIO-2 into the entry box and click the Apply button. Step 3. Observe the radio is polled and the current radio information is displayed on the RCM. Step 4. Turn off RADIO-1. Step 5. Enter the ID or alias of the RADIO-1 into the entry box and click the Apply button. Step 6. Observe that the RCM displays "Radio Not Found." Step 7. Depress and hold the PTT button of RADIO-2 until instructed to release. Step 8. Enter the ID or alias of RADIO-2 into the entry box and click the Apply button. Observe that a busy for the radio is displayed on the RCM. Step 9. Release the PTT button on RADIO-2. Step 10. Observe the radio is polled and the current radio information is displayed on the RCM. Pass_____ Fail_____

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Radio Status

1. DESCRIPTION	2. TEST
This optional feature allows the Radio Control Manager (RCM) to view status information sent in by subscribers. Statuses are used to indicate the Radio operator's operational state (e.g. off duty). The information that will be displayed includes the radio alias, talkgroup alias, hour and minute time stamp, status number or message number, and the customer entered translation for the specific status. Status input is displayed in chronological order, independent of the type of status number. SETUP RADIO-1 - TALKGROUP 1 RADIO- 1 - SITE - SITE 1 * Configure RADIO-1 in the manager to use a particular status set. * Configure the assigned status set (via the status set manager configuration objects) to include text translations for a few different statuses. * The RCM user needs to be assigned the dispatch attachment group that matches the radio user's assigned dispatch attachment group. VERSION #1.020	Step 1. Initiate a Status transmission from RADIO-1. Step 2. Verify the RCM displays the proper Status text. Pass_____ Fail_____

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Selective Radio Inhibit

1. DESCRIPTION	2. TEST
The INHIBIT command issued by the Radio Control Manager (RCM) disables a radio, preventing it from transmitting or receiving any audio. All of the radio's functionality ceases while a radio is inhibited by the RCM. Once inhibited, the radio cannot be used to monitor voice channels or for any other radio user initiated activity. Note that an inhibited radio still monitors the control channel so that it can be re- enabled with the Cancel Inhibit command. Upon receiving the Cancel Inhibit command from the RCM, the radio returns to its normal operation. SETUP RADIO-1 - TALKGROUP 1 RADIO- 1 - SITE - SITE 1 VERSION #1.030	Step 1. With the RCM open from the main Command tab click on the “+” button. Step 2. Enter the IDs or aliases of RADIO-1. Step 3. Select "Selective Inhibit" button. Step 4. Once all desired radio information is entered and appears in the command window click the submit to initiate the command. Step 5. Observe RADIO-1 is inhibited and appears to be dead. Step 6. Observe that the Inhibit task appears in the Command tab. Step 7. Cancel the Inhibit by selecting the task in the Command tab and clicking the Revert button to submit the task. Step 8. Observe that the Cancel Inhibit task appears in the Command tab and that RADIO-1 is returned to normal operation. Pass_____ Fail

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Dynamic Regrouping (Single Site)

1. DESCRIPTION	2. TEST
Dynamic Regrouping allows the RCM to assign individual radios operating in different talkgroups to a temporary talkgroup via the Regroup command. Network managers or supervisors can override individual radio talkgroup selections by steering regrouped subscribers to a new talkgroup containing users which need to communicate on a temporary basis. After receiving a Regroup command, a radio will ignore the current setting of the talkgroup selector and move to the target talkgroup specified in the Regroup command. Unless the supervisor issues a LOCK command, the radio user can deselect the target talkgroup by selecting another talkgroup using the radio selector. A unique location on the radio selector is reserved for the target talkgroup following a Regroup command. Dynamic Regrouping assignments can be initiated rapidly, but not instantaneously. Regrouping is best suited for planned activities or occasional changes from normal routines. It is not intended for immediate responses such as high speed chases or for a rapid deployment on a per incident basis. Regrouped radios receiving a second Regroup command will move to the new target talkgroup specified in the second command. When a regrouped radio receives a Regroup command, all information pertaining to the previous Regroup command is lost. A Cancel Regroup command or a Revert returns an individual radio to its normal operation. Note - RCM user must be attached to primary and target talkgroup. SETUP RADIO-1 - TALKGROUP 1 RADIO- 1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO- 2 - SITE - SITE 1 RADIO-3 -	Step 1. With the RCM open from the main Command tab click on the “+” button . Choose Regroup. Step 2. Enter TALKGROUP 3 in the target field. Step 3. Enter the IDs or aliases of RADIO-1, RADIO- 2, RADIO-3 and RADIO-4. Step 4. Once all desired radio information is entered and appears in the command window click the submit to initiate the command. Step 5. Observe all radios are regrouped and are able to communicate on TALKGROUP 3. Step 6. Switch the Subscriber to the Dynamic Regroup channel to acknowledge the group request. Step 7. Observe that the radios are able to select different talkgroups and are not locked onto the regrouped mode. Note- The Talkgroup selector knob has to be set to the dynamic regroup position before switching to any other talkgroup. Step 8. Observe that the Regroup task appears in the Command tab. Step 9. Issue a Selector Lock command all four radios and verify their selectors have been locked. Step 10. Revert both commands and verify the radios have returned to normal operation. Pass_____ Fail_____

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TALKGROUP 2 RADIO-3 - SITE - SITE 1 RADIO-4 - TALKGROUP 2 RADIO-4 - SITE - SITE 1 VERSION #1.030	

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Storm Plans (Single Site)

1. DESCRIPTION	2. TEST
Storm Plans represent any number of preprogrammed Dynamic Regrouping combinations constructed in advance to anticipate a unique need, such as a disaster, or to make a needed adjustment for an infrequent yet repeated event, like a parade or election. When implemented, a Storm Plan will automatically assign individual radios operating in different talkgroups to a temporary talkgroup, containing the radios specified by the stored Dynamic Regrouping command. Storm Plans are deactivated by selecting the revert option in the Command window. Note - Radios are not required to be locked to a specific site for this test. SETUP RADIO-1 - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO-2 - SITE - SITE 1 RADIO-3 - TALKGROUP 2 RADIO-3 - SITE - SITE 1 RADIO-4 - TALKGROUP 2 RADIO-4 - SITE - SITE 1 Create a storm plan in the Provisioning Manager (PM) that regroups RADIO-1 and RADIO-2 to TALKGROUP 2. VERSION #1.030	Step 1. With the Radio Control Manager (RCM) open from the main tab select the Storm Plan item to open the Storm Plan Window. Step 2. Select the Storm Plan. Step 3. Click on OK or Apply to invoke the Storm Plan. Step 4. Observe that the Storm Plan appears in the Command tab. Step 5. Observe RADIO-1 and RADIO-2 are regrouped. Step 6. Initiate a call from RADIO-1. Step 7. Observe that RADIO-2. RADIO-3 and RADIO- 4 are able to listen to the call. Step 8. Observe that RADIO-1, RADIO-2, RADIO-3 and RADIO-4 are able to initiate and receive calls on TALKGROUP 2. Step 9. Un-regroup the radios by selecting the task in the Command tab and clicking on the Revert button to submit the task. Step 10. Observe that the regrouping of the radios is now dissolved. Pass_____ Fail

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Fault Management
Unified Event Manager - Base Views

1. DESCRIPTION	2. TEST
The Unified Event Manager (UEM) in its base configuration provides a number of views. The purpose of this test is to demonstrate the key views available from the UEM. The Physical Summary and Detail View (Physical Map) and Service Summary and Detail View (Service Map) in previous releases are deprecated and are replaced by the Zone Map. Custom views can be saved and retrieved by other NM Client users. SETUP NMclient01 - UEM session up and running. VERSION #1.010	Step 1. Alarms View: In the navigation pane expand Fault Management and select Alarms. The view displays active alarms for managed resources, displaying impacted managed resources and specific objects on the managed resource along with selected alarm properties. Step 2. Alarm View Search: Customize the Active Alarms display by selecting the View option from the menu bar, then select Search. Perform a Managed Resource search for channels, site controllers and routers by entering "Contains" and ch, sc, and z00 respectively in the search fields to perform the three separate searches. For each of the three searches a filtered alarm view is displayed that contains alarms for the appropriate device in the search. Step 3. Network Events View: In the navigation pane expand Fault Management and select Network Events. The view displays recent events reported for managed resources, displaying impacted managed resources and specific object on the managed resource along with selected event properties. Alarming events are base for creating alarm objects. Step 4. Physical Summary View: In the navigation pane expand Zone Views and Physical, then select Physical Summary View. The Physical Summary View provides an aggregated alarm severity status of the devices located at all subnets in the Zone. Step 5. Service Summary View: In the navigation pane expand Zone Views and Service, then select Service Summary View. The Service Summary View provides a quick summary of the service status of sites in a Zone, including access to Channel status. Step 6. Zone Map: In the navigation pane, expand Zone Views and select Zone Map. The Zone Map view provides an aggregated alarm severity status of the devices located at discovered sites in the Zone. Step 7. Network Database: In the navigation pane select Network Database. The Network Database displays a list of all discovered Managed Resources and Sites. The display includes properties of each resource as well as overall severity of all objects and/or sub resources

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	Pass_____ Fail_____

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Station Power Amp Failure Reports to the Unified Event Manager (UEM)

1. DESCRIPTION	2. TEST
This test will demonstrate that the Unified Event Manager (UEM) alarms view is able to capture information about various failures at the system and zone level. A station will be keyed while the output is unloaded to simulate a power amp failure. The failures will be monitored on the UEM. Note: For safety, either power down the station or TX Inhibit it before disconnecting or re-connecting the dummy load to prevent accidental keying of the station. Note: This test should be done on a site with more than 2 channels. Failsoft will occur if the test is done on a 2 channel site. SETUP RADIO-1 - TALKGROUP 1 RADIO- 1 - SITE - SITE 1 RADIO-2 - TALKGROUP 2 RADIO- 2 - SITE - SITE 1 NMclient01 - UEM session up and running. * All Radios should be "Site Locked" VERSION #1.030	Step 1. Verify that the power amp of the station to be tested has no active alarms against it. Step 2. Disconnect the dummy load/antenna from the station. Step 3. Make several talkgroup calls using RADIO-1 until the test station has been keyed. Step 4. Observe that an alarm indicating a Power Amp failure appears on the UEM alarms view. Step 5. Reconnect the dummy load/antenna disconnected in Step 3. Step 6. In approximately 5 minutes, observe the changes to the alarm on the UEM, indicating the module is restored to service. Pass_____ Fail

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Site Path Failure (Ethernet) Reports to the Unified Event Manager

1. DESCRIPTION	2. TEST
This test will demonstrate that the Unified Event Manager (UEM) alarms view is able to capture information about various failures at the system and zone level. This test simulates a microwave/transport failure by removing a customer selected site data link and monitoring the alerts. Note: If using a Simulcast site, this test refers to the Prime Site links. While failures would be seen at the subsite level if a Subsite link were failed, the site would not drop into Site Trunking. SETUP RADIO-1 - TALKGROUP 1 RADIO- 1 - SITE - SITE 1 NMclient01 - UEM session up and running. * RADIO-1 should be "Site Locked" VERSION #1.030	Step 1. Remove the Ethernet cable(s) to the SITE 1 router(s) (If Simulcast, this refers to the Prime Site router(s)) at the site where RADIO-1 is affiliated. Be certain to remove the Ethernet cable from both routers if redundant site links are being utilized. Step 2. Observe the UEM reports CommFailure alarms for the devices at the affected site. Step 3. In addition, observe that the site is now in the Site Trunking mode. Step 4. Reconnect the Ethernet cable(s) disconnected in Step 1. Step 5. Observe the site returns to the Wide Area Trunking mode. Step 6. Observe the topology and alarms/events that appear in the UEM, indicating the site is in recovery and after a period of time has recovered. Pass_____ Fail_____

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Ethernet Site Link Round Trip Delay Fault Reports to the Unified Event Manager – Juniper

1. DESCRIPTION	2. TEST
When the average round trip IPTD(delay) statistic exceeds the IPTD Fault Threshold for an Ethernet Site/Interzone Link, an event is sent to the Unified Event Manager (UEM). NOTE: This test is only valid if it is executed on a real Ethernet Site/Interzone Link that has 10ms or more of round trip delay. 10ms is the minimum configurable value. SETUP No prior setup is necessary. Note: This test will not be practical to run in staging because the link delays would not exceed the threshold in most cases even at the minimum settings. This test, if used, should be reserved for execution in the field under real conditions. VERSION #1.010	Step 1. On both routers at each end of the Ethernet Site/Interzone Link(ie Core & Site Router for a site link), configure the IPTD(delay) threshold for the minimum value of 10ms. (Follow step 2 procedure) Step 2. In the UNC, right-click on each router and select SetTWAMP Round Trip Delay Threshold and Enable Trap from the Saved Commands. After selecting the Saved Commands option, navigate using the Up button and double clicking on folders within the folder list to get to: LibraryManager>System > Motorola > Juniper router>TWAMP. This folder contains additional folders specific for the link type so choose the proper one. Step 3. After the end of next full measurement interval(approximately 30 minutes) check for the event reporting. In UEM, select Fault Management > Events. Step 4. Verify Unified Event Manager displays an event for the configured routers indicating that the IPTD Fault Threshold has been exceeded, including the IPTD(delay) value. Step 5. Using the procedure in Step #1, set the trap threshold to the appropriate value for the Ethernet Site/Interzone link. This value is determined during system planning and provisioning of the customer backhaul network. The default value is 40ms. Pass_____ Fail_____

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Unified Event Manager - Digital Notifications for Events (Email)

1. DESCRIPTION	2. TEST
The Unified Event Manager (UEM) is an element management system which manages network elements of the ASTRO® 25 Network. One of the main functions of the UEM is to receive events from network elements, process them, correlate events to alarms, and present them to the operator. The UEM supports the Digital Notification functionality which allows sending an e-mail notification upon receiving an event or alarm matching user-defined criteria. The e-mails are sent to an external mail server using Simple Mail Transfer Protocol (SMTP). This test demonstrates the configuration for digital notifications and that they get routed to the proper destination. SETUP UEM with the digital notification option VERSION #1.040	Step 1. On a UEM client session, configure a digital notification rule for a logical element and a physical device. On the UEM select, Fault Management and then Alarms. Select Edit from toolbar at top of window. Next select configure and then Alarm Filter. Enter your configuration parameters and alarm filtering information. Step 2. Perform action(s) on the system (including the logical element, physical device, and other managed objects) that would cause events to be generated. Step 3. Verify the alarms are displayed in the UEM. Step 4. Verify only the events from the specified logical element and physical device are forwarded to the external system (such as the configured Email Server). Step 5. Verify events from other managed objects which do not have any digital notification rules are not forwarded. Step 6. Return the system to normal operation. (Clear the alarm conditions) Verify that the alarms clear in the UEM. Pass_____ Fail_____

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Motorola Solutions

Alarm Processing – Acknowledged/Un-acknowledge Alarm

1. DESCRIPTION	2. TEST
The Unified Event Manager (UEM) provides the user the ability to acknowledge alarms raised against managed resources and their objects. The operation is available for users with appropriate permissions and audited. This is the base UEM alarm acknowledgement functionality available in all UEM deployments. It is further enhanced if Enhanced Navigation is enabled. SETUP No prior setup is required. VERSION #1.040	Step 1. Login to UEM Client as user with permissions to perform alarm acknowledge operation. Step 2. Create an alarm condition by simulating an alarm on a managed device in the system. Step 3. Navigate to Alarms View and sort by clicking on the header of Ack Status column. Step 4. Review all not acknowledged alarms and locate test alarm that has been generated. Step 5. Double-Click on the alarm to open Alarm details window. Step 6. Ack status value should be set to Not acknowledged. Step 7. Click Acknowledge button to acknowledge this alarm and verify that Acknowledge status has changed to include information on the current user and timestamp of the operation. The Alarms view should show alarm status as Acknowledged. Step 8. Click Unacknowledged button and verify that Acknowledge status has changed to Unacknowledged and includes information on the current user and timestamp of the operation. Step 9. Restore the system to normal operation and verify the alarm clears. Pass_____ Fail_____

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Alternative for SRX Edge Router Failure Reports to the Unified Event Manager

1. DESCRIPTION	2. TEST
This test will demonstrate that the Unified Event Manager (UEM) alarms view is able to capture information about various failures at the system and zone level. An Edge Router will be powered down to simulate a failure. The system health will be monitored on UEM. NOTE: Powering down Edge Router 1 or 2 down will affect both the Site Connections and the InterZone Routing functions. Powering down Edge routers 3 – 8 only impact site connections SETUP NMclient01 - UEM session up and running. VERSION #1.020	Step 1. Verify that the Edge Router to be tested displays without failures (normal) on UEM. The Edge Router is contained in the specific subnet that it is physically collocated with in the network. Step 2. Power down the Edge Router from the Command Line Interface. Step 3. Observe that an alarm indicating a Edge Router failure appears on the UEM alarms view. Step 4. Power up the Edge Router from the Power Button Step 5. Observe the changes to the alarm in UEM, indicating the Edge Router is enabling. Step 6. Observe that alarm view updates in the UEM, indicating the Edge Router has recovered and is enabled. Pass_____ Fail_____

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Motorola Solutions

Alternate Redundant Site Router Failure at a BR Site with Juniper SRX Routers

1. DESCRIPTION	2. TEST
BR site with redundant Routers continues to function after losing one of the Routers. SETUP Zone Core Conventional Subsystem with a BR Site Radio-1 Radio-2 Conventional Channel-1 All radios and Conventional Channels are members of the same conventional subsystem and are not external to the conventional subsystem. Conventional channels can be digital or CCGW based Analog, MDC1200, or Mixed Mode. The test cases may be executed using any of the following methods: 1) Radio-1 to Radio-2 through channels patched at the Console 2) Radio 1 through voting channels routed thru the conventional subsystem in repeat mode to Radio-2 3) Radio-1 to console or console to Radio-2 VERSION #1.020	Step 1. Initiate a Conventional call from Radio-1 on Conventional Channel-1. Step 2. Verify that Radio-2 receives the audio. Step 3. Power down the BR Router from the Command Line Interface. Step 4. Observe, in the Unified Event Manager that, one Site Router has failed. Step 5. Initiate a Conventional call from Radio-1 on Channel Resouce-1. Step 6. Verify that Radio-2 receives the audio. Step 7. Power up the BR Router. Pass_____ Fail_____

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System Reliability Features
Multiple Control Channels

1. DESCRIPTION	2. TEST
A maximum of four channels are eligible for assignment as control channel at each site. In the event that the assigned control channel fails at any remote site, the Zone Controller automatically selects one of the other control capable channels as the active control channel for that site. A Control Channel Preference Level can be used to rank the control capable channels where 1 is the highest ranking and 4 the lowest. SETUP RADIO-1 - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO-2 - SITE - SITE 1 RADIO-3 - TALKGROUP 2 RADIO-3 - SITE - SITE 1 RADIO-4 - TALKGROUP 2 RADIO-4 - SITE - SITE 1 VERSION #1.020	Step 1. Initiate a Talkgroup Call with RADIO-1 on TALKGROUP 1. Step 2. Observe that only RADIO-2 will be able to monitor and respond to the call. Step 3. Initiate a Talkgroup Call with RADIO-3 on TALKGROUP 2. Step 4. Observe that only RADIO-4 will be able to monitor and respond to the call. Step 5. Power off the control channel at SITE 1. Step 6. Observe that the control channel rotates to the next available channel capable of acting as a control channel. Step 7. Initiate a Talkgroup Call with RADIO-1 on TALKGROUP 1. Step 8. Observe that only RADIO-2 will be able to monitor and respond to the call. Step 9. Initiate a Talkgroup Call with RADIO-3 on TALKGROUP 2. Step 10. Observe that only RADIO-4 will be able to monitor and respond to the call. Power up the channel previously powered off to return the system to normal operation. Pass_____ Fail_____

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Transmitter Power Failure Shutdown

1. DESCRIPTION	2. TEST
The repeaters can detect a loss or decrease in transmitter output power of all trunked repeaters connected to it. Each trunked repeater contains an internal wattmeter element. Once the forward power has decreased past the threshold set, the repeater instructs the Zone Controller to take the channel out of service. If reflected power increases past the threshold set, the repeater will also instruct the Zone Controller to take the channel out of service. Once the station threshold has been exceeded and the station taken out of service a 5 minute timer will start. At the timer expiration a transmitter test will start to perform a self check on the station. This self check lasts for 20 seconds. If the station passes the self check it will be placed back into service. Note: This test should be done on a site with more than 2 channels. Failsoft will occur if the test is done on a 2 channel site. SETUP RADIO-1 - TALKGROUP 1 VERSION #1.010	Step 1. Select a channel to disconnect the transmit antenna connection to the trunked repeater. (This will cause a high VSWR condition) Step 2. Key RADIO-1 so that the selected channel is assigned, and verify that the channel disables due to an alarm condition. Verify that this alarm is reported at the Unified Event Manager (UEM). Step 3. Wait 30 seconds after the failure then restore the transmit antenna connection to the trunked repeater. Step 4. Using the station LEDs, verify that the time it takes from the corrected connection to the station being placed back in service is within 5 minutes. Step 5. Verify the Unified Event Manager (UEM) also reports the station being back in service. Pass_____ Fail_____

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Redundant Zone Controller Switching/Automatic Switchover

1. DESCRIPTION	2. TEST
In a non-DSR configuration the Zone Controller subsystem uses two Zone Controllers in a redundant configuration. The backup Zone Controller is made active either upon the loss of the active ZC or upon a user command from the Unified Network Configurator (UNC). In a DSR configuration there are 4 Zone Controllers in a redundant configuration. Any one of the 4 could be active to keep the Zone Sites in Wide Area Trunking. If using the Dynamic Resilience Zone configuration the Unified Event Manager will report the Zone Controller switchover in both Unified Event Managers (UEM). SETUP RADIO-1 - TALKGROUP 1 RADIO- 1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO- 2 - SITE - SITE 2 RADIO-3 - TALKGROUP 1 RADIO-3 - SITE - Site3 (Site3 should be in another Zone if applicable.) * The Zone Controllers should be successfully synchronized before performing this procedure. VERSION #1.030	Step 1. Verify the state of the current Zone Controllers is Active or Standby in the Unified Network Configurator (UNC). (There will be 2 Zone Controllers in single Zone or 4 in the case of DSR zones.) Step 2. Reset the active Zone Controller application via the Unified Event Manager (UEM) diagnostic. Step 3. Verify using UNC, UEM and ZoneWatch (if applicable) that the standby Zone Controller becomes active and brings all sites back wide. Wait for the Radios to settle out the site affiliations. Step 4. Key RADIO-1 and verify that RADIO-2 and RADIO-3 hear the audio. Step 5. End the call from RADIO-1. Step 6. Verify that Zone Controller that was reset comes back up to a “Standby” state. Pass_____ Fail_____

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Primary Prime Site Link Failure – Simulcast GEO Prime Site to Zone Core Ethernet Link

1. DESCRIPTION	2. TEST
This test shows that in the event of a failure of the link between the primary prime site and the zone core, the voice traffic from the primary prime site is rerouted through the secondary prime site to the zone core. SETUP RADIO-1 - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO-2 - SITE - SITE 2 VERSION #1.040	Step 1. Initiate a talkgroup call from RADIO-1 on TALKGROUP 1. Keep the radio keyed up until instructed to dekey. Observe that RADIO-2 receives the audio. Step 2. Create a site link failure (prime site to zone core) by disconnecting the Ethernet LAN cable from the Prime Site Router at the primary prime SITE 1. Step 3. Worst case, observe an audio hole in from RADIO-1 to RADIO-2, but that the call continues. Dekey RADIO-1. Step 4. Observe, in the Unified Event Manager, that the site link has failed. Step 5. Observe that the SITE 1 continues to operate in Wide Area Trunking. Step 6. Initiate a talkgroup call from RADIO-1 on TALKGROUP 1. Keep the radio keyed up until instructed to dekey. Observe that RADIO-2 receives the audio. Step 7. Reconnect the Ethernet LAN cable to the Prime Site Router at the primary prime SITE 1. Step 8. Observe that SITE 1 continues to operate in Wide Area Trunking. Step 9. Observe that RADIO-2 receives the audio from RADIO-1. Step 10. Dekey RADIO-1. Pass_ Fail__

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Single Comparator Failure at Primary GEO-Prime Site

1. DESCRIPTION	2. TEST
This test shows that in the event of a failure of any comparator at the primary prime site, channel capacity will be restored via the redundant comparator at the secondary prime site. Simulcast remote site audio for that channel is rerouted to the corresponding comparator at the secondary prime site and that comparator assumes voting functionality for that channel. SETUP NOTE: If there are a large number of channels, you may want to reduce the number of available channels. RADIO-1 TALKGROUP 1 - SITE 1 RADIO-2 TALKGROUP 1 - SITE 1 VERSION #1.040	Step 1. Initiate a talkgroup call from RADIO-1 on TALKGROUP 1 on the channel to be demonstrated. Keep the radio keyed until instructed to release. Observe that RADIO-2 receives the audio. Step 2. Create a comparator failure at the primary prime site by disconnecting the Ethernet LAN cable between the comparator and the corresponding Prime Site LAN Switch. Step 3. Observe the call is dropped. Step 4. Observe, in the Unified Event Manager, that the comparator has failed. Step 5. Observe that the channel returns to service after a brief outage. Step 6. Using RADIO-1, initiate talkgroup calls until the test channel is assigned. Observe that RADIO-2 receives the audio. Step 7. Dekey RADIO-1. Step 8. Reconnect the Ethernet LAN cable between the comparator and the Prime Site LAN switch at the primary prime site. Observe that the comparator is brought back online and that any alarms are cleared in the UEM. Step 9. Observe that the channel remains in service Step 10. Using RADIO-1, initiate talkgroup calls until the test channel is assigned. Observe that RADIO-2 receives the audio. Dekey RADIO-1. Pass_____ Fail_____

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System Management Tests
ZoneWatch (Single Site)

1. DESCRIPTION	2. TEST
ZoneWatch is an administration tool for monitoring radio traffic on a system. A system manager can use ZoneWatch to analyze traffic patterns for load distribution and troubleshoot radio and site problems. ZoneWatch is used to view current radio traffic activity for the system. This activity is displayed in graphical format, color-coded for easy identification of the type of activity occurring on the system. SETUP RADIO-1 - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO-2 - SITE - SITE 1 RADIO-3 - TALKGROUP 1 RADIO-3 - SITE - SITE 1 RADIO-4 - TALKGROUP 1 RADIO-4 - SITE - SITE 1 VERSION #1.010	Step 1. Verify that ZoneWatch has been configured for the Grid and Multi Site Scroll windows to display system activity. Step 2. From the PC Application Launcher, select a zone folder. Step 3. From within that zone, select ZoneWatch. Step 4. Select the appropriate profile to be able to view the channel usage on the system. Step 5. Initiate several calls with the radios and observe that the appropriate channel usage information is displayed. Pass_____ Fail_____

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Affiliation Display (Single Site)

1. DESCRIPTION	2. TEST
Affiliation Display is a Private Radio Network Management (PRNM)application that monitors the mobility of radios for a particular zone. Mobility describes how radio users travel between different sites in a zone and how they communicate with other members of their assigned talkgroup or even with members outside of their talkgroup. A radio can be viewed in more than one zone. As a radio roams from one site to another or changes talkgroups, Affiliation Display updates and displays the affiliation and de- affiliation information for a monitored radio. This information can be useful for the troubleshooting and tracking of radios in the system and for monitoring the movement of traffic within a zone. The Affiliation Display is divided into three sections: Site Viewer, Talkgroup Viewer, and Radio Viewer. - The Site Viewer displays the number of talkgroups and number of radios affiliated to that site. - The Talkgroup Viewer displays how many radios are affiliated to that talkgroup and the number of sites at which the talkgroup has radios affiliated. - The Radio Viewer window displays affiliation information for a custom list of radios. SETUP RADIO-1 - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO-2 - SITE - SITE 1 RADIO-3 - TALKGROUP 2 RADIO-3 - SITE - SITE 1 RADIO-4 - TALKGROUP 2 RADIO-4 - SITE - SITE 1 VERSION #1.010	Step 1. Add RADIO-1,RADIO-2,RADIO-3, and RADIO-4 to the Affiliation Display. Step 2. Verify that RADIO-1 and RADIO-2 show they are affiliated to SITE 1 and TALKGROUP 1. Step 3. Verify that RADIO-3 and RADIO-4 show they are affiliated to SITE 1 and TALKGROUP 2. Step 4. Change the talkgroup of RADIO-1 and RADIO-2 to TALKGROUP 2. Step 5. Verify that RADIO-1 and RADIO-2's affiliated talkgroup changes to TALKGROUP 2 on the Affiliation Display. Pass_____ Fail_____

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Configuration Management - Subscriber Capabilities

1. DESCRIPTION	2. TEST
The Provisioning Manager (PM) controls the parameters for all radio users and dispatchers on the system. Within the Subscriber section, the Radio User Configuration Window enables the network manager to tailor SmartZone subscribers' capabilities. Multigroup, Secure, Call Alert, Private Call, and Telephone Interconnect are some of the features that can be enabled or disabled. The features that could be unique to the particular user are configured directly in the Radio User Configuration Window. The features that could be configured the same for a group of users are placed into records called profiles. The network manager references the profile which contains the desired setup for these features from the Radio User Configuration Window. Note - A profile must already exist to be referenced through the Radio Configuration Window but can be modified later if needed. SETUP RADIO-1 - TALKGROUP 1 RADIO- 1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO- 2 - SITE - SITE 2 * Flag both radios to be capable of Call Alert, Private Call, and Dispatch Calls. * Set the "User Enabled" flag to YES for both RADIO- 1 and RADIO-2. VERSION #1.010	Step 1. Initiate a Call Alert (PAGE) from RADIO-1 to RADIO-2. Verify that RADIO-2 receives the Call Alert. Step 2. Change the Call Alert Enabled flag to NO for RADIO-1 via the PM. Step 3. Initiate a Call Alert from RADIO-2 to RADIO-1. Verify that RADIO-2 receives a reject when attempting to Call Alert RADIO-1. Step 4. Change the Call Alert Enabled flag back to YES for RADIO-1 via the PM. Step 5. Initiate a Call Alert from RADIO-2 to RADIO-1. Verify that RADIO-1 now receives the Call Alert. Step 6. Initiate a Private Call (CALL) from RADIO-1 to RADIO-2. Verify that RADIO-2 receives the Private Call. Step 7. Change the Private Call Enabled flag to NO for RADIO-1 via the PM. Step 8. Initiate a Private Call from RADIO-2 to RADIO-1. Verify that RADIO-2 receives a reject when attempting to Private Call RADIO-1. Step 9. Change the Private Call Enabled flag back to YES for RADIO-1 via the PM. Step 10. Initiate a Private Call from RADIO-2 to RADIO-1. Verify that RADIO-1 now receives the Private Call. Pass_____ Fail_____

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Configuration Management - Talkgroup Capabilities

1. DESCRIPTION	2. TEST
The Provision Manager (PM) controls the parameters for all radio users and dispatchers on the system. Within the Subscriber section, the Talkgroup Configuration Window enables the network manager to tailor SmartZone Talkgroup Capabilities. Emergency, Secure and Priority Monitor are some of the features that can be enabled or disabled. The features that could be unique to the particular user are configured directly in the Talkgroup Configuration Window. The features that could be configured the same for a group of users are placed into records called profiles. The network manager references the profile which contains the desired setup for these features from the Talkgroup Configuration Window. NOTE: A profile must already exist to be referenced through the Talkgroup Configuration Window but can be modified later if needed. SETUP RADIO-1 - TALKGROUP 1 RADIO- 1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO- 2 - SITE - SITE 2 * Set the "Talkgroup Enabled" flag to YES for TALKGROUP 1 in the PM. VERSION #1.030	Step 1. Initiate a call from RADIO-1 on TALKGROUP 1. Verify that RADIO-2 hears the RADIO-1 audio. Step 2. Change the Talkgroup Enabled flag to NO for TALKGROUP 1 via the PM. Step 3. Initiate a call from RADIO-1 or RADIO-2 on TALKGROUP 1. Verify that neither radio can initiate a call because of the change in status of the Group Enabled Flag of TALKGROUP 1. Step 4. Initiate an Emergency call from RADIO-1. Verify that both the console (if present) and RADIO-2 can hear the transmission. Step 5. Dekey RADIO-1. Step 6. Change the Talkgroup Enabled flag back to YES for TALKGROUP 1 via the PM. Step 7. Initiate a call from RADIO-1 on TALKGROUP 1. Verify that both the console (if present) and RADIO- 2 hear RADIO-1. Pass_____ Fail_____

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Unified Event Manager - Diagnostics - Multisite Site

1. DESCRIPTION	2. TEST
The purpose of this test is to demonstrate diagnostic commands can be sent to a Radio Frequency (RF) site and the proper status is reported at the Unified Event Manager (UEM). All commands are initiated from the UEM. For this test the MultiSite configurations will be demonstrated. SETUP NMclient01 - UEM session up and running in the Network Database view. VERSION #1.000	Step 1. From the UEM, right click on a MultiSite Site managed resource and select the Command option. Step 2. The command window opens for the Multisite Site managed resource with the following commands available: Site Trunking, Site Off, Wide Trunking, and Site Failsoft. Step 3. Select Site Trunking and click the Apply button. Step 4. The command execution status is displayed in the command window. After the command is executed, the site enters site trunking mode. The event is displayed in the Network Events Browser. An alarm is displayed in the Alarms Browser. Step 5. Select Site Off and click the Apply button. Step 6. The command execution status is displayed in the command window. After the command is executed, the site enters site off mode. The event is displayed in the Network Events Browser. An alarm is displayed in the Alarms Browser. Step 7. Select Wide Trunking and click the Apply button. Step 8. The command execution status is displayed in the command window. After the command is executed, the site enters wide trunking mode. The event is displayed in the Network Events Browser. Pass_____ Fail_____

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Dynamic System Resilience
Automatic Registration Server (Presence Notifier) Registration

1. DESCRIPTION	2. TEST
This test shows that in the event of a Primary HA Packet Data Gateway failure, the (ARS) will continue to operate using the Secondary HA Packet Data Gateway to reach its Presence clients. Note: This test applies to IV&D only. During the switchover, some data packets may be lost as the Primary PDG is switched. SETUP RADIO-1 - TALKGROUP 1 RADIO- 1 - SITE - SITE 1 VERSION #1.030	Step 1. Register with Automatic Registration Server (ARS). Step 2. In the vCenter Application or at the Unified Event Manager, verify that the Packet Data Gateway on VMS01 is Primary. Note: for M1 only the single Ethernet link between PDG and GGSN needs to be disconnected Step 3. In the VMWare ESXi Web UI for VMS01, select ‘Reboot’. Step 4. Observe that the Unified Event Manager remains in communication with the Packet Data Gateway 1 and verify Packet Data Gateway 1’s Redundancy state is ‘Active’ using the Unified Network Configurator (UNC) "Quick Commands". Step 5. Observe in the Unified Event Manager the Link Status of the Packet Data Gateway’s common managed links do not change. Step 6. Verify that RADIO-1 remains registered with the ARS. Pass_____ Fail_____

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Primary Core Link Failure - Ethernet Console Site Link

1. DESCRIPTION	2. TEST
This test will demonstrate that in the event of a failure of a link to the Primary Core, the Console Site Router routes packets through the Backup Core to the Primary Core. The Site Control Paths are unaffected by the failure. NOTE: This test is not applicable in a system with combined Core/Exit Router/Gateways. SETUP RADIO-1 - TALKGROUP 1 RADIO-1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO-2 - SITE - SITE 2 CONSOLE-1 - TALKGROUP 1 CONSOLE-1 - SITE - CONSITE 1 Zone Controller 1: Active Zone Controller 2: Standby (Does not apply for M1 DSR) Zone Controller 3: Standby Zone Controller 4: Standby (Does not apply for M1 DSR) VERSION #1.030	Step 1. Initiate a Talkgroup call from CONSOLE-1 on TALKGROUP 1. Verify that RADIO-1 and RADIO-2 receive audio. Step 2. Pull the power cords to both the Core Routers in the Primary Core. Step 3. Observe, in both Unified Event Managers, both the Core Routers in the Primary Core have failed. Step 4. Verify, via the Unified Event Manager (e.g. in the Primary Core), that Zone Controllers 1 and 2, and the Consoles in the site are unaffected by the Console site link outage. The Zone Controller state can also be found using the UNC "Quick Command" feature. Note: For M1 ZC2 is not present Step 5. Initiate a Talkgroup call from CONSOLE-1 on TALKGROUP 1. Verify that RADIO-1 and RADIO-2 receive audio. Step 6. Plug in the power cords to both the Core Routers in the Primary Core. Upon restoration of the link, the Console Site Router routes packets to the Primary Core. Step 7. Initiate a Talkgroup call from CONSOLE-1 on TALKGROUP 1. Verify that RADIO-1 and RADIO-2 receive audio. Pass_____ Fail_____

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Single Ethernet Link RF Site Router Path Failure

1. DESCRIPTION	2. TEST
This test will demonstrate in the event of a failure of an RF Site Router's Ethernet link path to the Primary Core, in a single site router configuration, the RF Site Router routes packets through the Backup Core to the Primary Core. The Site Control Paths are unaffected by the failure. NOTE: This test is not applicable in a system with combined Core/Exit Router/Gateways. SETUP RADIO-1 - TALKGROUP 1 RADIO- 1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO- 2 - SITE - SITE 2 Zone Controller 1: Active Zone Controller 2: Standby (Does not apply for M1 DSR) Zone Controller 3: Standby Zone Controller 4: Standby (Does not apply for M1 DSR) VERSION #1.030	Step 1. Initiate a Talkgroup call from RADIO-1 on TALKGROUP 1. Verify that RADIO-2 receives the audio. Step 2. Pull the power cords to both the Core Routers in the Primary Core. Note: For M1 this is only one Core Router in the primary and one Core Router in the backup core. Step 3. Observe, in both Unified Event Managers, both the Core Routers in the Primary Core have failed. Step 4. Verify, via the Unified Event Manager (e.g. in the Primary Core), that Zone Controllers 1 and 2, Packet Data Gateway1 and the RF sites are unaffected by the RF site link outage. Step 5. Initiate a Talkgroup call from RADIO-1. Verify RADIO-2 receives the audio. Step 6. Plug the power cords in to both the Core Routers in the Primary Core. Note: For M1 this is only one Core Router in the primary and one Core Router in the backup core. Pass_____ Fail_____

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Primary Core Failure - Switchover to Back-up Core (Voice and Data Services)

1. DESCRIPTION	2. TEST
Dynamic System Resilience (DSR) allows a system to continue to function with minimal loss of voice and/or Data communications due to the failure of any controlling master site. This test will demonstrate in the event of a complete Primary Core failure, the Backup Core takes over in order to return the system back to wide area trunking. Some of the Backup Core equipment automatically takes over while the Network Management servers like the Provisioning Manager Server and Unified Network Configurator require manual switchover. Note: This test case applies to the following data services - Trunking IV&D and Conventional IV&D data. The test case can be executed with any or all of the supported data services and should include the appropriate packet data gateways, sites and the radio personalities in the setup of the test case. SETUP RADIO-1 - TALKGROUP 1 RADIO- 1 - SITE - SITE 1 RADIO-2 - TALKGROUP 1 RADIO- 2 - SITE - SITE 1 RADIO-5 - TALKGROUP 1 Mobile Data Terminal (MDT) connected to RADIO-5 UDP Tool installed on both the MDT and Host computers Zone Controller 1: Active Zone Controller 2: Standby Zone Controller 3: Standby Zone Controller 4: Standby Packet Data Gateway 1: Active Packet Data Gateway 2: Standby Unified Network Configurator 1: Active Unified Network Configurator 2: Standby User Configuration Manager: Active User Configuration Manager 2: Standby System Statistics Server 1: Active System Statistics Server 2:	Step 1. Initiate a TALKGROUP 1 call from RADIO-1. Verify that RADIO-2 receives the audio. Step 2. Using RADIO-5 MDT, configure the data application for periodic inbound data messages. (1 message every 30 seconds) Observe at the Host PC that data messages are received. Step 3. Pull the power cords to the Primary Core LAN Switches 1 & 2. (Also the redundant power supply (RPS) if equipped.) Step 4. In the Unified Network Configurator (UNC), select Zone Controllers 1 through 4 and check the redundancy state using the Quick Command feature. (Note: In a single Zone system or when the test is run on the Zone with the primary core system servers the backup UNC will need to be manually enabled to run the quick command.) Step 5. Verify that Zone Controller (ZC) 3 is Active. (Note that the transition of ZC 3 to the "Active" state causes the currently active ZC to reset and the sites will temporarily lose Wide Area Trunking while the connection to ZC 3 is established.) Step 6. In the Unified Network Configurator, select any of the Packet Data Gateways 1 and 2 and check the redundancy state using the Quick Command feature. Step 7. Verify that Packet Data Gateway 2 is Active. Step 8. Initiate a TALKGROUP 1 call from RADIO-1. Verify that RADIO-2 receives the audio. Step 9. Observe at the Host PC that received data messages have continued. Step 10. If the backup servers were enabled for the test, they should now be disabled. Return the system to normal by powering up the core switches. Verify once the Zone Controllers start to communicate only 1 Zone Controller will be active.

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Active VERSION #1.050	Pass_____ Fail_____

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Provisioning Manager and Unified Network Configurator Switchover

1. DESCRIPTION	2. TEST
Configuration management is performed through the Provisioning Manager and Unified Network Configurator (UNC) applications. In a system with DSR, a redundant Provisioning Management Server is added to the backup core of the master site that contains the primary Provisioning Manager. If the system contains more than two master site pairs, the Provisioning Manager (PM) may be located at any one zone's primary/backup master sites. Only one PM/UNC can be active at a time, determined by the network manager or operator. Therefore, one PM/UNC is configured to be in the active state and the other in warm standby state. This test will demonstrate that in the event of a failure of the Provisioning Manager or the Unified Network Configurator in the Primary Core, the Backup Core counterparts can take over in order to continue providing configuration services. This switchover requires the user to de-activate the Unified Network Configurator and Provisioning Manager, and activate both the Provisioning Manager and Unified Network Configurator in the Backup Core. SETUP Provisioning Manager 1: Active Provisioning Manager 2: Standby Unified Network Configurator 1: Active Unified Network Configurator 2: Standby For a M3 Mixed Zone (nonDSR and DSR zones in system). PM 1 and UNC 1 should be placed in a nonDSR zone and PM2 and UNC 2 should be placed in a backup core of a DSR zone. VERSION #1.030	Step 1. Log into the primary and secondary Provisioning Manager Server's Administration Menu. Verify from the Administration Menu that the primary server is "Enabled" and the backup is "Disabled". Step 2. Log into the primary and secondary Unified Network Configurator's Administration Menu. Verify from the Administration Menu that the primary server is "Enabled" and the backup is "Disabled". Step 3. On the primary Provisioning Manager Server's Administration Menu select the option to disable the application. Verify that the server disables from the menu. Step 4. On the primary Unified Network Configurator Administration Menu, select the option to disable the application. Verify that the server disables from the menu. Step 5. Verify that the current Unified Network Configurator and Provisioning Management applications are no longer available on a Network Management client. Step 6. On the secondary (DSR) Provisioning Manager Server's Administration Menu select the option to enable the application. Verify that the server enables from the menu. Step 7. On the secondary (DSR) Unified Network Configurator Administration Menu, select the option to enable the application. Verify that the server enables from the menu. Step 8. From the provisioning manager perform a "Force initialize" on the required devices. Step 9. Verify from a Network Management client that the Unified Network Configurator and Provisioning Management applications are now available, running on the backup servers. (The Motorola application may need to be restarted.) Step 10. Return the system to normal

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	operation. Pass_____ Fail____

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Signoff Certificate

By their signatures below, the following witnesses certify they have observed the system Acceptance Test Procedures.

Signatures

WITNESS: _____ Date: _____

Please Print Name: _____ _____

Initials:

Please Print Title: _____

WITNESS: _____ Date: _____

Please Print Name: _____ _____

Initials:

Please Print Title: _____

WITNESS: _____ Date: _____

Please Print Name: _____ _____

Initials:

Please Print Title: _____

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MOTOROLA SOLUTIONS

City of Fort Lauderdale

Attachment 16 - Contingency Plan

RFP # 549

December 18, 2025

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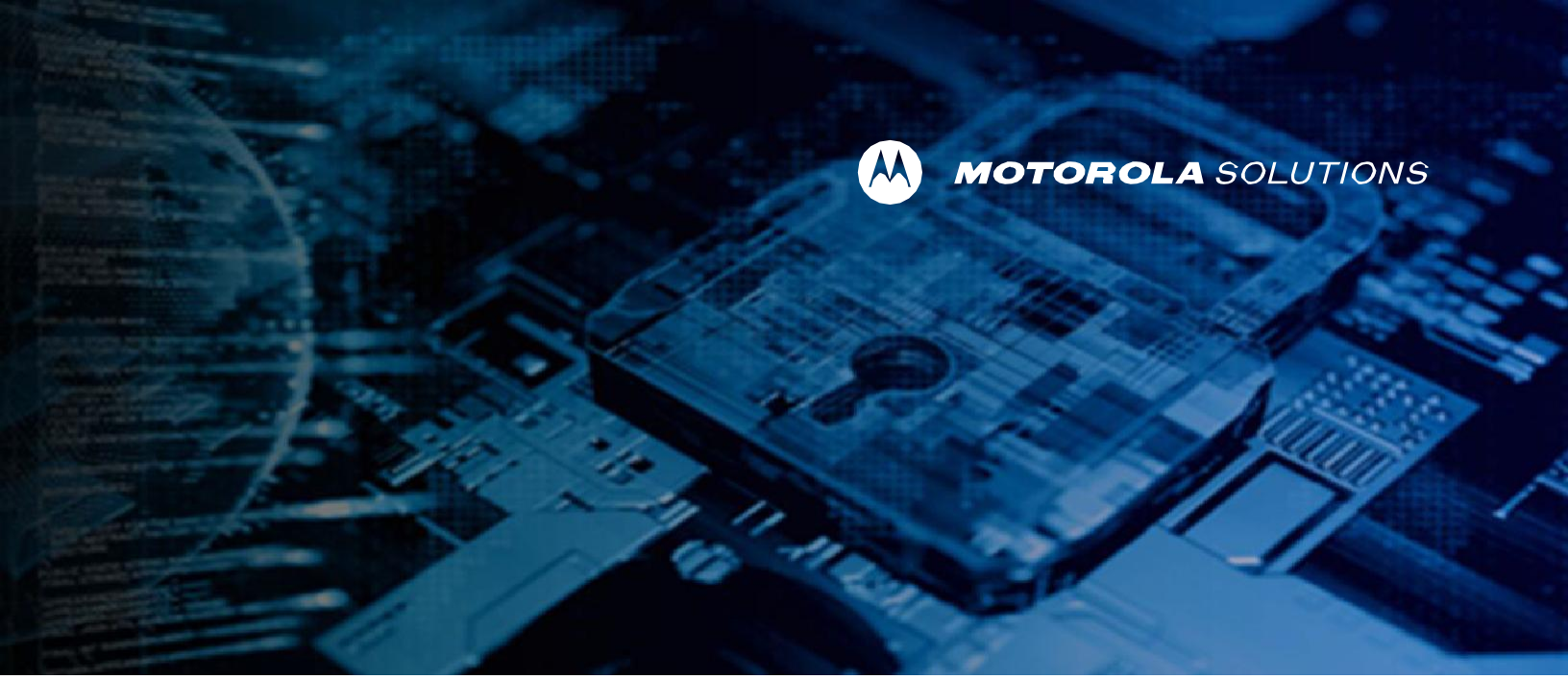
Section 1

RFP Section 3.3.3.8 – Contingency Plan

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

The published Region 9 Regional Planning Committee's Regional Communications Plan already allocates the 26 frequencies listed in Appendix B of the RFP, to the Fort Lauderdale area, and the City already holds FCC licenses for all 26 frequencies. This proposal only calls for the use of 10 of the 26 available frequencies already allocated to the City. While the FCC licenses will need to be modified to reflect the new design parameters and the use of TDMA modulation, there appears to be no risk that the proposed frequency plan will not be available for implementation. The coverage goals of the RFP will, however, require a waiver to the Region's rule which sets a 3-mile limit for the 40 dBu Protected Service Area Contour from the jurisdiction of the City/County.

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Proposal

City of Fort Lauderdale

Attachment 17 – Functional Description of Proposed Broadband Gateway Platform or Solution

RFP # 549

December 18, 2025

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RFP Section 3.14.3.2 ASTRO 25 Solution Description

1.1 Proposed Design and System Description

1.1.1 Why Choose Motorola's ASTRO 25 Technology?

We are proposing to The City of Fort Lauderdale our flagship ASTRO 25 Land Mobile Radio (LMR) system.

ASTRO 25 is the most widely used Project 25 (P25), mission–critical, Integrated Voice and Data (IV&D) communications network for public safety agencies. Installed worldwide, ASTRO 25 solutions meet and exceed IV&D requirements for day-to-day operations, as well as emergency response in the most demanding situations. ASTRO 25 is a wireless platform that combines uncompromising, real-world performance with the legendary reliability of Motorola Solutions.

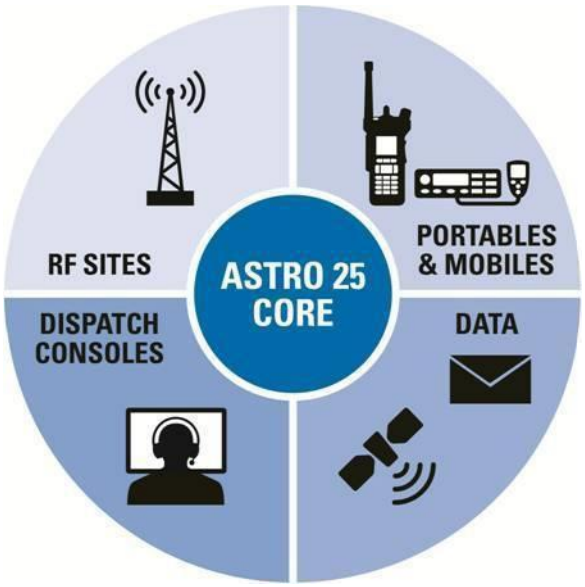


Figure: ASTRO 25 – A Complete Infrastructure for Mission-Critical Communications

Ranging all the way from single-site to nationwide deployments, ASTRO 25 is a flexible, modular network with advanced call processing capabilities designed to meet the needs of public safety and governmental agencies. ASTRO 25 can adapt to accommodate additional users, increased geographic coverage, data applications, and connectivity to other networks—all to ensure an efficient and cost-effective solution for decades to come.

ASTRO 25 is both optimized and hardened for the rigorous demands of public safety operations. When an emergency involves multiple agencies, first responders can share voice

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and data communication among their teams. In addition, centralized command-and-control can deploy resources efficiently, maintain communication security, and track personnel effectively.

1.1.2 ASTRO 25 in the City of Fort Lauderdale

The City of Fort Lauderdale has already been entrusting ASTRO 25 for its P25 radio needs for a decade, and Motorola's predecessor trunked LMR technology even before ASTRO 25 came on the scene. Until now, the ASTRO core has been operated by Motorola at our nearby Plantation facility which is shared with other hosted jurisdictions.

This proposal will provide the City of Fort Lauderdale with its own dedicated Zone Core and backup core. Together with a host of other improvements and updating the City to latest generation of platforms, this proposal will transform The City of Fort Lauderdale's radio-communications infrastructure into a highly dependable, state-of-the-art system, designed to effortlessly handle users' needs, both routinely and in the critical moments that matter.

The offered ASTRO 25 system will operate in trunked, simulcast P25 mode. In a trunked system, voice channels are assigned on demand, from a pool of available channels.

"Simulcast" means – in simple terms – that the same audio is simultaneously broadcast over a common frequency channel from multiple transmitter sites spread across a geographical area. Simulcast lends itself to push-to-talk, fleet-oriented operations such as public safety and public works. It allows a wider area to be covered with significantly fewer licensed frequencies, than would be the case when independent (non-simulcast) repeater sites are employed.

In the proposed City of Fort Lauderdale design, a 10-channel simulcast cell (cluster of RF Sub-sites) is proposed, utilizing four RF Sub-sites.

The proposed ASTRO 25 simulcast system contains four main functional site types:

Zone Core Sites

- The Zone Core site and backup Zone Core Site provide the high-level control of the system, centralized features and services, and the system management capabilities.

Prime Sites

- Prime Sites control the simulcast operations for a cluster of RF sub-sites. They synchronize the transmitted audio sent to, and they compare and vote the audio received from, the multiple sub-sites.

RF (Radio Frequency) Simulcast Sub-sites

- RF Sub-sites use radio repeaters to provide multi-channel, 2-way radio coverage to a localized geographic area and, collectively, to a broad area using a common set of frequency channels.

Dispatch Sites

- Any sites at which dispatcher operator consoles are situated.

For The City of Fort Lauderdale, Motorola proposes:

- A City-owned ASTRO 25 Zone Core.

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- A City-owned ASTRO 25 Backup Zone Core, otherwise described by Motorola as a Dynamic System Resilience (DSR) Core.
- A pair of geographically-redundant Prime Sites to serve the 10-channel simulcast cell.
- Four (4) RF Sub-sites, equipped with ten (10) radio channels each.
- Two (2) Dispatch Sites, equipped with six (6) and eight (8) operator positions respectively.
- A backup control station for each dispatch console (14 in total).

We provide more detail about the operation and configuration of each site type, in the subsections that follow. In addition to physical network sites we also propose a host of other services and offerings to enhance the operational and ownership experience, including:

- Critical Connect for interoperability with other partner agencies and broadband gateway functionality.
- Traditional ISSI capability.
- WAVE PTT broadband device integration.
- ASTRO Connectivity Services for cloud-delivered functionality.
- Motorola's Video Site Security
- Logging Recorder - Eventide
- Ring configuration hot standby protected microwave with MPLS - Nokia

1.1.3 Physical Sites and their Functional Roles

Our proposed design makes use of two (2) tower sites and two (2) rooftop sites, plus two (2) dispatch buildings. Of these: one tower site is already used by the current system and the other is planned to be built by the State of Florida; one rooftop site is already used by the current system and the other is currently being used by Broward County but not currently by the City.

It is very common for more than one (1) functional site type (as described in the previous subsection) to be collocated at the same physical site and this is the case in our proposed design for the City of Fort Lauderdale.

Table: Relationship of Physical Sites to their Functional ASTRO 25 System Roles below associates the functional site types to the physical sites at which they will be situated under our proposal:

Table: Relationship of Physical Sites to their Functional ASTRO 25 System Roles

No.	Physical Site Name	Existing vs. New Structure	Structure Type	Functional Role
1	State of Florida Tower Site	New	Tower	Zone Core Site
				10-channel Prime Site
				10-channel Simulcast RF Sub-site
2	Utilities Tower Site	Existing	Tower	Backup Zone Core ("DSR") Site
				10-channel Geo-Prime Site
				10-channel Simulcast RF Sub-site

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3	Playa del Sol Condominium	Existing	Rooftop	10-channel Simulcast RF Sub-site
4	Point of Americas Condominium	Existing	Rooftop	10-channel Simulcast RF Sub-site
5	1300 West Broward Blvd	Existing	Police Headquarters new building	6-position Dispatch Site
6	2200 Executive Airport Way	Existing	Fire Station and training center	8-position Dispatch Site

Physical sites will be interconnected to one another by MPLS-augmented digital microwave backhaul.

Motorola's proposed and fully-redesigned microwave architecture will replace the City's current microwave system to accomplish the following goals:

- Expands connectivity to encompass the proposed new sites.
- Creates a hot standby ring architecture for the entire system.
- Provides a common throughput capacity of 161 Mbps.

Ring protection means that an alternate transport path is always available to any site on the ring, which will be used automatically, in the event of the failure of any individual microwave hop. The inclusion of MPLS routing technology takes the re-routing of traffic to a new level by providing extremely fast rerouting in the event of a path failure.

When combined with the proposed backhaul connectivity between the physical sites, the City of Fort Lauderdale network will be configured as shown in the figure below:

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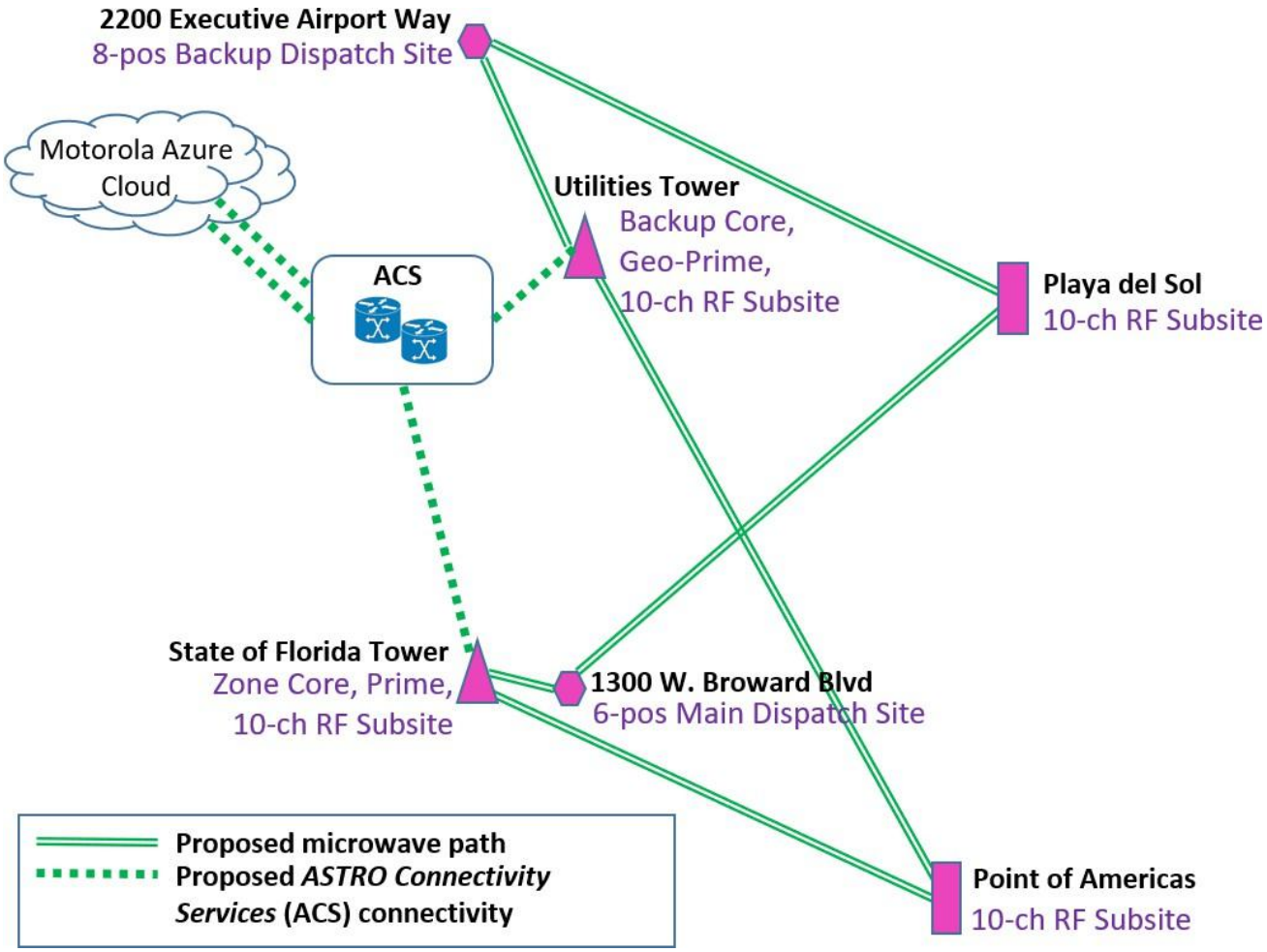


Figure: Approximate Geographical System Layout

The subsections that follow provide a more in-depth explanation of the various sites in the proposed ASTRO 25 system, what roles they fulfill, and how they are specifically configured and equipped for the City of Fort Lauderdale.

1.1.4 Zone Core

The ASTRO 25 Zone Core is the central control point for the operation of the radio communication system.

The term “zone” comes into play because ASTRO 25 architecture can support multiple zones for very large systems such as statewide systems. The City of Fort Lauderdale will have a single-zone system utilizing a single Zone Core and Backup Zone Core (DSR).

In addition to call processing, the Zone Core provides the hardware and software components used for network management and system configuration, as well as to support packet data services. The City of Fort Lauderdale system administrators will have access to the hardware

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and software components that control call processing, network management, and system configuration via four (4) Network Management (NM) Client terminals – one at each Zone Core site and one at each Dispatch Site. Applications that can be accessed from these terminals include Unified Event Manager (UEM), Provisioning Manager (PM), Unified Network Configurator (UNC), Radio Control Manager (RCM) and ZoneWatch.

Motorola has largely standardized on the hardware configuration of its Zone Core offering for new system deployments.

The components in the proposed Zone Core configuration include the following:

- Dual Hewlett Packard Enterprise ProLiant DL 380 Virtual Management (VM) Servers hosting:
  - Zone Controller.
  - Packet Data Gateway.
  - Network Management services.
- HPE MSA 2060 Direct Attached Storage (DAS).
  - Providing storage for the VM Servers.
- Redundant Juniper EX4100 48-port Core LAN Switches.
  - The LAN switches aggregate all the Ethernet interfaces for all servers, clients, and routers at the core.
- Redundant Juniper SRX 1500 Edge Routers.
  - Provide IP routing capability to the Zone Core's LAN architecture.
- Redundant Juniper EX4100 24 Port Backhaul Switches.
  - The Backhaul LAN switches interface the backhaul links to the Prime Sites and to the Dispatch Sites (or the local LAN links in cases where the connected site is collocated).
- Two (2) Nokia SAR-8 MPLS Routers
- DMZ Firewall
  - DMZ stands for De-Militarized Zone, a term appropriated by the computing industry. In an ASTRO 25 system, the DMZ is used to facilitate the creation of a Customer Enterprise Network (CEN). The CEN, in turn, can host certain LAN-connected services that (for security reasons) are not authorized to connect directly into the protected ASTRO 25 Radio Network Infrastructure.
- DMZ Switch
  - In combination with the DMZ Firewall, the DMZ Switch is used to facilitate the creation of a Customer Enterprise Network (CEN).
- GGSN
  - GGSN is a designation that was introduced by the cellular industry and stands for GPRS (General Packet Radio Services) Gateway Service Node. The GGSN supports IP routing for packet data services (i.e. non-voice traffic) in an ASTRO 25 system.
- Border Gateway

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  - Border Gateways create an interface to a Customer Enterprise Network (CEN) (see above).
- TRAK 8835-3M Time and Frequency Clock.
  - The TRAK 8835-3M Time and Frequency Clock is GPS-disciplined, and Rubidium Oscillator-backed to provide extended operation in the event of a GPS system failure.
- NTP Server
  - Synchronizes all Ethernet-based computer systems.
- Terminal Server for Out-of-Band Management.
  - Motorola Solutions, when providing remote technical support, primarily uses the terminal server.
- Internetworking Firewall
  - The Internetworking Firewall comes as a standard part of the Zone Core configuration, and is used to support the WAVE PTX broadband application and other options/applications such as SmartConnect.
- Intersystem Firewall
  - Provided as a standard part of the Zone Core configuration, for support of intersystem connections.

The above components are duplicated at the Backup Zone Core (DSR) location with the exception of the NTP Server, a second MPLS Router, and the Internetworking Firewall.

1.1.4.1 Zone Core Common Server Architecture

The use of a VMware-based Common Server Architecture (CSA) reduces physical space and individual component requirements at the Zone Core. We accomplish this by using on-premises Virtual Management Servers (VMS's) to host multiple server applications, designed for Linux/Windows operating systems, on a single pair of physical computing servers in a Virtual Machine (VM) environment.

The VMS pair hosts the following server applications:

- **Zone Controller (ZC)**—Provides centralized control for call processing and mobility management functions.
- **Air Traffic Router (ATR)**—Captures data exhibited by Affiliation Display, Radio Control Manager (RCM) Reports, and for systems with the Inter-RF System Gateway (ISGW). The ATR also captures foreign talk group and foreign Subscriber Unit Identifier information for ZoneWatch to display.
- **Core Security Management Server (CSMS)**—Provides antivirus service and multi-factor authentication.
- **User Configuration Server (UCS)**—Stores information about user radios, talk groups, critical sites, and security information.
- **Zone Database Server (ZDS)**—Exports infrastructure and subscriber information it receives from the User Configuration Server (UCS) to consoles and site gateways (conventional channel interface).

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- **Zone Statistics Server (ZSS)**—Provides database storage of statistics and back-end processes required for zone-level functions.
- **License Manager**—Stores and manages software licenses.
- **Unified Event Manager (UEM)**—Provides fault management.
- **Unified Network Configurator (UNC)**—Provides controlled and validated configuration management of system devices.
- **Centralized Event Logging Server (Syslog) Server**—Captures Operating System (OS) events generated by most devices in the Radio Network.
- **vCenter Appliance**—Manages all fault tolerant Packet Data Gateways (PDGs) and ATRs.
- **Network Management (NM) Client—Provides a virtual workstation for system administrators and technicians to use for various system-related tasks.**

The space efficiencies enabled by the Common Server Architecture typically allow us to deploy a complete Zone Core within a single 19-inch equipment rack.

1.1.4.2 Zone Core Software Licensing

The table below provides a summary of the Zone Core licenses included in this proposal.

Table: Zone Core Licenses Summary

Nomenclature	Description	Proposed license count	Remark
UA00153AB	P25 FDMA TRUNKING OPERATION SITE	4	One license required per RF site.
UA00159AB	P25 PHASE 2 TDMA TRKNG OP SITE LIC	4	One license required per RF site.
UA00161AA	P25 PHASE 2 TDMA SW BASE RADIO LIC	0	Not required for D Series sites.
UA00162AA	PHASE 2 DYNAMIC CH BASE RADIO LIC	0	Not required for D Series sites.
UA00160AA	PHASE 2 DYNAMIC TG ASGNMT SITE LIC	4	One license required per RF site.
UA00156AA	CONSOLE LICENSES (QTY 5)	3	One license pack required per 5 console or AIS positions.

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Nomenclature	Description	Proposed license count	Remark
UA00152AA	ADD:500 RADIO USER LICENSES	6	One license required per 500 subscribers. Can be used for regular or visiting users.
CA01316AA	UNC ADDTL DEVICE LIC (QTY 10)	10	Quantity determined by calculation tool based on system design.
UA00225AA	UEM ENHANCED NAVIGATION	1	Only 1 of this license is required per system.
UA00146AA	UNIFIED EVENT MANAGER (UEM)	4*	* *1st license is included with Zone Core purchase.* Each license allows one concurrent session of this application.
UA00147AA	PROVISIONING MANAGER	1*	* *1st license is included with Zone Core purchase.* Each license allows one concurrent session of this application.
UA00136AA	UNIFIED NETWORK CONFIGURATOR (UNC)	1*	* *1st license is included with Zone Core purchase.* Each license allows one concurrent session of this application.
UA00149AA	RADIO CONTROL MANAGER	1	Each license allows one concurrent session of this application. While not mandatory, Motorola has included this to enhance the City's experience with the system.
UA00141AA	ZONEWATCH GRID & CTRL	1	Each license allows one concurrent session of this application. While not mandatory, Motorola has included this to enhance the City's experience with the system.
UA00138AA	FLEXIBLE ATIA	1	Only 1 of this license is required per system. While not mandatory, Motorola has included this to enhance the City's experience with the system.
CA01724AK	BACKUP AND RECOVERY (BAR)	1	Only 1 of this license is required per system. While not mandatory as Baseline Backup comes as standard, Motorola has included this to enhance the City's experience with the system.
UA00005AA	ISSI Automatic Roaming License (for first system)	1	

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Nomenclature	Description	Proposed license count	Remark
UA00006AA	ISSI +10 Additional Simultaneous Talk Group Capacity License	1	UA00005AA license provides for up to 10 simultaneous talk groups. UA00006AA adds another 10 simultaneous talk groups.

1.1.5 Prime Sites

A Prime Site is the heart of the simulcast/voting system, acting as a control and digitized audio center for the simulcast subsystem.

Simulcast operation relies on the ability to choose the best received signal from multiple sites and retransmit without causing interference. The ASTRO 25 Virtualized Prime Site compares real–time audio from multiple sites and aggregates the highest quality audio frames to pass on. It then synchronizes each transmitter to mitigate interference and ensure the best quality audio is received at the subscriber radio.

The ASTRO 25 Virtualized Prime Site is a fully on-premises prime site configuration. Software virtualization enables one physical hardware unit to run multiple virtual machines, thereby creating a high-availability architecture in a small and easy-to-manage form factor while dramatically reducing the hardware requirements. All the equipment, including processing, networking and timing, occupies only half of an equipment rack.

To enhance the City of Fort Lauderdale's simulcast resiliency, geographically redundant ASTRO 25 Virtualized Prime Sites are included in the proposed system to maintain wide-area simulcast communications even after the catastrophic loss of a simulcast prime site. If the main prime site becomes unavailable, the system will automatically restore wide-area operation through the secondary prime site. In the event of a hardware or software failure, the geo-prime site will take over to maintain full service and site capacity.



Figure: Typical Virtualized Prime Site Rack

What's more, channel processes are level loaded across available hardware, thereby distributing the load and minimizing any disruptions caused during a switch.

The simulcast Prime Sites will communicate with the simulcast RF Sub-sites over a microwave IP transport network.

Motorola Solutions proposes to collocate the 10-channel Virtualized Prime Site in the proposed State of Florida tower shelter, and the 10-channel Geo-prime Site in the Utilities tower shelter.

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The simulcast geo-redundant prime site configuration provides geographically separated redundancy to key equipment components, such as prime controllers, prime backhaul switches, prime gateways, and virtualized voting comparators. The redundant components between these two (2) prime sites will eliminate single points of failure, as well as to protect against the complete failure of one (1) of the sites, thus preventing the loss of simulcast operation in the radio system.

Each Virtualized Prime Site will contain the following components.

- One (1) 19-inch open rack.
- Two (2) Prime Site Controllers for localized redundancy.
- Virtualized Comparators (running on the above Site Controllers), licensed for ten (10) radio channels.
- One (1) Prime Backhaul Switch.
- One (1) SRX-1500 Prime Access Router.
- Nokia SAR-8 MPLS Router – shared with the collocated core and RF sites.
- Integrated GPS-disciplined and Rubidium oscillator-backed Frequency and Time Source.

The deployment at each location will include redundant Site Controller configurations, meaning that four controllers will be deployed for simulcast operation (two per location). Any single controller can support simulcast operation for all of the channels proposed to the City of Fort Lauderdale, so this essentially offers a four-fold level of redundancy from a Site Controller failure.

The Virtualized Prime Sites are maintained through a single, secure login to access the configuration and diagnostics for all channels. Software updates are streamlined and can be performed without any reduction in service. Should the City desire to add more channels in the future, software-only channel expansion capability means no incremental hardware to ship, mount, or cable for capacity increases up to 18 total channels. An additional pair of Site Controllers would be added to accommodate more than 18-channels.

1.1.6 RF Sites

The purpose of an RF Site is to provide two-way radio repeater coverage to a geographic area.

An RF Site can be thought of as synonymous with the term “tower site” (or other antenna-supporting structure such as a high-rise rooftop). All of the proposed RF Sites for the City of Fort Lauderdale are existing tower or rooftop sites already owned or leased by the City, or are new locations that the City has already earmarked for use. In other sections of our proposal, we may interchangeably refer to these RF Sites as RF Sub-sites, Remote RF Sites, or tower sites.

All of the RF Sites in this proposal fall under the category of Simulcast RF Sub-Sites. This proposal does not contain any Non-simulcast RF Repeater Sites, with the exception of the single-site mutual aid capability discussed later.

RF Sites in this proposal will be furnished in Motorola’s new, leading edge “D Series” RF Site configuration.

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1.1.6.1 Simulcast RF Sub-Sites

RF Sub-site is the nomenclature we use to describe an RF site that belongs to a simulcast cell (cluster of sub-sites) under the control of a Prime Site (or, in the City of Fort Lauderdale's case, Geo-Redundant Prime Sites).

Motorola Solutions proposes four (4) RF Sub-sites to deliver a high level of RF coverage and building penetration throughout the tri cities of Fort Lauderdale, Wilton Manors and Oakland Park that exceeds some of the RF requirements mentioned in the RFP.

This section will focus on site configuration, while coverage considerations are addressed in Attachment 18 – 3.4.15.5 Configuration Diagrams & Coverage Maps our proposal.

The equipment configuration of each RF Sub-site is mostly identical, apart from the choice of antenna models (picked to maximize, optimize and harmonize the coverage footprint from each site), and the lengths of coaxial cable required to reach the antennas.

The following major equipment will be furnished at each of the 10-channel simulcast RF Sub-sites proposed for the City of Fort Lauderdale:

- Ten (10) Transceivers: supporting one (1) control channel and nine (9) voice or data channels. TDMA and Dynamic Channel Assignment capabilities have been included on four (4) channels per site, to allow automatic switchover between TDMA and FDMA operation when required, on the channels so equipped. Other voice channels will support FDMA operation. This configuration will support a maximum of thirteen (13) voice paths when all dynamic channels are operating in TDMA mode.
- Five (5) additional transceivers at the State of Florida tower site only, as required for mutual aid (see section 1.1.6.4 of this Solution Description).
- An additional transceiver per rack for N+1 transceiver redundancy on trunked channels. This is a new feature introduced with the D Series product and will enhance the channel resiliency for the City.
- Redundant SRX-345 Site Routers.
- Integrated timing reference with redundant GPS Receivers and Rubidium clock for extended (72 hours) holdover in the event of a loss of GPS signal.
- Redundant DSC 8500 Site Controllers.
- Eltek Trilogy DC Power System providing at least eight (8) hours of battery backup for LMR equipment (meaning the RF Sub-site, but also powering the Zone Core or Backup Zone Core and Prime Site where collocated).
- One (1) transmit antenna and coaxial line. A second transmit antenna and coaxial line has additionally been included at the State of Florida tower site for 800 MHz mutual aid channels.
- One (1) receive antenna and coaxial line, and a TTA test line.
- Multi-Carrier Power Amplifiers (MCPA's) in the quantity determined by Motorola's engineering rules for the channel count (including any mutual aid channels) at the site.
- One (1) Receive Tower-Top Amplifier (TTA) System paired with an indoor Control Unit.
- One (1) MC-Edge Network Fault Monitor Unit equipped with three (3) punch-down blocks.

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- One (1) MCG 8000 Conventional Channel Gateway (CCGW) equipped for eight (8) ports, for the City's existing or future conventional devices such as control stations to be connected, making any connected device accessible from the dispatch consoles as conventional resources. At the State of Florida tower site, five of the eight ports on this CCGW will be used to connect the proposed mutual aid channels.
- One (1) Nokia SAR-8 MPLS Router, except where the RF Sub-site is collocated with, and can share an MPLS Router with, a Core and Prime Site (see Section 1.1.8.5 of this Solution Description for details).

1.1.6.2 D Series Radio Site

Mission-critical communications is paramount to the City's needs and modern radio sites are a key component to delivering on that need. The D Series Radio Site integrates the key ASTRO radio site components into a single, easy to deploy unit. Built on the flexibility of modern hardware and software architectures, the D Series is designed to minimize downtime, and provide ease of operation while allowing for cybersecurity updates.

The D Series Radio Site contains the site processors, transceivers, RF distribution systems and DC power distribution for up to 12 carriers (12 FDMA or 24 TDMA talkpaths) in a single rack. Multiple racks can create a site with up to 28 site repeater carriers or 30 simulcast carriers. D Series sites can support up to 12 carriers per transmit antenna and up to 30 carriers per receive antenna.

The D Series Radio Site can support both 700 MHz and 800 MHz frequency bands if required.



Figure: D Series Radio Rack

Proposed Configuration

For the 10-channel simulcast sub-site at the State of Florida tower location, we are proposing the following rack configuration:

- Rack 1: Ten (10) channels feeding transmit antenna #1, and an 11th standby transceiver for N+1 redundancy.
- Rack 2: Five (5) mutual aid channels feeding transmit antenna #2.
- Rack 3: TTA Control Unit, MC-EDGE Network Fault Manager, punch blocks, MCG 8000 CCGW.

For the 10-channel simulcast sub-sites at Utilities, Playa del Sol and Point of Americas, we are proposing the following rack configuration:

- Rack 1: Ten (10) channels feeding one transmit antenna, and an 11th standby transceiver for N+1 redundancy.
- Rack 2: TTA Control Unit, MC-EDGE Network Fault Manager, punch blocks, MCG 8000 CCGW.

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Improving Uptime

The D Series Radio Site is designed to minimize downtime from failure, maintenance or site updates. The D Series Radio Site can dynamically allocate resources across available hardware, thereby improving resiliency and overall uptime. Critical functions are deployed in pairs so that a redundant component can take over functions if needed. The major hardware components of the D Series site are hot swappable to ensure repairs cause minimum disruptions.

The multicarrier power amplifier (MCPA) bank amplifies all channels simultaneously from a pool of amplifier resources. Upon a Power Amplifier (PA) module failure, the remaining MCPA modules can continue to service the channels. And depending on the configuration and transmit power requirements, this can be with no loss in channel capacity or no more than one (1) channel lost. The multicarrier amplifier architecture enables an N+1 transceiver redundancy architecture. N+1 transceiver (XCVR) redundancy equips each bank of MCPA's with an extra XCVR module. Upon a failure of one (1) of the XCVRs, the idle XCVR will tune to the frequency of the failed channel and take over. This effectively restores full channel capacity of the site without a site visit to manually replace a failed XCVR (some restrictions apply). N+1 transceiver redundancy has been included in our proposal for the trunking channels.

Simplifying Ownership

Offering expandability for up to twelve (12) carriers per rack, D Series can reduce the impact on space-constrained sites and ease channel expansions within the capacity of the unit. The built-in Radio Frequency Distribution System (RFDS) of multicouplers, preselectors and filters connects the D Series site to the receive and transmit antennas.

With a narrow adjacent frequency spacing requirement of only 50 kHz within the same bank of transceivers, the D Series site offers greater flexibility than typical 150 kHz equipment, easing frequency acquisition where spectrum availability is an issue. This reduced frequency spacing has allowed Motorola to propose to the City of Fort Lauderdale an optimal pick of FCC channels that do not have any nearby incumbents, while simultaneously allowing all channels to be housed a single D Series rack.

The redundant DSC 8500 Site Processors each provide a single point of connectivity for all of the D Series components at the site. Configuration, fault management, and software upgrades are managed at the site level, rather than addressing each component individually.

Modernizing Cybersecurity

D Series is designed to offer protection against an ever-evolving threat landscape following recommendations of the NIST Cybersecurity Framework guidelines to help identify and detect cyber-attacks, and then how to respond, prevent and recover from such events.

Key D Series Components

DSC 8500 Site Processor – The site processor contains and runs the software used throughout the radio site, including the site controller and base radios. Connections to the base radio transceivers and PAs are provided via the integrated IP switch which has additional capacity for connecting external RF equipment at the site such as conventional stations. The site processor will be equipped with integrated redundant GPS references and a rubidium module, providing an extended holdover time of 72-hours in the event of loss of GNSS signal.

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Multicarrier Amplifier Bank – The D Series site pools PA resources into a multicarrier amplifier bank. PA resources within this bank can be sized to provide ample power for the active carriers as well as additional capacity to cover for a PA failure in many channel configurations. The bank dynamically amplifies all channels simultaneously. The multicarrier amplifier bank eliminates the need for traditional cavity combiners. The overall result is a small and power efficient system, resilient to failure without the need for periodic combiner tuning.

DC Power System –D Series offers integrated DC power as standard (- 48 VDC) throughout. Designed to be powered by a site DC power system, the D Series rack includes multiple breakers to distribute power to the various components, ensuring a single breaker trip won't disable the entire site.

1.1.6.3 Conventional Mutual Aid Repeaters

Our proposal includes conventional repeaters as summarized below:

- State of Florida Site
  - Five (1) 800 MHz analog FM mutual aid channels.

1.1.6.4 Redundant Juniper SRX-345 Site Gateways

The various Juniper gateways employed throughout an ASTRO 25 system provide routing control of audio, data, and network management traffic for devices that forward packets beyond their local LAN. The gateways replicate packets while achieving the fast access levels required by real-time voice systems.



Figure: SRX-345 Site Gateway

The Juniper gateways used at the RF Sub-sites are known as the Site Gateways. Redundant Site Gateways are proposed for the City of Fort Lauderdale's system. Together, the two Site Gateways facilitate the use of alternate transport paths back to the Zone Core.

1.1.6.5 Redundant DSC 8500 and DSC 8000 Site Controllers

At the prime sites, DSC 8000's are used as the Site Controllers for the simulcast cell. At the RF Sub-sites, DSC 8500's serve as redundant distribution modules for providing GPS-receiver-disciplined frequency and timing references to the Transceivers. They also provide high-availability LAN switching for the RF Sub-site (see below).



Figure: DSC 8000 Controller

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1.1.6.6 Redundant, High-Availability Site LAN Switching and Channel Processing

At the proposed RF Sub-sites and RF Repeater Sites, high-availability LAN switching and Channel Processing is performed by two (2), redundant DSC 8500's. This is a significant reliability improvement over traditional RF site architecture involving off-the-shelf LAN switches, where if one switch failed (even if "redundantly paired"), any channel connected to the failed LAN switch would go out of service (typically 50% of the channels). High-availability LAN switching avoids this scenario, since either DSC 8500 will take over the entire switching and Channel Processing needs of the RF Sub-site if the other DSC 8500 fails, within about one minute.

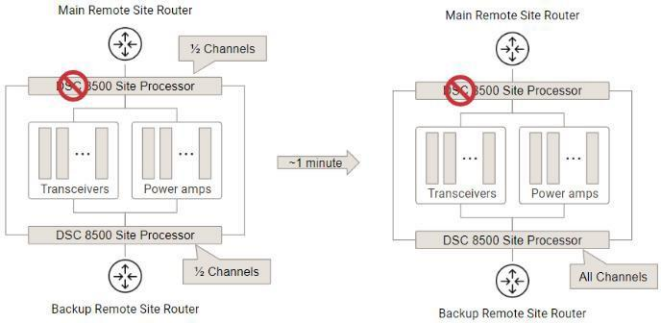


Figure: DSC 8500 Redundancy

The importance and benefit of high-availability switching cannot be understated in a simulcast system, where the failure of any channels at one RF Sub-site would generally require the withdrawal from service of the same channels at the other RF Sub-sites. High-availability switching makes multiple channel failure much less likely.

1.1.6.7 DC Power System

At all RF sites, the DC power system will power all components of the RF Site, as well as collocated Prime or Geo-Prime Site equipment and Zone Core or Backup Zone Core equipment where applicable. Items not capable of natively receiving DC power will be powered from the DC power system via a DC-to-AC inverter system: this includes most zone core equipment and LAN switches where used. Motorola Solutions has included a Delta (Eltek) DC power solution to provide at least 8 hours of battery backup operation for the LMR equipment, and (via separate DC system) 48 hours of operation for the microwave and MPLS equipment.

Trilogy with Smartpack S

The Eltek Trilogy DC power system, powered by the Flatpack2 line of power modules, brings significant DC power to applications where space is limited. Use of the highly efficient and reliable Flatpack2 rectifier, remarkably flexible distribution, and the advanced Smartpack S controller make for optimal system design and cost effective deployment.



Figure: Typical Eltek Trilogy DC Power System

The distribution section features unique circuit breaker holders that facilitate at-will assignment in the field to one of two output buses. Bulk cable connections are available in the rear of the distribution. All cabling is vertical, further reducing horizontal space demands. The Eltek Trilogy system will be installed inside an enclosed cabinet per the RFP requirement.

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Rectifier Modules

The Flatpack2 40/2000 HE Rectifier Module offers an efficiency up to 96.5%, which reduces losses by 50% compared to the current industry standard. The plug-and-play design means that when a new rectifier is plugged into the system, it automatically logs on, gets an assigned ID, downloads the system set parameters from the control system, and starts up with a minimum of installation time, and without interrupting the system or attached equipment.

Rectifier modules have been provisioned for load sharing with “N+1” redundancy. This means that any rectifier can fail and there will still be enough rectifiers to power the maximum DC load of the site, plus the maximum battery charging current for a 24-hour recharge cycle.

Batteries

At 10-channel Simulcast Sub-sites, proposed batteries collectively provide the following ampere-hours of capacity from a pair of free-standing battery banks:

- State of Florida tower site: 4,000 ampere-hours.
- Utilities tower site: 2,210 ampere-hours.

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

- Playa del Sol site: 1,190 ampere-hours.
- Point of Americas site: 1,190 ampere-hours.

1.1.6.8 Radio Frequency Distribution System

The Radio Frequency Distribution System (RFDS) connects the D Series rack bulkhead with antennas. For the transmitter path, this includes a lightning arrestor, and coaxial cabling. For the receiver path, this includes tower-top amplifier, TTA Control Unit, lightning arrestor and coaxial cabling.

In the D Series product, some elements that were traditionally part of the RFDS are now integrated into the DBR rack itself; this includes combining (although the DBR’s Multi-Channel Power Amplifier design eliminates the need for traditional cavity combiners), transmit filtering, and internal receive multi-coupling.

Tower-Top Amplifier (TTA) System

Each site in the proposed system will be equipped with TxRx’s latest “440” series of TTA system. This system was developed to meet new and demanding specifications issued by Motorola Solutions in 2018, aimed at creating a new generation of highly capable, robust TTA systems for our LMR deployments. Each TTA system incorporates redundant amplifiers in the tower-top units, a graphical user interface, and a test line capability.

Designed to pair with the TTA, a Control Unit completes each TTA system. The Control Unit provides a single feed to the D Series rack or cabinet, which then distributes the receive signal to individual transceivers via the Site RMC and Cabinet RMC that are integral to the D Series product itself.

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Figure: TxRx Tower-Top Amplifier and Indoor Control Unit

PIP and PIM-Rated Antennas

For RF Site antennas, Motorola Solutions has proposed only preferred antennas from our vetted manufacturer, dbSpectra, who certifies its antennas for Peak Instantaneous Power (PIP) and Passive Inter-Modulation (PIM) performance. PIP rating is important to prevent premature failure from the very high peak power levels that can be generated in an LMR system, where a number of channels are presented to the same transmit antenna. PIM rating ensures a high quality of antenna design that aims to eliminate mixing points that could lead to intermodulation products.

1.1.6.9 MC-Edge Network Fault Monitor

The MC-Edge Network Fault Monitor enables the Unified Event Manager (UEM) to acquire information regarding the fault and configuration of elements/devices at RF sites (typically, those that are not IP-connected and SNMP-enabled) through a collection of digital and analog inputs accessible through punch blocks.



Figure: MC-Edge NFM

Each MC-Edge will come equipped with 3 programmable input/output modules, each supporting 16 digital (i.e. 2-state) wet or dry inputs and 8 digital outputs per module, for a total of up to 48 inputs and 24 outputs. (“Wet” meaning a voltage is presented by the device being monitored, and “dry” meaning dry contacts such as a relay closure or door sensor reed switch are being monitored.) When deployed at RF sites, an additional input module is included with a further 12 digital wet inputs and 8 analog inputs. An example of the use of analog inputs would be the monitoring of generator fuel level, for fuel tanks that are suitably equipped with the necessary sensors.

1.1.6.10 MCG 8000 Conventional Channel Gateway

Conventional Channel Gateways (CCGWs) connect dispatch operators (via the IP network) to analog or digital conventional channels in the system. A CCGW provides the local interface at the location where the conventional station is situated. A CCGW has been included at each RF Sub-site to support conventional stations that the City may own or wish to connect in the future. CCGW ports are enabled via software licensing; each CCGW in this proposal will come with licenses for eight (8) ACIM/analog (or analog-only) ports.

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At the State of Florida site, five ports on the CCGW will be consumed by the proposed Mutual Aid channels at that site, leaving three ports for other uses.

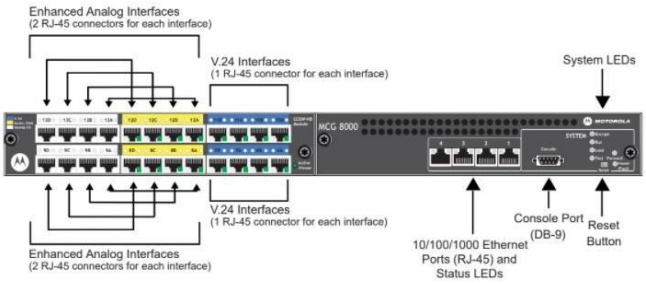


Figure: MCG 8000 CCGW

1.1.7 CommandCentral AXS Dispatch Sites

1.1.7.1 AXS Overview

Motorola Solutions, Inc.'s (Motorola) CommandCentral AXS Dispatch Console reduces the barriers between systems in the City's dispatch centers, allowing access to all the mission-critical tools and applications dispatchers need in the moments that matter. This makes operation more efficient in emergency situations. Resources are accessible with an intuitive, highly configurable browser-based GUI. Dispatchers will have an expansive feature set and a mission-critical IP network for transporting information and calls throughout the system.

CommandCentral AXS improves the efficiency and operation of dispatchers in the following ways:

- **Next Generation Dispatch Experience** – The solution responds to touch, type, or click, giving dispatchers the flexibility to interact and stay connected to teams in the way that best suits them. Extensive configuration options, flexible deployment configurations, and simple scalability means agencies only pay for what is needed now, with the room to adapt and grow as needs change over time.
- **Purpose-Built Dispatch Console Accessories** – Enhances the dispatch experience with accessories, such as gooseneck microphone, speakers, headset jack, and footswitch, designed and tested for industry-leading performance and reliability.

This solution also reduces operating costs and provides a smaller physical footprint in the command center without compromising on features or reliability. This combination of seamless communications, modern architecture, and advanced integration capabilities enables the CommandCentral AXS solution to scale and evolve as needs change over time.

Integration with the ASTRO 25 Network

The proposed dispatch console seamlessly integrates into the City's proposed ASTRO 25 system for an integrated, mission-critical network. This tight union between radio infrastructure and console equipment has several operational benefits to the City of Fort Lauderdale. The physical space to accommodate the proposed console is comparable to that required for a personal computer.

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The console can access both trunked talk groups and conventional radio channels over the same network. This architecture reduces overall transport costs and the need for duplicate fixed network equipment.

LAN Switches

LAN switches provide LAN interfaces for console site equipment and a LAN port for the link to the core site. Service technicians can access the system's configuration manager and service the equipment through the switch.

Advanced Conventional

This capability provides the dispatcher with the ability to control ASTRO 25 conventional channels.

Conventional Base Station Interfaces

The proposed consoles will be able to access and control the City's conventional base stations through the use of Conventional Channel Gateways (CCGW). The console processes audio received from the station and controls various features on compatible stations, such as frequency selection, private line selection, and repeater on/off.

Additionally, the CCGWs allow for recovery of digital signaling, such as unit ID and emergency alarm.

1.1.7.2 Making Consoles Easy to Operate

Motorola's proposed consoles are optimized for real-time audio, prioritizing emergency calls over other traffic, and minimizing voice queuing. Using robust error mitigation to maintain call quality even when the system is heavily loaded, the proposed console reduces communication errors that may force dispatchers or radio users to repeat their transmissions.

Next Generation Dispatch Experience

CommandCentral AXS features a highly configurable graphical user interface (GUI) that provides quick, single-view access to important information and functionalities. The browser-based GUI's versatile folders, tabs, and scalable resources allow users to organize and configure their dispatch experience and make engagement more familiar and intuitive from shift to shift. Folders and tabs can be relocated, exposed, or overlapped as needed, giving dispatchers more control of what information they see and how they interact with those resources. CommandCentral AXS also offers multiple options for routing audio to speakers and controlling volume levels.

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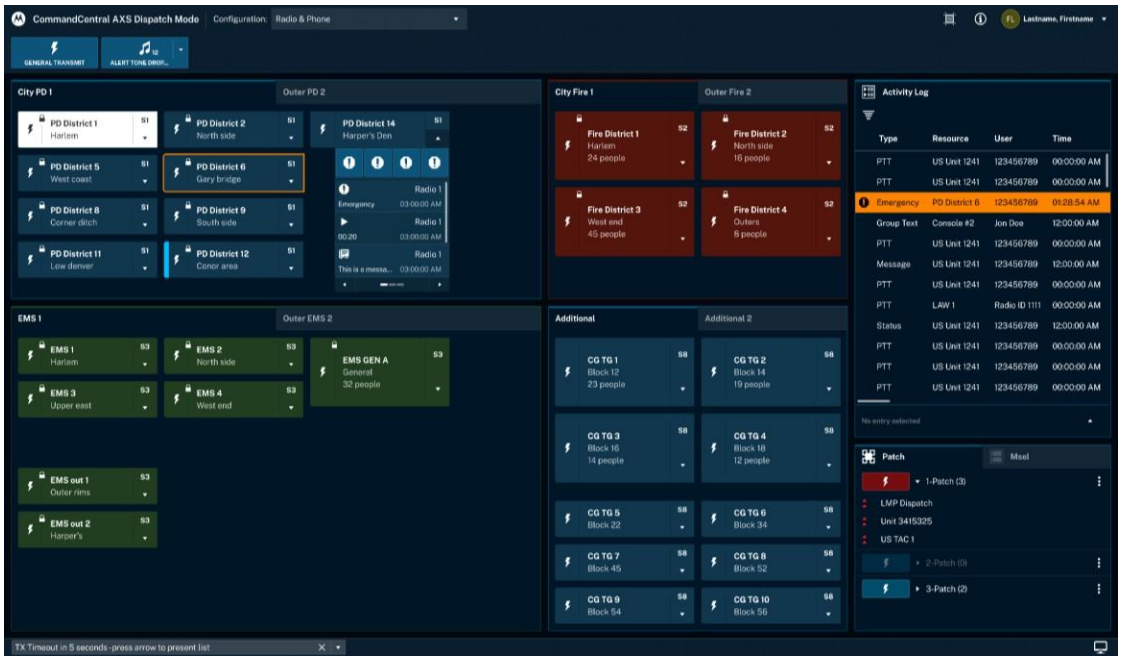


Figure: Next Generation Dispatch Experience

CommandCentral AXS features flexible window positioning and capabilities for quick and efficient access to services such as:

- **Activity Log** – Provides an efficient point of reference for all incoming calls into a dispatch console , showing dispatchers detailed, searchable call information (radio resource name and call time) to enable faster and more informed response.
- **Paging** – Allows users to send user configured pages on radio resources. This flexible paging feature is integrated with CommandCentral AXS for both conventional and trunked radio resources, while an external paging encoder port on the CommandCentral Hub enables third-party paging encoders to send pages on the selected radio resources.
- **Patch Capabilities** – Enables dispatchers to set up a communication path between two or more resources that are normally unable to communicate with each other, such as trunked resources and conventional resources.
- **Alert Tones** – Allows dispatchers to send one of fifteen user-configurable alert tones on selected radio resources. Fifteen default .wav files are provided with the dispatch console software, but any combination of these default files may be replaced with user configured.wav files to meet specific needs.
- **Channel Marker** – Enables dispatchers to send a periodically repeating piece of audio on radio resources to meet the specific needs.

Cross Platform Dispatch Capabilities

This solution is designed to take full advantage of Motorola's end-to-end software suite, CommandCentral. These cross platform integrations enhance the dispatch capabilities of CommandCentral AXS.

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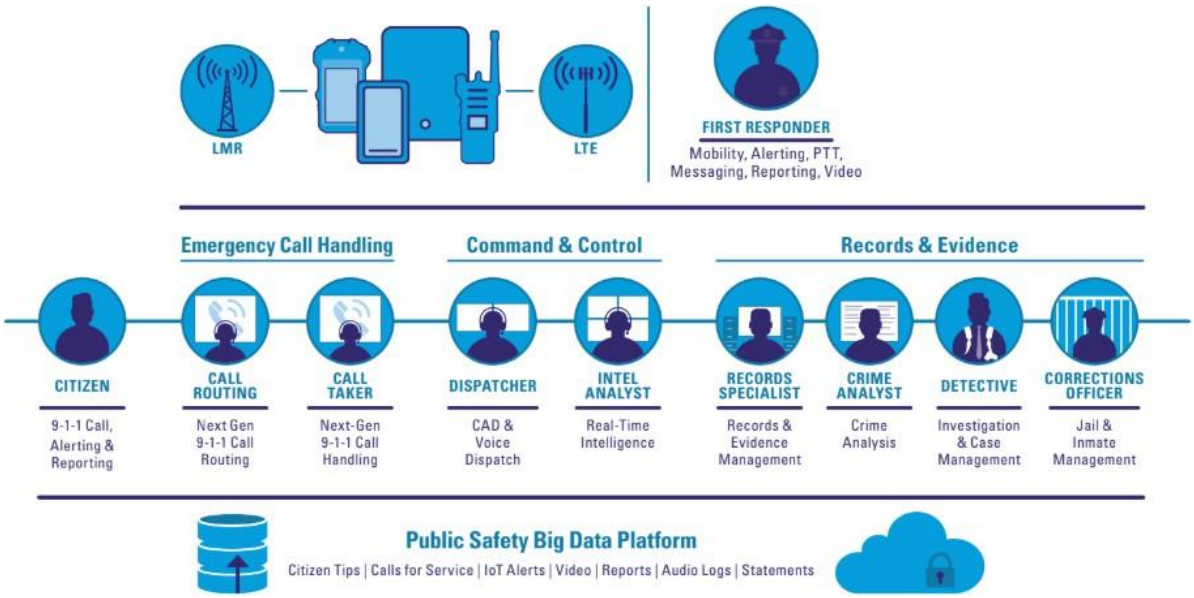


Figure: Motorola's End-to-End Portfolio

CommandCentral AXS is an integral part of our end-to-end portfolio, providing greater interoperability and support for the City's current and future investments. As needs grow and change over time, this solution's flexible integration capabilities evolve to satisfy new demands. This adaptability also enables dispatchers to be effective with the integrations and capabilities they need.

Headset Sharing

CommandCentral AXS supports Headset Sharing, which enables a dispatcher to use a common headset for both radio and 911 communications and to quickly access basic 911 call taking functionality from CommandCentral AXS. This improves the dispatcher's efficiency and accuracy when they have to concentrate on the radio dispatch GUI while handling 911 calls.

Auxiliary Inputs/Outputs

The proposed console supports Global Auxiliary Inputs/Outputs (Aux I/Os) for remote status indications or remote control through dispatch positions. Global Aux I/Os are typically implemented by hardware that is independent of the dispatch positions in a system and may be accessible to multiple dispatch positions. Aux I/O Servers provide the Aux I/O feature for the consoles.

Locally (or "Private") Aux I/O capability is also available at the dispatch console itself, and this will be used to drive one of the colors within the status light pole requested in the RFP, to signify an active radio transmission.

Standard Radio Transmission and Reception

A typical proposed dispatch position supports a City-provided headset and has two speakers. One speaker is for selected audio and the second speaker is for all remaining unselected audio. Optional additional speakers can be added to a console allowing dispatchers to configure a

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specific speaker for a set of designated audio sources. This simplifies multitasking between multiple audio sources and allows flexibility in the way the audio is presented to the dispatcher.

Receiving Calls from the Field and Other Dispatchers

The proposed console provides dispatchers with greater flexibility in how to hear calls from field radio users and other dispatchers. Each dispatcher can define his or her own audio reception profile by selecting a single audio source, whether conventional or talk group, to be heard on a selected speaker or headset (Single Select). The dispatcher can also define groups of radio resources that can all be heard on a selected speaker or headset (Multi-Select).

Initiating Calls to the Field and Other Dispatchers

The dispatcher has several different ways of initiating a call. In most circumstances, a General Transmit is appropriate. With the General Transmit, the dispatcher selects a resource on the console and activates the transmission through a footswitch, headset transmit button, or a microphone transmit button. If the dispatcher needs to quickly transmit on a resource that is not selected, the dispatcher uses the Instant Transmit function.

A safety switch is available, which prevents accidental activation of functions that may cause negative consequences. The safety switch can be used with Aux I/Os and preprogrammed pages, as well as Instant Transmit switches.

Audio Communication to the Field and Other Dispatchers

The dispatcher can transmit audio in different ways. They can make calls to all users listening to a specific conventional radio resource or a specific trunked talk group. When multiple resources are required, the dispatcher can select additional talk groups and/or conventional channels, as needed using the Multi-Select feature.

The proposed console also enables dispatchers to make private calls to individual field radio users or dispatchers. Once a private call is established, it can be patched in with another resource at the dispatcher’s discretion.

Controlling Console Audio

The proposed console offers dispatchers several different ways of controlling or muting the audio on their consoles, such as the following:

- Audio volume can be changed for any specific resource.
- All non-selected resources on the console can be muted for 30-seconds (All Mute) or unmuted, if already muted.
- A dispatcher can transmit on a resource while receiving audio from the same resource or other resources.
- A dispatch position can be configured to automatically mute the other dispatch audio on a shared resource to prevent acoustic feedback when a co-located dispatch position transmits.
- RF Cross Mute automatically mutes the receive audio from a specified channel when the dispatcher transmits on another specified channel to prevent acoustic feedback.

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Controlling Network Audio

Dispatchers can control audio on the ASTRO 25 network. The dispatcher can enable or disable radio users to compartmentalize traffic, reduce interruptions, and maintain communications between dispatch and the field. When this function is enabled or disabled, all dispatch consoles with this resource assigned are updated with the current status of the feature. This feature can be controlled from any dispatch position.

Emergency Radio Transmission and Reception

As part of a mission-critical communications network, the proposed dispatch console facilitates immediate prioritization and resolution of emergency communications between the City's dispatch and first responders in the field. This enables dispatchers and first responders to focus on their mission and not their equipment, especially during critical situations.

Receiving an Emergency Call

When a user in the field or another dispatcher initiates an emergency call, the console emits both visual and audible indications (Emergency Alarm). The audible indication alerts the dispatcher that an emergency is underway; the visual indication directs the dispatcher's attention to the specific resource making the emergency call. The dispatcher can immediately reserve a voice channel for the duration of the emergency.

Responding to an Emergency Call

A dispatcher can bypass the standard console interface to auto-open a quick list, which contains specific controls for recognizing an emergency call, initiating an emergency call, and ending an emergency call (Auto-Open of Quick List). The dispatcher can then recognize the emergency call, which ends the audible emergency indication and notifies all dispatchers that the emergency is being addressed (Emergency Recognize).

The audible emergency indication may also be muted by a dispatcher without recognizing the emergency alarm (Mute Tones at a Single Op). This can be used in a situation where one agency is monitoring a channel that belongs to another agency. That channel can be configured to not generate audible and/or visual emergency indications.

Ending an Emergency Call

When an emergency is over, the dispatcher can end the Emergency Alarm. The visual indication on the dispatch position GUI is removed, and the console informs the other dispatch positions that the emergency is over (Emergency End/ Knockdown). The emergency mode remains active on the initiating radio unit until it is ended (reset) by the radio user.

Radio Patch Control

The dispatcher can patch communication between trunked and/or conventional radios that are normally unable to communicate with each other due to different features, programming, or even different frequency bands. A patch group is a group of linked resources that can both receive messages from a console and transmit to all other members of the patch group.

Setting up a Standard Patch

Patches are supported between trunked resources and/or conventional resources. After the patch is created, the dispatch position transmits all audio on one resource to all other resources in the patch group. In a patch between trunked resources, patched radio users with displays see

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the ID or alias of the other patched radio(s), as opposed to that of the console. This minimizes confusion and the need for the dispatcher to intervene in the call. Patches are automatically reestablished, if interrupted, so the dispatcher can concentrate on continuing operations.

Predefined Patches

Patches can be predefined and automatically reinitiated each time a dispatch position computer is restarted (Patch Auto-Start).

Call Management and Control

The dispatcher can use the following functionality to manage and control audio for different types of calls between the dispatch position and radio users or other dispatchers.

Automatic Prioritization of Calls

Calls on the dispatch position are prioritized through a transmission hierarchy. Calls from primary supervisors take priority over those from secondary supervisors, which in turn take priority over non-supervisors. Instant Transmit or All-Points Bulletin (APB) transmissions, regardless of whether they are from a supervisor, take priority over general or patch transmissions.

Multiple dispatchers can be designated as primary supervisors on the same system, which is useful when multiple agencies share one system. With the Network Manager Client installed, supervisors can disable and enable dispatch console functionality as needed.

Manual Prioritization of Calls

System Access Priority Select allows a dispatcher to prioritize trunked resources on the system as either normal or tactical. A dispatcher can change the priority of a trunked resource to tactical to give the resource a better chance of gaining communication access on a busy system. Only emergency calls have a higher priority than tactical.

When the System Access Priority Select status of a resource is changed, it is updated at all dispatch consoles in the systems that are monitoring that trunked resource.

Using the Multi-Select Feature

The Multi-Select feature allows a dispatch position to define groups of selected radio resources. When a Multi-Select group is opened, all of the resources in the group are simultaneously selected. Resources can be added or removed from a Multi-Select group while the group is open. The dispatcher can transmit on several resources simultaneously or can listen to multiple resources simultaneously in their headset or select speakers.

Standard Call Indications

The dispatch position indicates the availability of any given resource, regardless of whether the resource is involved in a transmission. An inbound call indication provides the dispatcher with a visual cue of audio activity on a radio resource and allows a dispatcher to see at a glance what the status of a resource is at any moment.

Call Alerting

A dispatcher can use Call Alert to page an unattended radio or dispatch position through a series of beeps and an indication of the sender’s ID. When available, the radio user or

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dispatcher sees the unit ID of the calling dispatch console or radio ID and is able to return the call.

Additionally, a Call Alert can trigger an activity when the receiving subscriber unit is appropriately configured. For instance, a Call Alert may cause a vehicle's horn to sound and its lights to flash. The dispatcher can even send a Call Alert to a user who is involved in voice and data communications over the network.

Enhanced Integrated Instant Recall Recorder (IRR)

The Enhanced IRR is seamlessly integrated with the dispatch position's software, allowing audio and call data from any radio or telephony resource to be recorded and easily played back. Call data includes PTT IDs, name of resource, start time and date, and stop time and date. Two analog inputs are available for use with recording audio from external devices.

1.1.7.3 Audio Logging Subsystem

The proposed console system will be integrated to the proposed logging recorder to enable the recording and replay of audio and other information associated with real-time conversations over the network. These capabilities provide the City's personnel with clear audio and enough information to easily understand the context and content of any recorded transmission.

Motorola's proposal includes an Eventide logging system for deployment at 1515 West Cypress Creek Road.

The recording capacity of the logging system will accommodate the maximum number of concurrent talk paths that can be carried on the simulcast system, mutual aid channels and an allowance for conventional stations that the City may already own or acquire in the future and wish to connect to CCGW ports.

Our tally of known talk paths that may need IP logging is shown below.

Table: Tally of Known Talk Paths

System	RF Channels	Maximum Talk Paths for Logging
10-channel Simulcast system (if all channels licensed for TDMA)	10	18
Mutual Aid channels	5	5
Reserved for other CCGW-connected conventional stations	17	17
TOTAL CONCURRENT TALK PATHS		**40**

In addition to recording audio, the ASTRO 25 system has the ability to feed the following information to the logging recorders, if supported:

- Talk group and channel information.
- User identification, such as unit ID and alias.
- Call type, such as Talk group Call, Telephone Patch Call, and Emergency Call.
- Non-voice events, such as Call Alerts, Radio Status Check, and Radio Message.

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Upon playback, this information can be displayed and searched to retrieve a desired call. The logging recorder's capacity is based on the number of radio transmissions it needs to record simultaneously, not on the number of channels that it can record.

We have proposed an Eventide NexLog740DX recording solution that meets or exceeds the specifications listed in the RFP. The NexLog740DX recorder will come equipped with the capabilities to record the following recording inputs: 24 analog channels and 48 IP channels for IP phones, and an interface to Motorola AIS which accommodates the ability to record up to 256 talk groups per AIS. It is configured to record screens on 15 PCs and is licensed for performing quality assurance reviews on up to 20 agents.

The NexLog740DX recorder servers are capable of expansion to 500 channels with the means of recording a variety of inputs (Analog, Digital, T1/PRI, and VoIP/RoIP) all within the same recording server. The NexLog740DX recorder server will come equipped with 2TB RAID1 drives, dual hot swappable power supplies, hot swappable fan assemblies, a DVD RAM drive, and multiple network ports. The NexLog740DX recording solution will have licensing for Motorola ASTRO P25 integration (audio and metadata), NG911 SIPCREC license, Callworks metadata capture to include audio, metadata, and SMS, and 16 concurrent playback software licenses.

The City can use its existing workstations for playback.



Figure: NexLog740DX Typical Playback Screen Display

Archiving Interface Server (AIS) – Primary Dispatch Only – 1300 West Broward Blvd

Archiving Interface Servers are an essential part of a logging system, and form the part of the logging solution that is handled by Motorola as opposed to the logging system vendor. The radio system audio will be captured using Motorola's Archiving Interface Server (AIS) and then sent to the proposed IP Radio Logging Recorder.

The AIS delivers unencrypted audio to the recorder.

A shared, slide-out KVM will be furnished to save rack space while providing monitor, mouse and keyboard capabilities for the AIS.

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The Archiving Interface Server (AIS) provides an interface between the radio system and the logging recorder solution. This allows calls on the radio system to be recorded together with information associated with the calls. Certain non-voice radio system events (e.g., emergency alarms, changing tactical/normal selection on a talkgroup, changing frequencies on multi-frequency conventional stations, etc.) can also be recorded.

The user can configure the recorder to monitor and record a set of radio system resources (trunked or IP conventional). The AIS monitors user configured resources, passes call-control information to the logging subsystem, and redirects audio for those monitored channels to the logging subsystem via the Radio Network Infrastructure and Control Room Customer Enterprise Network. The logging recorder then records this information to its storage media.

The following types of radio system calls are capable of being processed via the AIS:

- Trunking Talkgroup Call (secure and clear).
- Trunking Announcement Group Call (secure and clear).
- Trunking Emergency Call (secure and clear).
- Analog Conventional PTT Call.
- ASTRO 25 Conventional PTT Call (secure and clear).
- ASTRO 25 Conventional Emergency Call (secure and clear).

The following types of trunking radio system events are capable of being processed via the AIS:

- Emergency Alarm.
- Emergency Acknowledge.
- Emergency Knockdown.
- Repeater On/Off.
- System Access Priority Selection (Tactical/Normal).
- Call Alert.

Along with the type of call or event, the AIS also processes the following information associated with the call or event.

- Date and time.
- PTT ID and Alias of the initiator of the call or event.
- Talkgroup ID and Alias for trunked calls.
- Conventional Channel Alias for conventional calls.
- Site ID where the call or event entered the infrastructure.
- Zone ID where the call or event entered the infrastructure.

Recording and Replay of Archived Calls

The Eventide logging recorder proposed for the City of Fort Lauderdale is an IP-based recorder that can record all IP traffic sent to it, with additional analog recording capability as specified above. This provides the City of Fort Lauderdale with the capability to record audio at the same level of quality as that heard at the dispatch position. In addition, it can record information associated with the call beyond just the audio.

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A replay station can access recordings, including those capturing audio and metadata from 911 call takers, for example. This provides the user with a complete view of everything being recorded from a single point.

1.1.7.4 Protecting Consoles and Communications

The console enables end-to-end encryption from the dispatcher through the ASTRO® 25 network and all the way out to the subscriber, so that the City's communications will not be undermined by unencrypted transmissions. Each dispatcher is able to fully participate in secure communications while being confident that sensitive, vital information is not heard by unauthorized individuals.

Secure Access to the Console

To use the dispatch position, a dispatcher must enter a valid radio system user account name and password. The dispatch position validates that information with the radio system's network manager and allows the dispatcher to access only the resources for which the user has access rights. This also applies to third-party applications that use the dispatch console's API.

Secure Communications at the Console

The console encrypts and decrypts radio voice messages. Thus, radio voice messages are encrypted from end-to-end between the radio user and the dispatch position. The dispatcher can choose whether to encrypt their transmissions on a particular trunked resource. Dispatchers can interface with agencies that have different encryption configurations without any manual intervention or delay.

The AXS Console supports multiple encryption algorithms (AES, DES-OFB, and/or ADP) and multiple secure keys.

The dispatchers may talk and listen on radio resources which have different encryption algorithms without any manual intervention or delay.

The key material for performing audio encryption and decryption is stored locally on the console. This key material is also associated with a Common Key Reference (CKR), so that the appropriate key can be selected for a given talk group or a special call type.

Key Management via Key Variable Loader (KVL)

Key management via a key variable loader (KVL) feature provides the ability to manage all the keys for an AXS Console or archiving interface server using only a KVL. Our proposal includes one (1) KVL 5000 model of our Key Variable Loader.

1.1.7.5 Incorporating Console Configuration and Management

The proposed console system is configured and managed by the same configuration manager, fault manager, and performance reporting applications as the radio system. The user can define exactly which resources are available and how they are presented to the dispatcher. This provides the City of Fort Lauderdale with a single point for configuring and managing the entire ASTRO 25 system. Changes are automatically distributed throughout the system.

This centralized approach saves valuable time and effort for system administrators and technicians and reduces the errors that can occur when radio IDs and other data are entered at

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multiple locations. In addition, call traffic and performance reports for each dispatch position can be generated from the system's network manager, enabling administrators to quickly and easily ensure optimal effectiveness and efficiency.

1.1.7.6 Interfacing with Third-Party Applications

Third-party applications will potentially have the ability to interface with the AXS Dispatch Console through Application Programming Interfaces (APIs). These APIs provide third party application vendors with access to the same features and functionality as the dispatchers. A Software Developer Kit (SDK) and appropriate licenses are required to access and use the APIs by application vendors other than Motorola. The third-party vendors are responsible for participating in this program at their expense, to develop the necessary integrations with the AXS Dispatch Console API. Various forms of integration are also available via other components of the ASTRO 25 system, such as via ATIA, or optional CADI or PM interfaces.

1.1.7.7 Dispatch Console Solution Components

The proposed components are connected together and to the rest of the ASTRO® 25 system on an IP network through console site routers and switches. The console functions as an integrated component of the total radio system and fully participates in system-level features, such as end-to-end encryption.

The console connects directly to the radio system's IP transport network. Audio processing, FIPS 140-3 compliant hardware-based encryption, and switching intelligence for dispatch are performed within each dispatch position.

Since the network is IP-based, the system interfaces and components can be distributed physically throughout the network. Some of the available console components are identified below.

CommandCentral AXS Dispatch Console Operator Position

The dispatch position supports multiple peripheral accessories, including a USB microphone, headsets, and a footswitch. The following list describes the components included in the proposed configuration.

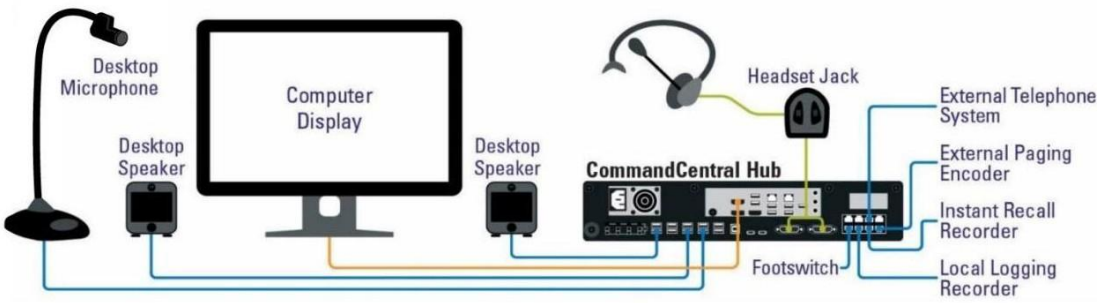


Figure: CommandCentral AXS Dispatch Console Accessories Example

Computer Display

A 24" touch screen monitor has been proposed for each console position.

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CommandCentral Hub (CC Hub)

The *CommandCentral* Hub (CC Hub) is the platform on which the *CommandCentral AXS* Dispatch Console operates. The CC Hub contains a number of analog inputs and outputs for connecting various peripheral devices as well as a workstation class computer motherboard.

The PC that is internal to the CC Hub will be programmed with a Microsoft Windows based operating system (OS) image developed for the dispatch application.

Desktop Speakers

Two (2) USB purpose-designed audio speakers have been included in the proposal per dispatch position and can be configured to transmit audio from a specific talk group or set of talk groups. Each speaker is a self-contained unit, with individual volume control, and can be placed on a desktop or mounted on a rack or computer display.

Headset Jack

The dispatch position supports up to two headset jacks, both push-to-talk (PTT) and non-PTT-enabled, for simultaneous use by the dispatcher and a supervisor. The headset jack contains two volume controls for the separate adjustment of received radio and telephone audio. Two (2) headset jack-boxes have been included in the proposal per dispatch position.

Headset

Per the RFP, the City wishes to furnish its own Poly CA22CD-SC wireless headsets. Therefore, no headsets are included in our proposal. The base unit of the Poly CA22CD-SC can plug directly into the proposed headset jack boxes.

Gooseneck USB Microphone

The microphone controls the dispatch position's general transmit and monitor features through two buttons on its base. The microphone can be fastened down or left loose. It can be used alone or in conjunction with a headset.

Footswitch

Each dispatch position includes a dual pedal footswitch that controls general transmit and monitor functions.

Telephone/Headset Interface Port

The telephone/headset port provides a connection for an external telephone to the dispatch position. This allows the operator to use a single headset to communicate on both the radio system and an external telephone system.

External Paging Encoder Port

The external paging encoder port provides a connection for an optional external tone paging encoder to provide tone paging services via the dispatch console. Analog paging tones generated by the encoder are transmitted by the dispatch console on the selected trunked and/or conventional radio resource(s).

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Local Logging Recorder Port

As an alternative or supplemental approach to the proposed IP-based audio logging system, the analog output port on the *CommandCentral* Hub allows an analog port of the proposed logging recorder, or any analog logging recorder situated in the same facility, to be connected to a dispatch console if desired. Long-term audio recording is used to record a portion of the inbound and outbound audio present on a specific dispatch position. These recordings are typically archived for long-term storage, and provide a historical record of the radio communications made at a given dispatch position.

The analog output port can be configured to log any combination of these audio sources, such as:

- Audio received from a currently selected radio.
- Microphone audio being transmitted by this dispatcher to the currently selected or unselected radio resources.
- Any tones generated by the dispatch position that appear in its speakers (trunking tones, emergency tones, etc.) or tones generated by an external paging encoder.

Private Aux I/O Port

The dispatch console supports four (4) Private Aux I/O relays located on the *CommandCentral* Hub of the dispatch position. Each relay can be configured to support any one of the five functions or it can be configured to be unused.

- Call on Selected Channel.
- Operator PTT.
- Emergency Beacon.
- Activate Private Relay when Public Aux I/O is Active.
- Select Phone Off Hook Relay.

Redundant Ethernet Connection

The proposed redundant Ethernet connections increase console availability by protecting against the loss of multiple dispatch positions. In the event of a LAN switch failure, the system will automatically detect and switchover with no manual intervention required. Dispatching operations will not be interrupted.

1.1.7.8 The City of Fort Lauderdale's Proposed Console Configuration

Number of Dispatch Consoles and Locations

The *CommandCentral AXS* dispatch console consists of the *CommandCentral* Hub running on a Windows Operating System, while the GUI is displayed on the Edge web browser. The proposed solution provides the City of Fort Lauderdale with the following dispatch consoles at the indicated locations:

Table: Number of Dispatch Consoles and Locations

Location Name	Number of Dispatch Consoles
1300 West Broward Blvd	6

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Location Name	Number of Dispatch Consoles
2200 Executive Airport Way	8

Dispatch Console Hardware

The *CommandCentral AXS* dispatch console solution can be enhanced through dispatch peripherals, such as speakers, microphone, headset jack, and footswitch. These peripherals are designed for 24/7 usage without degradation in performance or reliability.

The *CommandCentral AXS* dispatch console features the following hardware elements:

- *CommandCentral* Hub with inbuilt hardware encryption module.
- Monitor – 24” touch-screen enabled.
- Two (2) Speakers.
- Microphone.
- Headset jack box.
- Footswitch.

Further accessory specifications are available at Motorola’s website.

Numbers and Types of Radio Resources

The proposed CommandCentral AXS dispatch console solution for the City of Fort Lauderdale makes the following radio resources available to dispatchers.

Table: Numbers and Types of Radio Resources

Type of Radio Resource	Quantity
Trunked or conventional	Up to 160 per console

Locations of Conventional Interfaces

The proposed *CommandCentral AXS* solution for the City of Fort Lauderdale provides the following conventional channel interfaces at the indicated locations. At the dispatch sites, ports will be used by the proposed backup control stations. At the State of Florida site, 5 ports will be used by the proposed Mutual Aid channels. Residual ports will be available to the City for other purposes.

Table: Locations of Conventional Interfaces

Location Name	Conventional Channel
State of Florida tower shelter	Up to 8
Utilities tower shelter	Up to 8
Playa del Sol equipment room	Up to 8
Point of Americas equipment room	Up to 8
1300 West Broward Blvd dispatch site	Up to 8
2200 Executive Airport Way dispatch site	Up to 8

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Number of Aux I/O Servers and Locations

The proposed console supports Global Auxiliary Inputs/Outputs (Aux I/Os) for remote status indications or remote control through dispatch consoles. Global Aux I/Os are typically implemented by hardware that is independent of the dispatch console in a system and may be accessible to multiple dispatch consoles. Aux I/O Servers provide the Aux I/O feature for the consoles. The proposed *CommandCentral AXS* solution provides the following Aux I/O servers at the indicated locations.

Table: Number of Aux I/O Servers and Locations

Location Name	Number of Aux I/O Servers
1300 West Broward Blvd dispatch site	1
2200 Executive Airport Way dispatch site	1

Number of Logging Solutions and Locations

The proposed *CommandCentral AXS* solution provides an AIS interface to the proposed logging solutions at the indicated location.

Table: Number of Logging Solutions and Locations

Location Name	Number of Logging Solutions
1300 West Broward Blvd dispatch site	1

Backup Control Stations – APX Consolette

Motorola has included APX Consolette control stations at the Dispatch Sites, configured as follows per the City's requirements:

- Six (6) 700/800 MHz APX Consolettes (one per dispatch position) at 1300 West Broward Blvd dispatch site.
- Eight (8) 700/800 MHz APX Consolettes (one per dispatch position) at 2200 Executive Airport Way dispatch site.

At both locations, an 8-port Control Station Combiner has been included in our proposal, along with a pair of coaxial lines and 3 dBd gain control station antennas per location, intended for roof mounting. The proposal was prepared with the assumption of coaxial cable runs not exceeding 300ft at 1300 West Broward Blvd and 200ft at 2200 Executive Airport Way.

The APX Consolette provides a low-cost, mid-power wireless dispatch solution as an ideal complement to a modern P25 dispatch center. Equipped with leading edge P25 technology, the APX Consolette can be used as an emergency backup station when infrastructure is offline, or for wireless access to different system types for increased interoperability between agencies.



Figure: APX Consolette

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The APX Consolette's P25 operation and compatibility with legacy systems ensures that communications are clear, continuous, and coordinated across multiple users, agencies, and systems. The durable robust metal housing provides durability and allows for easy servicing, while the integrated front panel numeric keypad allows fast access to radio controls.

The APX *All-Band* Consolette delivers the convenience of three radios in one while maintaining APCO TIA receiver specifications. With the APX All-Band, personnel can use one (1) consolette to communicate and provide dispatch operations across multiple digital and analog networks that operate in any three (3) of the following frequency bands: 700 MHz, 800 MHz, VHF, and UHF (R1/R2). Generally, consolettes that are to be connected to a control station combiner should be configured for single-band use only, as these combiners are band-specific. For this reason, APX Consolettes included with this proposal will be equipped for 700/800MHz use only. Should the City have needs in other bands, we will be happy to quote the all-band configuration, or models equipped for specific other bands.

To preserve desk space, we propose that consolettes will be rack-mounted in the rooftop equipment room at 1300 W Broward Blvd and in the back office equipment room at 2200 Executive Airport Way, and at both locations will be accessible to the dispatchers as console resources via a CCGW. Additionally, the dispatch locations will each be equipped with a Conventional Site Controller that allows console access to the consolettes even if the dispatch site becomes isolated from the Zone Core for any reason. Motorola has assumed that all APX Consolettes will be installed into the equipment racks included with this proposal.

Some customers prefer to use a local logging recorder (analog track recorder) to log audio from control stations. Since the proposed control stations are intended to be connected to CCGW's, during normal operations they will be accessible at the Archiving Interface Server and can be centrally logged by the proposed IP logging recorder.

Distributed Equipment Configuration for the 1300 West Broward Blvd Site

The 1300 West Broward Blvd site was not able to be visited during site walks due to ongoing construction at the site. Motorola understands there will be two equipment rooms made available at this facility: one on the roof, and another internal to the building near to the dispatch area. The City has advised (during the Pre-proposal Conference) that dark fiber from preinstalled fiber cables will be made available by the City, between these two equipment rooms. Motorola's proposed site configuration will require the use of 4 pairs of dark fiber from the aforementioned cables.

For this site we propose a Four-LAN-Switch Dispatch Site configuration, with equipment being distributed between the two equipment rooms in a way that will not require any additional cabling between the two rooms (other than the aforementioned fiber cables). This will allow two LAN switches to be situated in the rooftop equipment room, and two LAN switches to be situated in the interior equipment room. The LAN switches will each be equipped with fiber SFP modules to terminate and "light up" the fiber pairs made available by the City. The Four-LAN-Switch architecture is an ASTRO site configuration that has been adopted and approved by Motorola for situations just like this.

We propose that the rooftop equipment room will house the indoor Nokia microwave equipment, MPLS Router, two Site Routers, LAN Switches #1 and #2, (6) backup control stations, control station combiner, Conventional Channel Gateway, AUX I/O shelf, and Conventional Site Controller. The interior equipment room (i.e. the "back office" to the dispatch area) will house

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LAN Switches #3 and #4, the Archiving Interface Server, Control Room Firewall, and Eventide Logger.

1.1.8 Microwave and MPLS Transport Network

Motorola Solutions is proposing a Nokia backhaul solution developed by our long-time partner, Infinity Technology Solutions. The primary purpose of a public safety network today is to carry emergency Land Mobile Radio (LMR) P25 traffic. The communications network must always provide services that can be shared among agencies, expandable into new areas, and easily managed from end to end. The emergence of new applications and the growing need for resiliency and interoperability between agencies are important reasons for change. Better communications and interoperability are now possible with the introduction of IP communication. TDM technology is limited in efficient bandwidth usage when handling IP-based traffic which is bursty and dynamic in nature. With local government's growing need to allow more centralized high impact applications on their networks, many agencies are modernizing their communications infrastructures by upgrading legacy LMR and microwave networks from TDM-based to full IP-based networks. Our proposed microwave solution will equip the City of Fort Lauderdale with an IP-based microwave infrastructure that is equipped for today's and tomorrow's transport needs.

Unlike other microwave suppliers, Nokia's Wavence platform is not a hybrid solution but a true all packet-based architecture ensuring a lower total cost of ownership with the features required to support the new IP-based era, all while providing a redundant architecture to ensure the highest availability for the City's First Responders.

1.1.8.1 Microwave Network Design

This project will provide an all new microwave backhaul network for Fort Lauderdale. The project includes six hot stand by microwave paths in a ring configuration. All paths are designed with monitored hot-standby (MHSB) microwave radios. All paths are designed with the Nokia Wavence UBT-I all indoor radio. The Nokia 7705 Service Aggregation Router (SAR-8) will provide microwave awareness (MWA) for the Wavence microwave transceivers, as well as provide MPLS fast re-route for sub 50ms ring switching. Four (4) of the microwave paths are designed in the L6 GHz band, and two (2) of the paths are designed in the 11 GHz band. All of the microwave paths are designed with adaptive modulation with a maximum modulation of 128 QAM and a data throughput of 161 Mbps. All ring paths are designed to provide a minimum 2-way availability of 99.999%.

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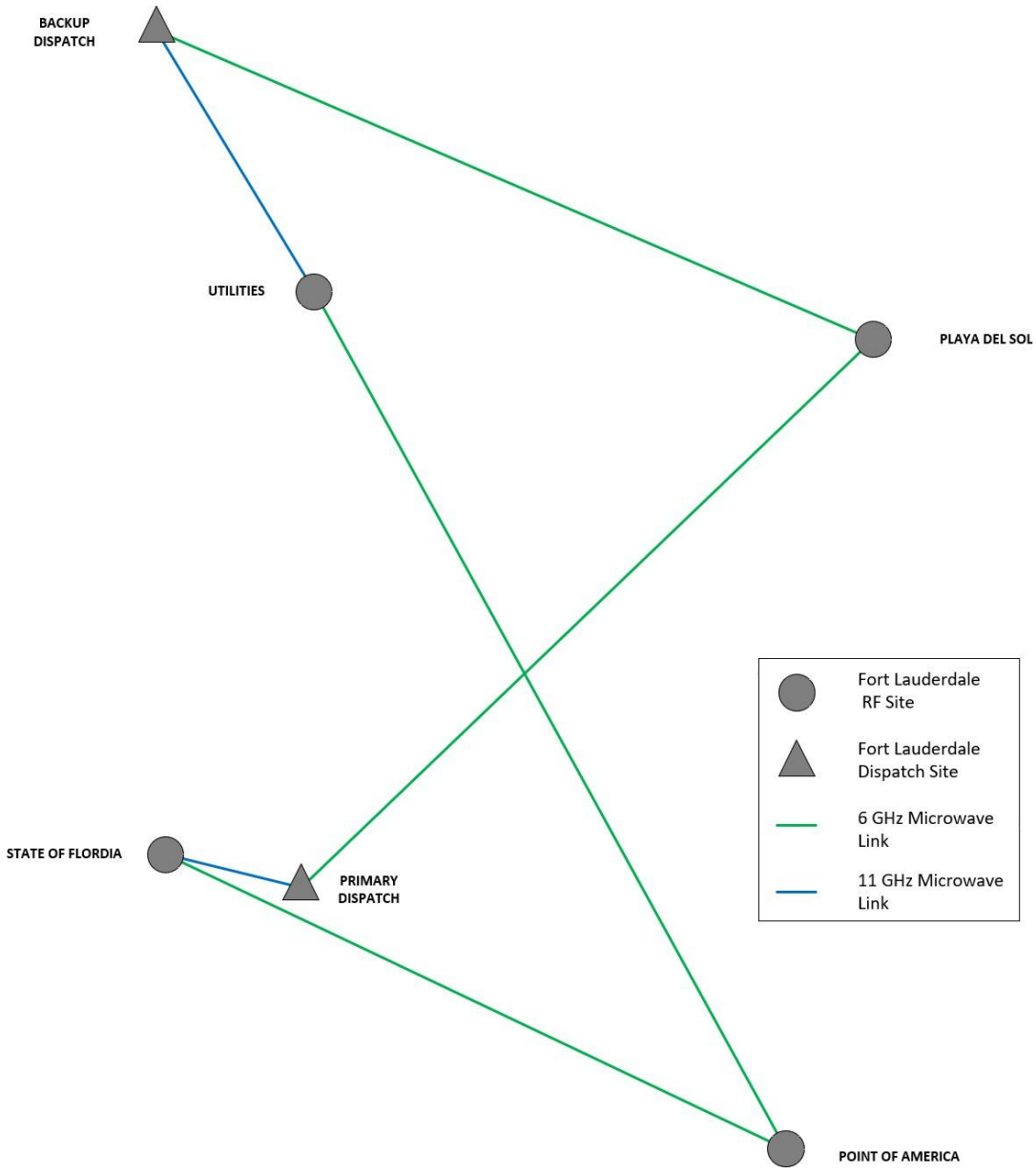


Figure: Proposed Microwave Backhaul Topology

1.1.8.2 Path Details

Preliminary Path Loss and Fade Margin Calculations are provided as part of the documentation for this proposal. The path calculations are based on the data provided and radio guaranteed specifications. It is assumed that sufficient clearance is available on all paths.

Each path is designed for a specific predicted average annual path availability, which is based on the predicted annual percentage of time the path is available, i.e. receiver signal level

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exceeding the receiver threshold at a BER of better than or equal to 1E-6, excluding interference, in both directions (two-way) and expressed as a percentage (i.e. 99.999%).

Paths have been designed to and equipment selected with the following criteria:

- Fading Algorithm: Vigants-Barnett
- Rain Model: Crane 2003
- Availability requirement: two-way 99.999%.
- Terrain Data USGS NED 10m elevation
- Clutter Data USGS 2019 NLCD 30m
- 20’ tree growth
- Path Clearance:
- 100% F1 @ K = 1.330
- Grazing F1 @ K = 0.400

The following table shows the radio hops for the 4 site design, including site names, antenna coupling unit (ACU) configuration, capacity, and radio type:

Table: Microwave Path Details

Path	Site Name	ACU	Frequency (MHz)	Radio Model	Output PWR (dBm)	Capacity (Mbps)	Fade Margin (dB)	Annual Two-Way Availability (%)
1	Point of Americas Utilities	MHSB	6100	Wavence UBT-I	31.00	161	41.70	99.9998
2	Utilities 2200 Executive Way Backup Dispatch	MHSB	11200	Wavence UBT-I	32.50	161	41.01	99.9999
3	2200 Executive Way Backup Dispatch Playa Del Sol	MHSB	6100	Wavence UBT-I	28.00	161	41.96	99.9999
4	Plays Del Sol 1300 W. Broward Primary Dispatch	MHSB	6100	Wavence UBT-I	30.00	161	41.87	99.9999
5	1300 W. Broward Primary Dispatch State of Florida	MHSB	11200	Wavence UBT-I	25.00	161	41.44	99.9999
6	State of Florida Point of Americas	MHSB	6100	Wavence UBT-I	28.50	161	41.99	99.9999

In full compliance to the RFP, Motorola has included the Backup Dispatch Site in the proposed microwave ring, facilitated by a proposed 80 ft monopole tower to be erected at the 2200 Executive Airport Way facility. The monopole is necessary to achieve sufficient line-of-sight clearance for RFP-compliant, high-availability microwave paths. The highest dish would have a 65 ft center in the proposed design, so an 80 ft monopole gives a small buffer in case of a dish height increase of a few feet during final, field path survey. Due to its close proximity to the airport, any antenna structure being considered at this location will require an FCC filing and will

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trigger an aeronautical hazard study by the FAA. It is Motorola's opinion that anything approaching an 80 ft monopole has a low likelihood of gaining FAA approval, judging from the minimal heights observed for nearby existing structures.

To cover the possibility that the FAA may not approve the proposed monopole structure at the height required to support the microwave dishes at 2200 Executive Airport Way, Motorola has priced a contingency option for a redundant ASTRO Connectivity Services (ACS) connectivity to this dispatch location, which can be found in our price proposal. If deployed as an alternative to the proposed microwave links, ACS provides primary connectivity via fiber infrastructure, with backup LTE modem connectivity. Motorola Solutions is able to offer the ACS service as a licensed Competitive Local Exchange Carrier (CLEC). The optional ACS circuits will provide connectivity to both the Zone Core at the State of Florida tower site, and to the Backup Zone Core (DSR) at the Utilities tower site.

The 1300 West Broward Blvd PDHQ building could not be site walked due to ongoing construction. Preliminary studies indicate this location requires a 70 ft dish height for the path toward Playa del Sol to clear building obstacles sufficiently. Blueprint drawings provided with Addendum #3 along with Google Earth elevation readings of the roof height, appear to show that the antenna frame structure planned for the rooftop will reach about 68 ft above ground level. Motorola intends to affix a steel pole to the antenna frame structure to achieve a few extra feet of height to mount this microwave dish and thus accomplish a 70 ft centerline. Alternatively, the steel pole could be mounted to the wall of the rooftop equipment room, based on the City's preference. Either way, the mount design would, of course, undergo an appropriate structural analysis.

The path studies completed during the design phase of this project were calculated using the best tools and environmental data available. However, these path studies are limited by being only a mathematical prediction based on specific assumptions and cannot account for every environmental anomaly that may affect microwave path performance, such as unexpected tree growth and unaccounted terrain formations. To ensure the reliability of these proposed microwave links, a field path study will be performed following Contract Award. The microwave design is not finalized until these field path studies are completed, and the results of the field studies may necessitate additional microwave equipment, such as longer cable runs, or in rare cases the need for a more substantial design modification.

The following considerations and assumptions are incorporated into the path calculations:

- All the calculations are generic in nature and cannot be used for final engineering purposes. An actual field path survey must be conducted to verify the following:
  - Geographical coordinates and site elevations, building obstructions, path clearances, etc.
  - Tower heights, and the placement of various types of antennas, lights, guys, etc. Antenna heights used in the study are preliminary and should not be relied upon for final engineering design.
  - Cable line lengths.
  - Factors which may affect the design of the microwave system.
- Should an actual field path survey reveal an obstruction to a clear path for the microwave signal, Motorola will provide documentation detailing the obstructions and work with the City on a design modification.

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Path profiles are provided in Attachment 22 – 3.12.2.2.A Path Profile Analysis.

1.1.8.3 Wavence UBT-I

The proposed Wavence UBT-I solution will omit the standard microwave service switch (MSS), reducing initial cost at every microwave site, also reducing additional points of network failure, rack space, parts sparing, maintenance contract software pricing, and site power consumption

UBT-I is installed in a 2.5 RU shelf, which supports up to two units of any frequency band or RF configuration. The same shelf can support 1+0, 1+1, 2+0, or even a single shelf repeater of 1+0 radios. The filters and branching are customized to determine the actual configuration. In addition, multiple shelves can be installed in the same rack, with multiple RF channels stacked on the same filter branching structure.

The UBT-I provides excellent radio capabilities in all bands (5,8/6L/6U/7/8/11 GHz).



Figure: Wavence UBT-I Microwave Radio

1.1.8.4 Antenna System

Microwave antennas form an essential part of modern mobile communication networks. A new CommScope antenna system is proposed at each site. The 6 GHz microwave radio links will utilize 6ft. VHLP6-6W dishes. The 11 GHz microwave radio links will utilize 3ft. VHLP3-11W dishes. All proposed antennas are single polarized and adhere to the FCC Part 101 Category A performance specification. All antennas proposed are equipped with radomes.

Table: Microwave Antenna System

Path	Site Name	Main Antenna Model	Main Antenna Height (ft)	Main TX Line	Main TX Line Length (ft)
1	Point of Americas	VHLP6-6W	110	EW63	140
	Utilities	VHLP6-6W	240	EW63	100
2	Utilities	VHLP3-11W	180	EW90	210
	2200 Executive Way Backup Dispatch	VHLP3-11W	50	EW90	80

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3	2200 Executive Way Backup Dispatch	VHLP6-6W	65	EW63	95
	Playa Del Sol	VHLP6-6W	280	EW63	100
4	Playa Del Sol	VHLP6-6W	280	EW63	100
	1300 W. Broward Primary Dispatch	VHLP6-6W	70	EW63	50
5	1300 W. Broward Primary Dispatch	VHLP3-11W	60	EW90	50
	State of Florida	VHLP3-11W	145	EW90	175
6	State of Florida	VHLP6-6W	130	EW63	160
	Point of Americas	VHLP6-6W	240	EW63	100

The antenna types, sizes, centerlines and transmission line lengths are preliminary, subject to the path/site survey verification and frequency coordination / FCC licensing results.

1.1.8.5 MPLS Overview

Nokia 7705 Service Aggregation Router Augmentation

Each physical site in the proposed ASTRO 25 network is proposed to be equipped with a Nokia 7705 SAR-8 Service Aggregation Router (MPLS router). The State of Florida tower location will be equipped with a second SAR-8 under this proposal to afford a superlative level of MPLS resiliency for the Zone Core and main Prime Site.

Table: Locations and Proposed Quantities of SAR-8 MPLS Routers

Location Name	SAR-8 Quantity
State of Florida tower shelter	2
Utilities tower shelter	1
Playa del Sol equipment room	1
Point of Americas equipment room	1
1300 W. Broward Blvd Primary Dispatch Site	1
2200 Executive Airport Way dispatch site	1

Nokia 7705 Service Aggregation Router Product Overview

The Nokia 7705 Service Aggregation Router (SAR) is an edge aggregation platform providing superior IP/MPLS and pseudo-wire capabilities. It addresses the need for a cost-effective, scalable transport solution. The 7705 SAR excels at concentrating traffic at hub sites, and adapting it to a normalized IP/MPLS infrastructure leveraging available media, especially scalable, cost-effective Ethernet. The 7705 SAR's quality of service, traffic management, provisioning and troubleshooting features make it possible for the City of Fort Lauderdale to enjoy a consistent, reliable transport capability. Its flexible, future-proof architecture will enable the City of Fort Lauderdale to address any future aggregation requirements.

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The inclusion of the 7705 SAR in the City of Fort Lauderdale design brings the following benefits:

- Provides network reconvergence in tens of milliseconds using a strong suite of dynamic routing and recovery capabilities.
- Supports multiple services over a wide range of transport media including microwave, optical, copper and others.
- One-for-one hitless control and switch module failover.

The main components of the 7705 SAR are the chassis, Control and Switching Module (CSM), fan module, and adapter cards. The 7705 SAR shelf mounts in a 19-inch equipment rack. The 7705 SAR is powered by -48 VDC with dual power feeds. The 7705 SAR will include redundant CSM controller cards and redundant -48VDC power feeds. All the 7705 I/O cards and fan module are hot swappable. The 7705 Service Aggregation Router optionally supports DS1, DS3, OC3, GE, 10 GE, xDSL, GPON and CWDM/DWDM interfaces.

7705 SAR-8 Shelf

The SAR-8 Chassis is compact with modular flexibility. The top slots are reserved for redundant switch fabric and control processor modules (SF/CPM). The remaining 6 slots are used for a wide variety of Media Dependent Adapters (MDA) to interface and groom user traffic. The 7705 SAR-8 operates on - 48 VDC and supports a dual feed input power.



Figure: Nokia SAR-8 MPLS Router

7705 SAR-8 Control and Switching Module

The Control and Switching Module (CSMv2) has three main functions, it provides the management and console interfaces to the 7705 SAR-8, synchronization interfaces for external synchronization input and output signals and control of the routing, switching, and services functions for the entire system.

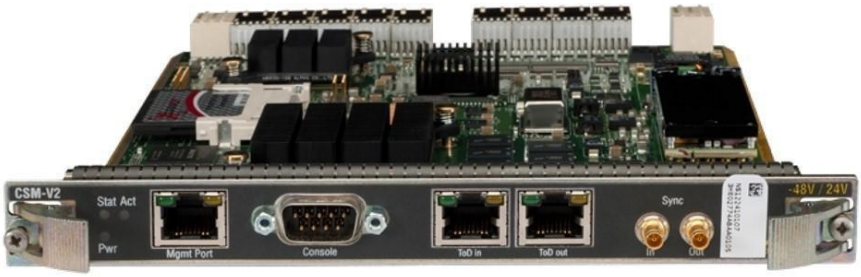


Figure: SAR-8 Control and Switching Module

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7705 SAR-8 Packet Microwave Card

The 7705 Packet Microwave Card (PMC) has two (2) RJ-45 ports (ports 1 and 2) and six (6) SFP ports (ports 3 through 8). All ports provide10/100/1000 Mb/s. Ports 1 through 8 all support Ethernet/IP/MPLS networking. All Gigabit Ethernet ports provide the same networking feature capability as the 8-port Gigabit Ethernet Adapter card. Each port has an associated LED that displays its activity and link status; additionally, the faceplate has separate LEDs to display the card's power and operational status.

The Motorola Solutions/Nokia MPLS Solution: Capabilities & Benefits of MPLS on a Microwave Network

Today, many state and local government agencies have recognized the need for networks with more capacity and flexibility, which typically means a packet network. However, not all IP-based solutions are appropriate. Traditional IP and Ethernet networks lack the ability to optimize the use of network resources and the capability to react to network events fast enough to guarantee end-to-end QoS per application. To simultaneously support all mission-critical and non-mission-critical traffic, an IP/MPLS-based communications network is needed to support traffic that requires QoS levels beyond best effort.

By using MPLS, the City's network will get the best of both worlds — an IP network that has the robustness and predictability of a circuit-based network along with high capacity and support for bursty traffic. The Nokia IP/MPLS product we propose for the City of Fort Lauderdale leads the industry in reliability, thus meeting the "always-on" requirement for mission-critical operations.

Future Proofing and Expansion

If new links need to be added to the system at a future time, the network doesn't need to be redesigned. The new links can be integrated and used without impacting operations.

Quality of Service

In most microwave systems, there are only 4-7 levels of priority, versus sixty-four (64) potential levels in a MPLS network. This is critical when the backhaul is used to transport multiple services of varying importance on the network and gives more granular control and priority to those services.

The Service Router Operating System (SR OS) software provides superior quality of service (QoS) on the 7705 SAR. The same level of deep buffering and support for ingress and egress shaping that is available on Nokia's edge and core routing platforms is also available on the 7705 SAR aggregation platform. Consistency of traffic engineering and shaping across the network provides higher packet routing performance overall with differentiated service treatment. This facilitates the prioritization of traffic for mission-critical network operators. SR OS software allows for advanced service offerings, and delivers efficient network resource usage.

Services Based versus Layer 2 Switching or Layer 3 Routing

In Layer 2 microwave, all traffic is switched through the network. VLANS cannot be overlapped or reused for various applications or customer traffic. The same applies for Layer 3 routing networks on a microwave system. MPLS brings in the terminology of services. Traffic on a MPLS network can be any type of traffic, whether Layer 2 or 3. Services are isolated between customer applications and networks. Essentially this allows for overlapping networks while

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being able to share a single common carrier media. Services are broken up into three main types. There are many more service types but the primary services are listed below.

- Virtual Private Wire Services (VPWS), which emulates a wire across a large geographic area.
- Virtual Private LAN Switching (VPLS), which allows for what appears as a traditional switching environment, but maintains separate Forwarding databases based on the service it belongs to.
- Virtual Private Routed Network (VPRN), which appear to the user as a router. The benefit is each routed instance is virtual and Layer 3 routed environments can be duplicated across a network and are isolated to a unique Virtual Routing and Forwarding (VRF) instance.

Layer 2 Microwave Alone versus Layer 2 Microwave with MPLS

The potential for an equipment failure or human error can cause a network broadcast storm in a Layer 2 network without MPLS. Essentially these failures will not only affect the device that the source of the problem is connected to, but the entire Layer 2 network. With MPLS, these network failures cannot occur or bring down critical network infrastructure network traffic. The Microwave links are configured as Point-to-Point links and the MPLS gear is placed between the ASTRO 25 infrastructure equipment and the microwave transceivers. The MPLS network blocks unwanted loops on any one link and provides the network with ring protection.

MPLS Ring Protection

The integrated network offers the necessary reliability to maintain uninterrupted operation for both voice and data traffic. A single failure on the network ring in any part of the network will not impact the network capabilities. By finding alternative routes quickly around the failure, the end users will not be affected or aware that a ring switch has occurred.

The use of IP/MPLS as a packet transport infrastructure provides rapid, deterministic failure accommodation in the network. Traffic engineering tools can be used offline to model single failures and ensure they can be accommodated. When one of the links fails, MPLS protection can switch the traffic to the other working link at speeds comparable to SONET architectures after detecting the link failure.

Traffic Prioritization

Another key benefit of MPLS is Traffic Prioritization. As discussed above, in a reroute scenario, the high priority MPLS connections will take precedence over lower priority traffic insuring mission critical traffic reaches its destination.

If the traffic load were to exceed the capacity of the remaining links during a link failure, advanced traffic management mechanisms will ensure the protection of the higher priority traffic, with best-effort data being transmitted according to available excess bandwidth. It is important to note that the City's ASTRO 25 traffic alone will never be enough (under the proposed design) to present this situation.

However, traffic prioritization also provides benefits during normal operations. The network operator will be able to define which traffic type or agency's traffic has priority. During periods of high traffic demand, important traffic will be guaranteed to reach its destination according to defined requirements. A range of prioritization classifications is available. MPLS allows convergence over a common transport layer and dynamic bandwidth allocation, enabling low

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cost backhaul. Critical, time sensitive traffic (such as Land Mobile Radio) can be prioritized in an IP/MPLS tunnel in order to ensure it will reach its destination almost as if it was “wired” to the base station directly. Each service can have a specific bandwidth assignment for necessary or committed rate and/or a peak information rate to burst up to as additional bandwidth comes available when other applications have finished communicating.

Network Traffic Shaping

Ports and devices can be assigned a restricted amount of bandwidth throughout the network, which in combination with QOS prevents low priority traffic from congesting any link on the network. Congestion is blocked at the input to the network based on assigned QOS profile.

It should be stressed that the proposed microwave solution has significantly more throughput capacity than required by the ASTRO 25 system, even in a link failure-and-reroute scenario. This means that congestion is never likely to occur unless the City were to introduce other (non-LMR) traffic to the transport system, but these capabilities will be available to the City nonetheless.

1.1.9 Capacity and Grade of Service

1.1.9.1 Number of Channels and Talkpaths

The following capacity requirements were provided in the RFP and in traffic logs provided by the City, and were used to help define the voice traffic profile:

- **RFP Section 3.3.3:**
- System Planning and Capacity
- **RFP Appendix B**
- Existing Channel Structure – Frequencies and Talk Groups
- **Single-day System Traffic Logs**
- Reflecting system usage on April 5, 2025

In addition to the single day’s system usage data provided in the traffic logs furnished by the City, Motorola had access to a full month of traffic data from the City of Fort Lauderdale system that had been collected between the dates of **01/19/2024 - 02/18/2024**. Motorola used these dates due to large influx of tourists in the City of Fort Lauderdale, resulting in the highest traffic in the last twelve months.

Motorola therefore chose to **exceed the RFP’s requirements** by basing its analysis on the worst case (i.e. highest peak hour traffic) of the two datasets. The result is that **28% more baseline traffic was considered than the City-provided traffic logs** made evident.

Motorola used the above data from the City of Fort Lauderdale system to approximate the traffic load (expressed in the unit known as “erlangs,” where 1 erlang = 3,600 call-seconds) expected for a busy hour event, and to generate a baseline voice profile.

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The significance of the load experienced on the system's single day was compared to the full month of data referenced above. The peak event was actually found in the full month of data for Fort Lauderdale; in other words, the single day's load from the City-furnished logs was not as high as the peak event for the month of data that Motorola had previously captured.

A further 25% capacity growth was then added to the analysis of the peak hour between the two datasets.

When analyzing traffic needs, it is important to understand that when a channel is carrying TDMA (P25 Phase 2) traffic, a single RF channel can carry two (2) talk paths concurrently. Dynamic Channel Assignment (DCA) channels are channels that can automatically transition between FMDA or TDMA operation based on demand and upon the availability of that channel when a new call arrives. One RF channel per site is always reserved as a control channel.

Motorola is proposing a 10-channel P25 Simulcast Cell with 4 Channels Licensed for Dynamic Channel Assignment, to meet the capacity in Fort Lauderdale based on the above requirements and data analysis. This will provide a minimum of 5 up to 9 FDMA voice talk paths and a maximum of 8 down to zero TDMA voice talk paths, or various combinations thereof as listed in the table below, depending on the mix of active FDMA and TDMA talk paths on the system at any given time. This configuration EXCEEDS the County's required 1% Grade of Service performance (per RFP section 3.7.2.3).

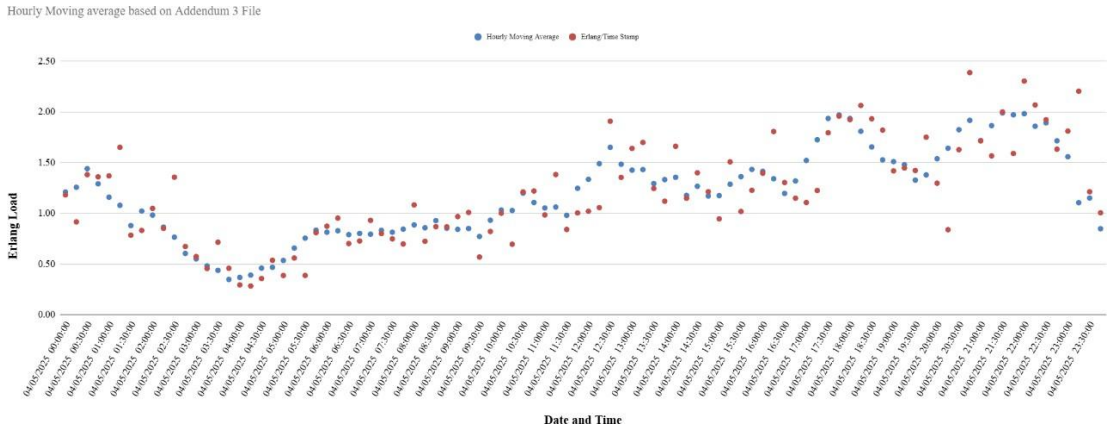
Table: Dynamically-changing resource breakout

Total RF Channels	FDMA Talk Paths	TDMA Talk Paths	Total Talk Paths
10	5	8	13
10	6	6	12
10	7	4	11
10	8	2	10
10	9	0	9

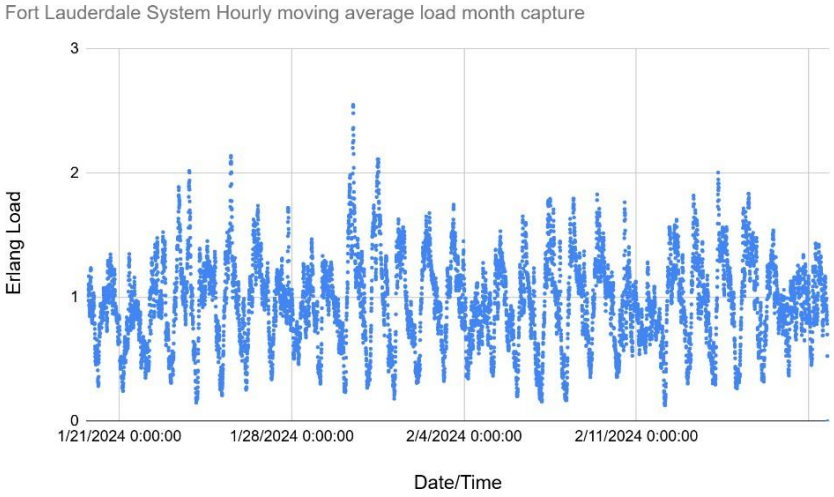
The traffic measured from the two sets of data considered in this study, is shown graphically in the two charts below.

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System Usage Chart based on the City's single-day traffic logs



Fort Lauderdale System Daily Load Chart January 20, 2024 to February 19, 2024



The first chart pegs the erlang load in 15-minute intervals, whereas the second chart pegs the erlang load in 5-minute intervals. To determine the peak busy hour traffic, it is necessary to find the four 15-minute or twelve 5-minute consecutive values that yield the highest average value, and then take that average to be the busy hour traffic load. When this is done, the peak busy hour traffic was 1.99 erlangs from the single day traffic logs, or 2.56 erlangs from the full month of data.

The simulation profile included 15 active talk groups, with varying call durations and call rates as would be seen in any real trunked system. Active subscribers are also distributed unevenly among the talk groups. These talk groups originated approximately 817 calls that were on average 11.25 seconds long, or 12.5 seconds when hang time, setup and takedown of each call is factored into talk path utilization.

Our engineering team used a design strategy to simulate required channel counts with the peak traffic load scenario seen in the captured log files and with a 1.25x multiplier to account for

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growth in load. The applied growth factor effectively scales up the modeled call count from 817 to 1,021 busy hour calls. We analyzed different scenarios, using a required talk path analysis, to determine the proper channel count to meet the City's requirements. While other channel counts were simulated to arrive at the recommended configuration, the summaries presented here consider the performance for 10 RF channels with a DCA configuration for four (4) of those channels.

The key findings are presented in the table below:

Table: Summary of peak busy hour traffic simulation scenarios

SCENARIO Definition	RF Channels	Talk Paths that are usable to the offered traffic	Simulated erlangs, (TDMA)	Simulated erlangs, (FDMA)	Simulated erlangs, Total	TDMA Grade of Service	FDMA Grade of Service	Simulated Grade of Service (%)
All offered traffic is FDMA – Busy Hour with No Growth	10	9 FDMA talk paths	NA	2.88	2.88	NA	0.00%	0.00%
All offered traffic is FDMA – Scaled Busy Hour Profile with 25% Growth	10	9 FDMA talk paths	NA	3.55	3.55	NA	0.00%	0.00%
All offered traffic is TDMA – Scaled Busy Hour Profile with 25% Growth	10	8 TDMA talk paths	3.55	NA	3.55	0.01%	NA	0.01%
Busy Hour with 25% Growth, 50% FDMA Calls and 50% TDMA Calls	10	Varies from 9 to 13, depending on the mode of the DCA channels at any instant.	1.76	1.79	3.55	0.00%	0.00%	0.00%

The first three simulations assumed all talk groups were configured as either fully TDMA or fully FDMA; this considers a worst case where only one type of channel resource is being called for, and not as many total talk paths are available as when traffic demand is mixed. TDMA and FDMA traffic was then mixed for the final simulation.

In this table:

- Row 1 baselines the busy hour performance as measured from the peak busy hour from the datasets, without any growth, and simulates how a 10 RF channel (9 FDMA talk path) system would perform under this traffic load.
- Row 2 models the impact of 25% growth on the system and the needed amount of talk paths, should the system be subjected to entirely FDMA traffic demand.
- Row 3 models the impact of 25% growth on the system and the needed amount of talk paths, should the system be subjected to entirely TDMA traffic demand.
- Row 4 shows how the scaled load is supported when 50% of the modeled traffic is assumed as TDMA and 50% is assumed as FDMA.

The proposed 10 RF Channels (1 Control Channel + 5 FDMA-only Voice Channels + 4 DDM Voice Channels) exceed the desired 1% Grade of Service performance for all of the modeled

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traffic scenarios. Grade of Service is the probability of call attempt encountering queuing for a channel to become available, and the lower this number, the better.

Motorola has optionally priced additional TDMA licenses so that the five non-dynamic channels at each site can be designated to support TDMA traffic rather than FDMA traffic, either from the outset or as TDMA usage increases in the system over time. Each of these optional licenses would add another talk path to the system, without increasing the RF channel count, up to a maximum of 18 talk paths if all traffic is TDMA.

1.1.9.2 Home and Visiting Subscribers

The proposal includes zone core licenses for 3,000 subscribers, which can be any mix of home system or visiting subscribers. Home system subscribers are those that share the same System ID and WACN as the City of Fort Lauderdale system. Visiting subscribers are those that have a different System ID and WACN than the City of Fort Lauderdale system but are granted permission to use the City of Fort Lauderdale system.

1.1.9.3 P25 Phase 2 TDMA Operation Explained

The proposed system will be software-licensed for P25 Phase 1 (FDMA) operation on all voice channels or P25 Phase 2 (TDMA) operation on four of the voice channels.

P25 Time Division Multiple Access (TDMA) will divide each channel into two (2) talk paths, leveraging 2:1 channel efficiency to double talk path capacity over Frequency Division Multiple Access (FDMA) using the same radio frequency bandwidth allocation. This enhanced capacity improves the system's Grade of Service, leading to fewer busied calls and faster callbacks during busy situations.

Included in our proposal as a companion feature to TDMA, is the Dynamic Dual Mode feature. Dynamic Dual Mode comprises the companion features Dynamic Channel Assignment (DCA) and Dynamic Talk Groups (DTG). The proposed system will be software-licensed for Dynamic Channel Assignment on four (4) voice channels per site. The remaining voice channels (that are unequipped for DCA) will be programmed to operate in FDMA-only mode, or can optionally be programmed for TDMA use either from the outset or as more users become TDMA-capable over time. The pricing options presented with this proposal show the price for incremental TDMA licenses beyond the included first 4 TDMA channels per site.

Dynamic Dual Mode can enhance the ease of use and system operation for a mixed fleet of P25 FDMA and P25 TDMA user radios. System administrators will not need to pre-assign base stations as P25 TDMA or P25 FDMA, because the system will automatically assign the appropriate station mode based on the needs of the radio user.

It is important to note that Motorola's P25 TDMA operation complements P25 FDMA operation on the ASTRO 25 platform; it does not replace it. Talk groups configured in TDMA mode will operate on the TDMA–configured channels; likewise, talk groups configured in FDMA mode will operate on the FDMA–configured channels; talk groups configured for Dynamic Talk Group can operate in either mode and will use FDMA when any subscriber in the call is only capable of FDMA operation. With TDMA operation enabled, voice-calling capacity is increased over FDMA alone, without having to abandon FDMA-only operational stations and subscribers.

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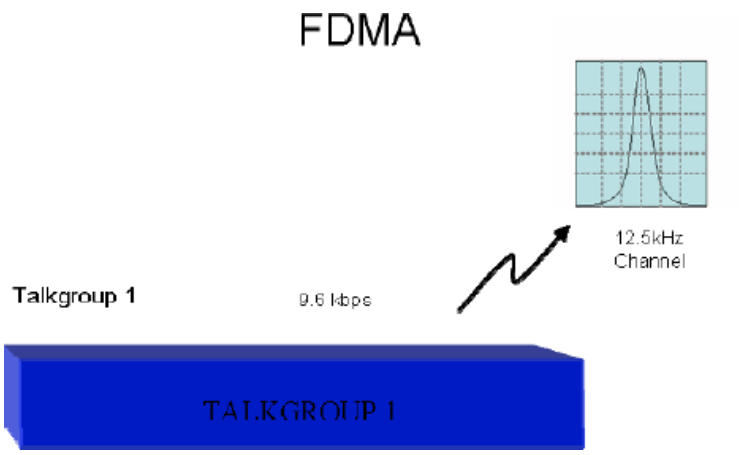


Figure: P25 Phase 1 FDMA Operation divides Spectrum into Frequency Channels, which are then assigned to Users

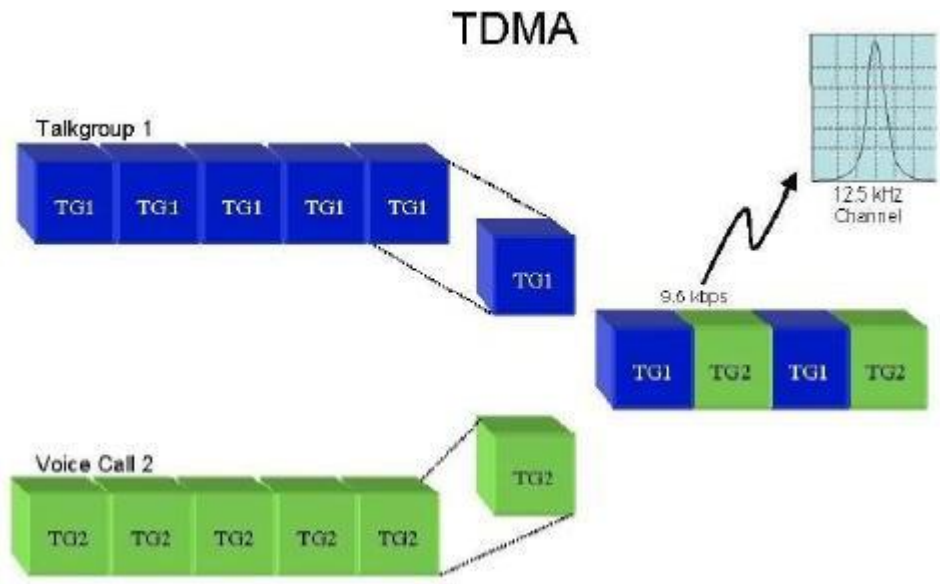


Figure: P25 Phase 2 TDMA Operation divides Spectrum into Frequency Channels then subdivides those Channels into Time Slots

P25 TDMA also provides 6.25e (6.25 “equivalent”) operation for satisfying potential future FCC spectral efficiency requirements.

1.1.10 Frequency Plan

Fort Lauderdale is fortunate to have 26 FCC licensed frequencies in the 800 MHz NPSPAC band, 14 of which were freed up by the recent decommissioning of a legacy Motorola SmartZone system, and 12 of which are in use on the current P25 system.

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This makes it possible to pick channels that have no nearby incumbents, lending strong support to the case for higher Effective Radiated Power to be employed in the coverage design through a Region 9 waiver request, than would normally be possible in the NPSPAC band.

The D Series Radio Site product allows much closer channel spacing of just 50 kHz, than was possible with traditional cavity combiners typically requiring 150 kHz to 250 kHz. Coupled with the high radio density per rack of the D Series, all ten trunked radios with the selected frequencies require only a single rack.

Motorola proposes to use the following ten channels for the trunked simulcast system:

Transmit (MHz)	Receive (MHz)	Spacing (kHz)	Used in current 12-channel P25 system
851.2125	806.2125		x
852.1875	807.1875	975	x
852.6125	807.6125	425	
852.8375	807.8375	225	
853.0375	808.0375	200	
853.0875	808.0875	50	
853.2875	808.2875	200	x
853.3375	808.3375	50	x
853.5875	808.5875	250	
853.8375	808.8375	250	

The use of only 4 channels from the current P25 system will facilitate a smooth cutover to the new system, by allowing the current system to remain in operation while the new system is being tested.

1.1.11 System Resiliency

Providing continued communications during adverse events is an essential goal of the ASTRO 25 platform. Motorola Solutions has tailored its proposed design for The City of Fort Lauderdale to maximize the system's resiliency. Many of our resiliency features have already been introduced in the preceding sections and they are summarized here, in one place, for convenient reference:

- Zone Core Resiliency
  - The Zone Core is protected by a Backup (DSR) Zone Core in a geographically separate location. Most functions – and all mission-critical functions – of the Zone Core will be available from the DSR Core in the event of Zone Core failure.
- Prime Site Resiliency
  - Geographically redundant ASTRO 25 Prime Sites are included in the proposed system to maintain wide-area simulcast communications even after the catastrophic loss of a simulcast Prime Site. If the main Prime Site becomes unavailable, the system will automatically restore wide-area operation through the secondary Prime

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Site. Prime sites gain further resiliency through redundant controllers (hosting the virtualized comparators), rubidium-oscillator backed timing sources, and battery backup power.

- RF Sub-Site Resiliency
  - RF Sub-sites are configured with high availability LAN switching to prevent the failure of a LAN switch from taking out any of the site's radio channels. Redundant Site Routers, TTA's with redundant amplifiers, N+1 radio transceivers, redundant GPS timing, industry-leading lightning protection measures, high-quality antennas, and battery backup all contribute to an impressive level of RF Sub-site resiliency.
- Transport Resiliency
  - Ring protected and monitored-hot-standby microwave with MPLS-enabled rerouting, means that all RF Sub-sites will have an alternate transport path to the Prime Sites, and Prime Sites and Dispatch Sites will have an alternate transport path to the Zone Core, even if a microwave radio or a complete link were to fail. Proposed ACS circuits for access to cloud services are backed up by LTE for resiliency.
- Dispatch Resiliency
  - The Dispatch sites will feature redundant Site Routers, consoles with dual NIC's connected to redundant LAN switches, UPS backup power at the positions, and backup control stations. A local Conventional Site Controller will maintain console access to the local control stations in the event the Zone Cores or links thereto are severed, unreachable, or unavailable.

1.1.12 Encryption

The proposed system supports end-to-end encryption using the AES encryption algorithm to ensure that only authorized radios can listen to encrypted transmissions on the network.

The Advanced Encryption Standard (AES) is an improvement over Data Encryption Standard (DES) algorithms and uses keys of 128, 192, or 256 bits to encrypt blocks of 128-bit traffic. The Motorola Solutions secure voice solution uses a 256-bit key. AES uses the Rijndael algorithm with symmetric block cipher.

The ASTRO 25 system enables end-to-end encryption from the dispatcher to the radio user, so that the City of Fort Lauderdale's communications will not be undermined by unencrypted transmissions. Each dispatcher is able to fully participate in secure communications while being confident that sensitive, vital information is not heard by unauthorized individuals.

The dispatcher can choose whether to encrypt their transmissions on a particular trunked resource. Dispatchers can interface with agencies that have different encryption configurations without any manual intervention or delay.

Not only are real-time communications encrypted, encryption extends to call logging to ensure that even recorded communications are not vulnerable to retrieval by unauthorized people. The Archiving Interface Server (AIS) can support different encryption algorithms simultaneously.

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1.1.13 System Security

In addition to the Managed Detection and Response (MDR) cybersecurity offering described in Section 1.21 of this attachment, ASTRO 25 includes a robust set of standard cybersecurity measures that will provide communications continuity and security for the City of Fort Lauderdale's system, such as:

- Centralized Authentication – Provides one control point for identification, authentication, and authorization services, using Centralized Authentication, Authorization, and Accounting (AAA) with Active Directory (AD) for all Windows, Solaris, and Linux platforms. Remote Authentication Dial-In User Service (RADIUS) extends the service to infrastructure network devices. Dual-factor authentication is employed for up to fifty (50) concurrent, remote users accessing the system via firewall-controlled IP tunnel connections.
- Secure Network Communications – Provides secure point-to-point connections between two different machines through Secure Shell (SSH).
- Secure Network Management – Secures network traffic between network managers and SNMPv3-enabled elements through the inherent authentication and encryption capabilities of SNMPv3.
- Router Access Control Lists (ACLs) – Ensure that only authorized traffic can traverse the network by filtering traffic at core, exit, gateway, and site routers.
- Ethernet Switch Port Security – Prevents unauthorized access to the system through the ports on a network switch by providing an additional layer of security at the physical location of the equipment.
- Secure Software Download (SWDL) – Ensures that transfer operations are authenticated and encrypted, based on the Secure File-Transfer Protocol (SFTP), impeding interception of transmissions by unauthorized devices.
- Automated, Scheduled Backup Procedures – Enables the quick restoration of system devices under failure conditions.
- Transparent Element Hardening – Removes nonessential tools, services, and utilities from the Windows Operating System, which could be used by an attacker to gain unauthorized access to system settings or data.
- Secure Access to the Console – To use the dispatch position, a dispatcher must enter a valid radio system user account name and password. The dispatch position validates that information with the radio system's network manager and allows the dispatcher to access only the resources for which the user has access rights. This also applies to third-party applications that use the dispatch console's API.
- Secure Access to Logging – The AIS also requires a valid radio system user account name and password be entered and validated by the radio system's network manager before it allows access to recorded information. A user can access only the recordings for which the user has access rights. This enables agencies to keep their logs private from other agencies on the same system.

1.1.14 System Voice Communications Management

The successful completion of calls is a vital factor in the ASTRO 25 radio system design. Targeted communications is important for both privacy and efficiency. Some information may be

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sensitive and intended for a specific person, while other information may be important for an entire group of radio users. Communications that are relevant for one group should not distract another group, and some radio users may need priority over other radio users when the system is busy. The proposed system for the City of Fort Lauderdale includes a collection of features to maximize communications availability, target and prioritize communications, and minimize the effort required by radio users to complete calls.

The Zone Controller manages call processing in the system. While unlikely due to redundancy, if a Zone Controller failure prevents channel requests from being acknowledged, the Automatic Retry feature will continue sending channel requests from the individual user radio until the request is acknowledged, or until a total of 16 automatic retries occur. If a radio user presses the push-to-talk (PTT) button and fails to find an open channel, Busy Queuing/Call Back will deliver a busy tone and place the call into a busy queue. As channels become available, they will be assigned to calls in the queue using pre-assigned priority levels. Radio users will be notified of the assigned channel through a callback tone.

To ensure uninterrupted communications, Recent User Priority will give priority over other radio users to radio users who have been recently assigned a voice channel. Recent User Priority will provide priority system access for up to 10 seconds between transmissions to a talk group engaged in a conversation. Misdirected Radio Protection uses embedded signaling to ensure a radio from one talk group cannot accidentally be assigned to a voice channel being used by a different talk group. If a user radio is accidentally assigned to a different talk group channel, the radio will recognize that it has been assigned incorrectly and automatically revert to the control channel. With Continuous Assignment Updating, the control channel will continue to transmit the channel assignment for as long as a talk group is using an assigned channel. This ensures a radio just coming into service will be sent to the appropriate voice channel to join the rest of its talk group. Radio Talk Group Muting will allow the radio user to mute all voice traffic for the currently selected talk group, including emergency voice received. The radio can be automatically unmuted by the dispatch operator or another radio user by sending the muted radio a Call Alert.

The proposed system provides the City of Fort Lauderdale with 10 Priority Levels, allowing system administrators to segment radio users according to their communications needs. Priority 1 is always reserved for emergencies. Priorities 2 through 10 can be assigned on a per radio or talk group basis. These priorities are only applicable when the system is busy. Priority Monitor allows the radio user to scan talk groups in their system, and mark up to two talk groups in their scan list as Priority. A non-priority conversation will be interrupted by Priority 1 or Priority 2 talk group activity.

System Wide Call simplifies the configuration and operational support to communicate critical announcements to the field. Once initiated by an authorized dispatcher, the System Wide Call is a voice group call sent to all sites and all capable APX user radios in the system. All non-emergency calls will be terminated, and radio users that are not in an emergency call will be assigned to the system wide talkgroup to receive the announcement. The user radios return to normal operation when the dispatcher ends the System Wide Call.

Dispatch operators can selectively call and carry on a Private Call with another individual radio, as long as that radio is not already engaged in another Private Call. The calling radio receives an acknowledgment of a successful Private Call. If the receiving radio has a display, it shows the calling party’s radio ID. To protect channel availability for mainstream operations, Private Call management can control how many resources are dedicated for private calls at a trunking

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RF site. The system administrator can pre-configure and limit the number of simultaneous private calls that are active at a particular site, or even disallow private calls entirely.

Dispatch operators can make a simultaneous call to multiple talkgroups, with all radios configured for talkback capability. Dispatchers can program this Multi-Group Call to operate in one of two (2) ways:

1. The requesting radio user waits for all requested talkgroups to finish all calls in progress.
2. The requested call immediately interrupts other conversations in progress without waiting for active radio users to de-key. Radio users who are transmitting on a voice channel do not hear the call until they de-key.

The proposed system provides a dispatch function called Dispatch Console/Talkgroup Merge to allow multiple talkgroups to operate together on one voice channel, improving channel efficiency.

1.1.15 System Data Communications Management

The proposed system's P25-compliant Integrated Voice and Data (IV&D) operation allows data traffic to seamlessly use the City of Fort Lauderdale's ASTRO 25 radio system. The IV&D service creates a data transport layer capable of supporting both industry-standard IP and customer-developed applications.

1.1.16 Critical Connect

1.1.16.1 Overview

Motorola Solutions' Critical Connect enables cloud-based interoperability between networks, agencies, and applications to eliminate barriers and unify communications. This real-time exchange of voice, video, messaging, and location data leads to more detailed intelligence and more informed response, regardless of device or network.

Critical Connect supports many types of communications, such as ASTRO 25 to ASTRO 25 and ASTRO 25 to carrier-integrated broadband push-to- talk, messaging, and mapping. Critical Connect's cloud-based interface connects multiple agencies and locations to provide a common operating picture.

Critical Connect adapts to agency needs and makes it easier to manage complex communication centers. Users can quickly set up and scale connections from a directory of agencies and broadband PTT carriers. These connections are easy to maintain and can grow in terms of capacity, unique connections, features, and future services. This allows the solution to evolve over time. And Critical Connect's value increases as more agencies connect. The data sharing tools and interoperability provide better collaboration. As a result, users can focus their attention and resources on important operations.

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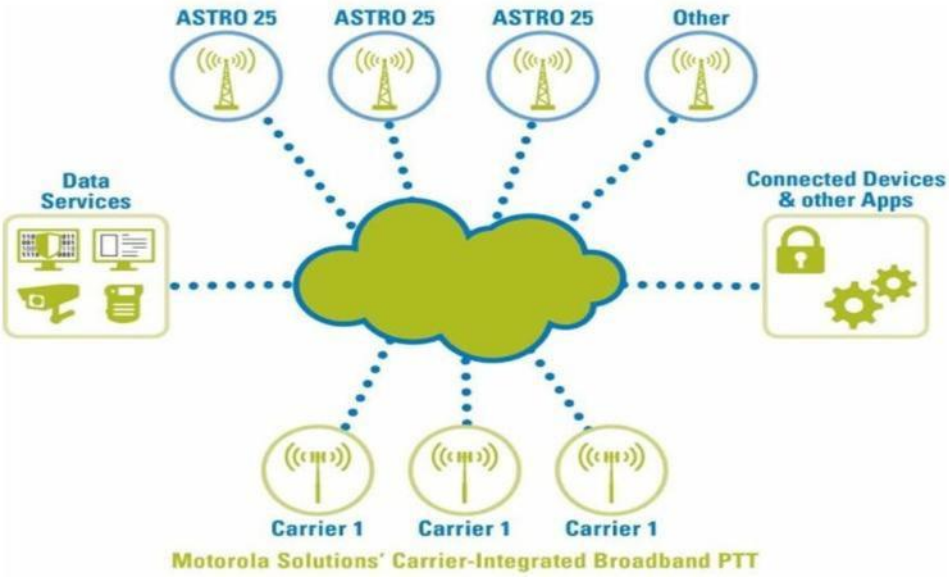


Figure: Carrier Integrated Broadband PTT

Critical Connect offers the following features to improve agency response and coordination:

- Talk Group Linking – Link local and remote talk groups to provide voice interoperability. This includes enhanced features like sharing of group IDs, user IDs, and emergency calls and alerts. Each connection supports up to eight (8) talk group links (radio local and remote talk groups, broadband PTT local, and remote talk groups).
- Manual Roaming – Enable manual roaming by linking home and foreign talk groups through the Critical Connect portal using the talk group linking feature. Home radio users must be programmed and allowed in the foreign systems.
- Automatic Roaming – Enables radio roaming into a foreign system to continue talking with its home talk group without having to change channels. Automatic Roaming is set up and configured during onboarding (users do not need to enable this feature).
- Security – Critical Connect is hosted in highly-secure, geographically separate dual cloud datacenters. All traffic leaving an agency's premises is encrypted using AES-256.
- Redundancy – Provides multiple levels of redundancy. At the cloud, we have in-data center redundancy by default, in addition to geo-redundancy if a data center is lost. On premises, optional multiple edge gateways provide redundancy for ASTRO 25 DSR configurations. Our optional pricing adds additional backhaul redundancy through the use of our ASTRO 25 connectivity service, allowing the DSR site to access the Motorola Cloud for optimal performance and reliability.

Critical Connect offers connectivity between ASTRO 25 systems, WAVE PTX, and carrier-integrated PTT or P25 systems.

Critical Connect Premium Package

We propose to the City of Fort Lauderdale our Critical Connect Premium package licensed for 13 concurrent talk paths, which is covers the maximum talk paths that the proposed trunked

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system can generate, as equipped. The Critical Connect premium package includes the following features:

- Talk Group Linking.
- P25 Manual Roaming.
- WAVE access.
- Motorola Solutions Carrier Integrated PTT Access.
- Data Access (additional hardware and implementation costs may be apply for this feature)
- RoIP Access.
- MOTOTRBO Access.
- Critical Connect Encryption.
- Enhanced Broadband Features.
- ASTRO 25 DSR or HA Redundancy.
- P25 Automatic Roaming.
- End-to-End Encryption P25 only.

Capacity:

- A subscription to support 13 concurrent ISSI talk paths has been included in this proposal. 13 talk paths is the maximum that will exist on the radio system as proposed; Critical Connect does not require a higher number of talk paths than the radio system itself can support.

1.1.16.2 Critical Connect Portal

The web-based Critical Connect portal allows users to access management tools, as well as a map of internal and external talk groups (supports talk groups such as ASTRO 25 radio and broadband). Users can remove or reject pre-approved talk groups as needed.

Through this portal, the Link Manager provides interoperability across broadband PTT talk groups and LMR talk groups. This enables secure, web-based access to the City's broadband talk groups and LMR talk groups. Users can link one or more broadband and LMR talk groups (up to eight talk groups per connection or tile). Users can share a talk group outside of their agency (external talk group) to other agencies with an "Invite-Approve-Reject" model. Users can create a talk group link across internal and external talk groups to bridge communications.

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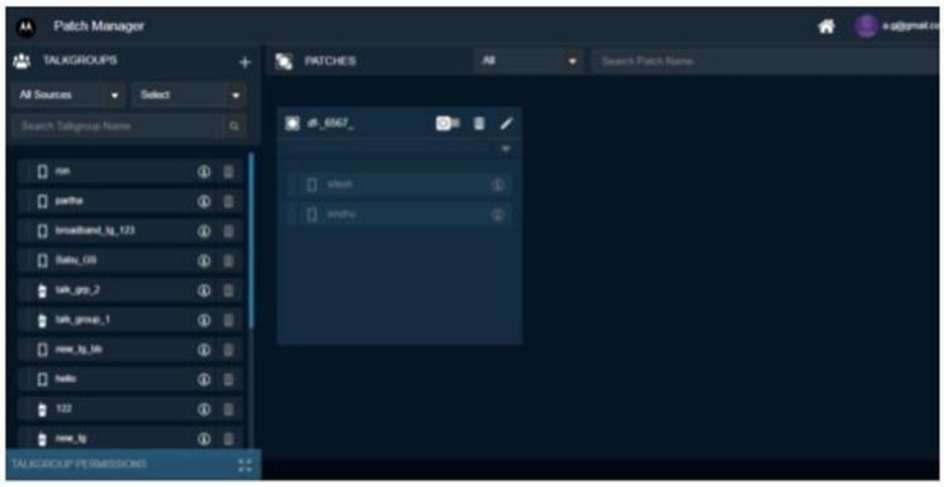


Figure: Critical Connect Patch Manager Screen

1.1.16.3 Critical Connect Interfaces

Critical Connect integrates with various interfaces to connect radio systems and broadband PTT solutions. LMR users can connect to systems across boundaries with one connection to Critical Connect.

Cloud Connectivity

Critical Connect requires connectivity from the Zone Core to Motorola's Azure Cloud data centers. Our proposal includes ASTRO Connectivity Service to create this connection, with an optional second connection from the Backup Zone Core (DSR) site. Roaming partners would be responsible for contacting Motorola to establish their own participation in the Critical Connect service, including their own connections to the Motorola Cloud.

P25 ISSI

Critical Connect uses the ISSI interface to connect ASTRO 25 systems or other P25 ISSI-compliant LMR systems. This interface enables home LMR systems to link or patch talk groups with other foreign LMR systems. It also allows radio talk groups to link with broadband PTT talk groups. Emergency Alert, Calling, and Radio Unit IDs are all transferred between compatible systems.

Critical Connect ISSI provides the following features:

- Talk group linking/patching.
- Manual Roaming.
- Automatic Roaming.
- P25 Encryption with Critical Connect AES-256 keys.
- P25 Encryption End-to-End for LMR.

Critical Connect will support up to 20 ISSI connections to other agencies when deployed with a single Inter-RF System Gateway (ISGW).

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In addition, this proposal includes software licensing for one (1) traditional ISSI 8000 port that will be able to operate as a dedicated ISSI link outside of the Critical Connect ecosystem. Backhaul/transport links to interconnect this traditional ISSI port to a partnering agency is outside the scope of this proposal. This ISSI 8000 port is earmarked for connectivity to the Broward County system.

Site Link Interface

Critical Connect offers an enhanced connection to ASTRO 25 systems for Motorola Solutions' broadband PTT radios. Using the ASTRO 25 site interface, radios can be registered as home users to provide integration between ASTRO 25 and broadband PTT users. The site interface offers scalable dynamic re-grouping (super-grouping), talk group priority controls, and private calling for home broadband PTT radios.

Site Link Interface is included in the scope of this proposal.

1.1.17 WAVE PTX Push-to-Talk (Broadband Device Enablement)

This proposal includes WAVE PTX infrastructure with licenses for 100 WAVE PTX users included at no charge. Our optional pricing shows incremental licensing for 3,000 WAVE PTX users as requested by the RFP.

1.1.17.1 Overview

Motorola Solutions' WAVE integration for Critical Connect offers a flexible, device-agnostic solution to implement carrier-independent push-to-talk (PTT) communications.

WAVE is a cloud-based solution that connects personnel across devices, networks, and locations. Users receive instant and reliable PTT features that extend communications beyond the coverage of an LMR system.

With simple installation and straightforward provisioning of new users, WAVE can scale and adapt as needs evolve. Costs are kept predictable with a low monthly subscription, offering reliable and budget- friendly unified communications.

This simplified pricing structure consists of a monthly, per-user plan with broadband and LMR interoperability.



Figure: WAVE PTX Push-to-Talk

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WAVE will enhance the City of Fort Lauderdale's Critical Connect solution with the following:

- Enables ASTRO 25-to-broadband PTT communications, leveraging the latest broadband LTE and Wi-Fi nationwide coverage to support public safety communications.
- Eliminates communication barriers between agencies by enabling virtual connections.
- Uses on-demand fleet-maps to provide flexible communications that adapt to changing needs.
- Offers inter-agency group voice communication between ASTRO 25 radios and broadband mobile devices.
- WAVE offers users the following capabilities:
  - Group Call – Talk group users (including LMR and WAVE users, WAVE-only users, and LMR-only users) can make group calls using any WAVE application. Users select the talk group, push-to-talk, and the talk group can hear the speaker's transmission and can reply. Talk groups and assigned participants are created and managed by the WAVE Central Administration tool.
  - Individual Private Call – Make private calls between two WAVE users. A user selects the person they wish to call from a contact list available within the application and can communicate with a button press.
  - Text Messaging – Send and receive group text messages with other WAVE users in a talk group.
  - Multimedia Sharing – Share images or videos from the gallery or directly from the camera. Users can share with other users or a group, and can view received videos and photos, play or save to their device. Users' history saves media to view when they log in.
  - Location – View the location of WAVE group members on a map.
  - Voice Message Pre-Recorded or Record-and-Send – Record a message that users can send to a group or to a contact. Voice messages can be played back by users at any time.
  - Persistent Threaded History on Client – View the history of text messages and PTT events for group or private calls even if they log out and log back in. Events that occur while users are logged out will be pushed down to the client so that they are caught up.
  - PTT from Lock Screen – Users can PTT from a device's lock screen without having to unlock the device or go through the application. This is exclusive to Android devices.
  - Headset Integrations – Wired or Bluetooth headsets can be used to respond hands-free in any situation.

WAVE users can engage with two (2) different interoperable clients: the WAVE Mobile Client and the optional WAVE Dispatch Client. WAVE Dispatch Clients have not been included in the scope of this proposal, but can be quoted upon request.

1.1.17.2 Mobile Application

The proposed WAVE mobile application includes the following features:

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WAVE PTX

- PTT (Private and Group Calling).
- 250 members per talk group.
- Time and distance-based Location Updates.
- Presence and Alerts.
- Priority Talk Group Scanning.
- Geo-fencing.
- Secure Messaging and Multimedia.
- Broadcast Calling.
- Quickgroups.
- Administrator and User-Managed Contacts/Groups.
- Location and Mapping Services.
- MC Streaming Video (add-on).

WAVE PTX SafeGuard

- Includes WAVE PTX features.
- Emergency Calling and Alerting.
- Multiple Users in Emergency State.
- Remote Emergency Initiation/Cancellation.
- User Check and Monitoring.
- Ambient and Discreet Listening.
- 3,000 members per talk group.
- Area-based Talk Groups.
- MC Streaming Video (optional add-on).

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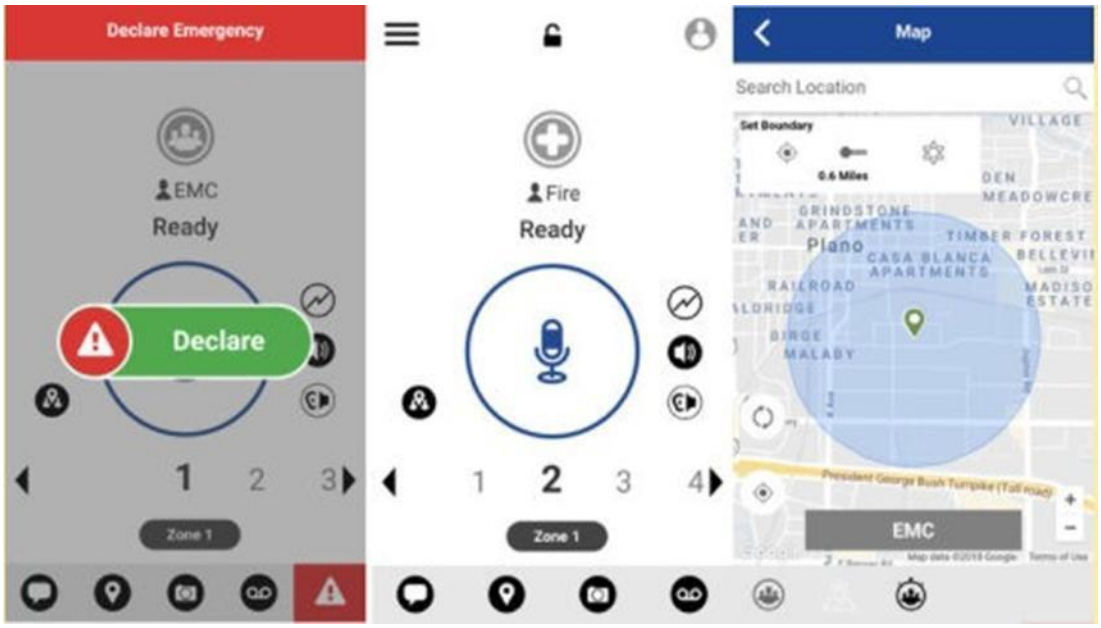


Figure: PTT Call Ready, Active Emergency, and Location Services Screens

WAVE is compatible with Android and iOS devices over 3G, 4G, LTE and Wi-Fi networks globally, providing hardware flexibility to fit different customer setups.

1.1.17.3 WAVE Administration Portal

WAVE's Central Administration Tool (CAT) helps administrators manage user contacts and talk groups. The WAVE Administration Portal allows users to manage PTT user profiles and permissions, talk groups, and external users.

- PTT Users – Manage the PTT user profile such as name, email ID, and permission type. User profiles allow for the assignment to and management of multiple users in an identical profile.
- Group Profile Management – Assign and manage talk group profiles. Talk group profiles enable the assignment of talk group attributes such as avatar, type, and Operational Status Message list.
- Talk Groups – Manage talk groups including assigning avatar, talk group scanning, supervisory override, permission to the talk group members for call initiation, and receive and in call accessibility. There are three types of talk groups that users can manage: standard, dispatch, and broadcast groups.
- External Users and Integrated Users – Manage users external to the corporation, and manage API integrations with WAVE (such as with *CommandCentral Aware*, if deployed).
- Interop Connections – Manage the connections between Critical Connect and PTT.
- User Sets – Manage the user sets of PTT Users, Talk Groups, or Integrated Users.
- OSM Configuration – Configure the Operation Status Messages assigned to users.

Certain functionality (Group Profile Management, Integrated Users, OSM Configuration) will only be displayed if the administrator has the appropriate accesses and licenses.

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1.1.18 Digital Vehicular Repeater Systems

While Motorola's proposed system is designed to tolerate a high level of building loss throughout the defined service area, there could nonetheless be situations that require something extra, such as cavernous buildings that introduce excessive loss, or marine vessels that need to be boarded by law enforcement. Many agencies use Digital Vehicular Repeater systems to bring or enhance portable radio service into coverage-challenged locations.

Motorola has included five (5) 700 MHz DVR-LX suitcase-format Digital Vehicle Repeater systems as an additional coverage support for public safety users with this proposal. (700 MHz operation was selected as DVR systems typically have to operate in an alternate band for adequate frequency separation from the P25 channels.)

The DVR-LX integrates with an APX series mobile radio to function as compact 10-Watt vehicle repeater installed in the back of a patrol car or fire apparatus. The higher power APX mobile radio extends the range of the portable radio back to dispatch.

A data sheet for the DVR-LX product has been included with our proposal.

1.1.19 Network Management

The Network Management System (NMS) can be viewed as a set of software applications or tools used to manage the ASTRO 25 wide–area trunked radio system and its constituent components.

The NMS supports the following services:

- **Network Monitoring**–Applications are included for monitoring the status of the transport network and the individual infrastructure components; displaying status information; forwarding alert information; and performing diagnostic procedures.
- **Configuration Management**–Facilities are provided for entering and maintaining the operational parameters of the infrastructure components and user devices (i.e., the mobile and portable radios).
- **Accounting Management**–NMS supports the tracking of radio usage of the system by providing an optional interface to third party accounting and/or billing applications.
- **Performance Management**–Standard and optional applications are available for monitoring, reporting, controlling, and optimizing the use of system resources.
- **Security Management**–NMS includes features for setting user privileges and controlling their access to view and/or modify information contained in the configuration databases.

The Network Management System utilizes a client–server architecture.

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1.1.19.1 Network Management Applications

In our proposal, four (4) licenses have been included for UEM, thus allowing the UEM application to run concurrently on all four NM Client terminals included in the proposal. One (1) license has been included for other capabilities described in this section.

Unified Event Manager (UEM)

The Unified Event Manager (UEM) will allow the City of Fort Lauderdale's system management personnel to manage ASTRO 25 system devices from a single screen. Historical and real time traffic screens give users access to radio events, radio status, and any device alarms. Other features include:

- Graphical views/maps.
- Active alarms and summary views.
- External notification flexibility.
- Remote site control.
- Fault reporting capabilities.
- Device inventory.
- External notification.
- Customized views.
- Role-based access.

The UEM provides a customized discovery process for optimization and deep discovery of subcomponents reported on by a device. The application also allows for automatic registration of the devices without preconfiguration. Interpreting and displaying events in an easy to understand and meaningful format—along with a topology of the network and devices tailored for the ASTRO 25 network—will ease navigation and present the network in a manner that is intuitive to a system operator.

Health of services is provided in addition to device-based alarms, including rules for determining the overall status of services in a separate view (e.g., redundant controller is down; service is still up; both views are represented). Rules have been developed for calculating alarms based on interpreting incoming events. Security procedures are in place to roll SNMPv3 keys and maintain the ability to receive SNMP inform requests through the key role of an entire network. Device commands are presented in a manner specific to each device type. During discovery, a complete device inventory with specific rules to identify service and proxied components is accomplished for all individual devices. The table below outlines features and benefits of the UEM.

Table: Features and Benefits of the UEM

Feature	Benefit
Optimized Discovery Based on System Design	UEM supports subnet discovery of the IP addresses, which are designated for radio system devices. This translates to an efficient device discovery process.

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Feature	Benefit
Discovery of Fault Managed Devices	Based on the device type the UEM has pre–determined rules for discovery of the custom entities supported on the device. Additional rules are used for event translation and alarm generation.
Fault Manager Registration	Procedures are in place to register the manager's IP address as a trap/inform destination.
Centralized View of the Communications Network	System Managers can view the ASTRO 25 system status and quickly isolate problems to the board level.
Intuitive Graphical User Interface (GUI)	System Managers are quickly notified of failures on the system and can diagnose device problems. Summary and Detail maps provide a graphical display of site status in their geographical location within the system.
Active Alarms View and Alarm Summary	Persistent single view of all failure conditions ("What's Inoperable") in the network and a quick reference summary of alarms by severity, allowing users to quickly pinpoint the highest priority failures.
Secure Device Access	SNMPv3 protocol with SHA and AES 128–bit encryption to prevent security breach attempts.
Role–Based Access Control	Assignment of user privileges for access to views and operational capabilities.
Email Notifications	User–specified event notifications are sent via secure email or forwarded to a portable mobile device, which allows System Managers to work away from the System Management Terminal but remain aware of system events.
Fault Reporting Capabilities	Event history data is auto–archived and exported for further analysis and reporting.
Remote Command Operation	Remote state change capability helps to service remote devices and avoid unnecessary trips to the sites for troubleshooting.
Network Inventory	Tabular view of the devices and their associated status.
Audit Trail and Job Status	Traceability and status for commands and actions executed.

The UEM is optimized to quickly discover the devices in the Motorola network, making installation and setup quick and error-free. The UEM has a built-in capability to identify the type of device it is discovering; it will activate the predetermined rules for discovery of the devices, which results in faster event translation and alarm generation in the manager. Each device, via its various entities (i.e., fan, power supply, etc.), will quickly inform the manager what it needs to monitor. Procedures built into the UEM will configure the IP address in the device to give the correct path for sending its information during operation.

Quick and accurate interpretation of the system activity is crucial in effective management of the devices. The UEM translates the events into intuitive information, which will inform the user of either the severity of the failure or implication of the event.

UEM translates the events into active alarms, which make the user aware which events require immediate attention versus more minor events/alarms. The alarm view dynamically updates

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based on the condition of the reported device (i.e., the alarm will be cleared from the alarm view when a device sends a clear event to the UEM)

The Reliable Communication design in the UEM provides Supervision and Synchronization services:

- **Supervision**—Provides periodic SNMP polling to ensure communication is established with each device on the network. The UEM generates communication failure alarms/events when communication between the agent and the manager fails.
- **Synchronization**—Used to ensure the accuracy of the state that the device is reporting. If the connection between the UEM and the device is lost, the device will queue up the missed fault events and re-send when the connection is reestablished. These Motorola Solutions –defined procedures were put in place to enhance the reliability of basic SNMPv3 trap messaging. These procedures manage the resynchronization of missed failures. The UEM utilizes SNMPv3 informs to enable the device to detect whether the connection has been interrupted.

UEM Enhanced Navigation

UEM Enhanced Navigation allows users to track all device and environmental information from a single user interface. The organization and accessibility of this data allows for a more intuitive end user experience.

Note: Only one Enhanced Navigation license is required per ASTRO 25 system regardless of the number of UEM licenses.

Utilizing geo-map technology, UEM Enhanced Navigation provides a high-level system view with the ability to drill down to see device–specific statuses. With the use of the MC-EDGE Remote Terminal Unit, this feature supports device metering, environmental inputs, and digital controls through a site dashboard view. Access to UEM Enhanced Navigation capabilities can be configured and secured based on defined user roles.

UEM Enhanced Navigation Tools include the following:

- Integrated Fault Management allows a single user interface to view, organize, and manage fault data.
- Interactive Maps provide a system-wide view and zone level view to highlight geographic fault status. Users can pan and zoom to adjust the area and level of focus.
- A detailed user interface provides context-based navigation, name aliasing, acknowledgment of alarms, site dashboards, and drill down to component level status.
- Environmental Alarms monitor remote inputs and provide a complete view of the site, including digital input status, analog input status and readings, and digital output control status.
- Real-time Metering allows users to view diagnostic readings remotely, assess signal strength and power, and troubleshoot issues as they are happening.
- Command and Control features allow users to remotely enable or disable channels, enable or disable access, reset devices, or key devices for testing purposes.

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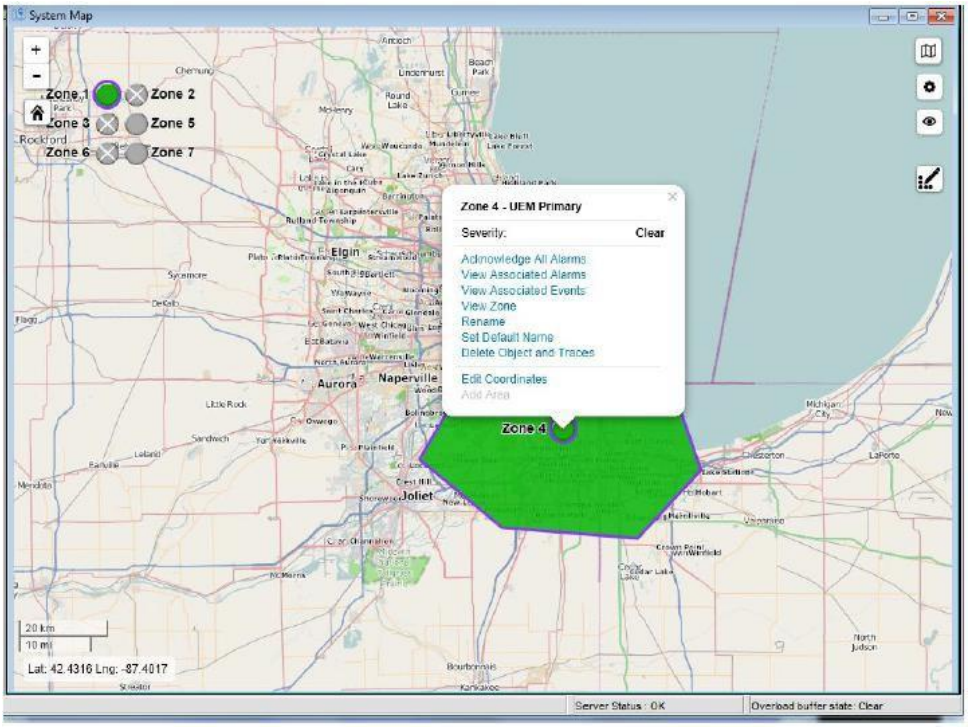


Figure: Example of a UEM Enhanced Navigation System Map

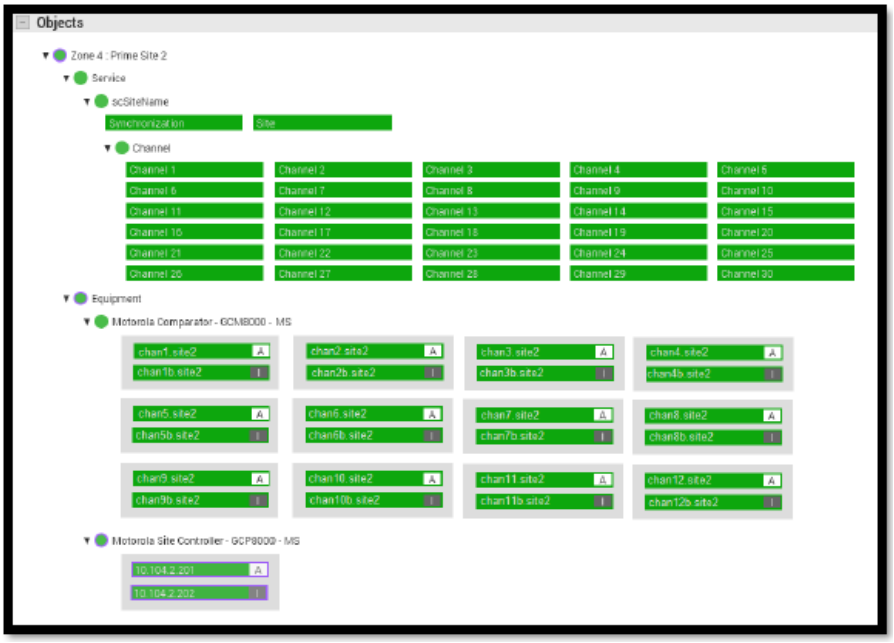


Figure: Example of UEM Enhanced Navigation "Site View" Screen

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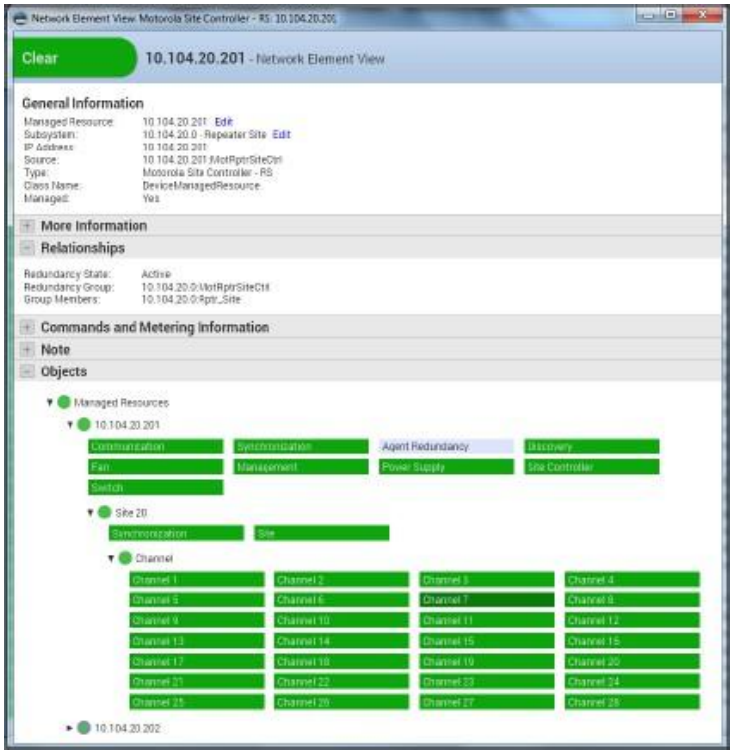


Figure: Example of UEM Enhanced Navigation "Network Element" View

ZoneWatch

ZoneWatch is a performance management tool that has customizable displays and grids to monitor real-time communications activity in the system. The information displayed can help system managers become proactive in making better resource planning decisions, such as when additional channels need to be added.

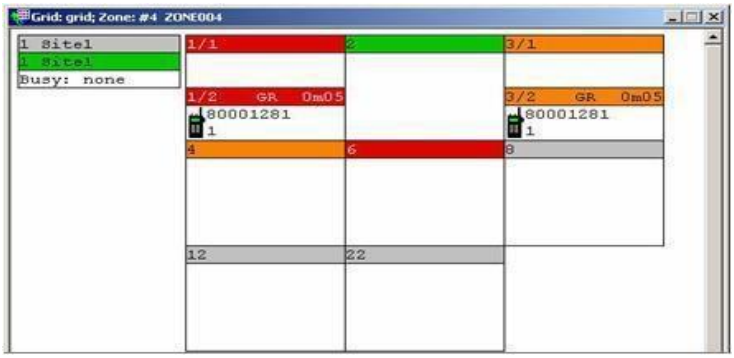


Figure: Sample ZoneWatch Screen Display

ZoneWatch also receives fault information related to repeater sites, console sites, and the zone controller from the UEM. ZoneWatch is used to monitor call traffic and allows the system manager to organize displayed information using various criteria.

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Single Site View, Channel View, and Multisite View display all important radio call information. This provides the manager with insight about radio call activity, channel usage activity, and busy activity, to more efficiently manage the radio system.

Provisioning Manager

The Provisioning Manager is a Centralized Interface for User and System Configuration and provides a friendly and intuitive graphical user interface, which allows an easy method to provision the infrastructure and devices utilized on the ASTRO 25 network.

These applications allow for configuration by authorized users, which adds a level of security. An integrated database enables users to enter data only once, helping to save time, and keeping data integrity sound by reducing errors.

- **Streamlined and intuitive web–based graphic user interface**—Utilizes less key strokes to manage critical information. Provides a central point for the configuration of operational parameters: Radio System Subscribers, Console Operator positions, and Management Users.
- **Batch creation of radios and talkgroups**—Allows for previous capability referred to as “Multi–Instance Creation”; which offers convenient mechanisms to minimize data entry and reuse configuration information.
- **Enhanced Agency Partitioning**—System managers are able to define data partitions to partition system management resources among various agencies and users.
- **Advanced Security Features**—Centralized user authentication, single sign on, and role based access controls are supported to provide enhanced Network Security to the system by enabling confidentiality, availability, and integrity of critical data.
- **Provisioning Manager Audit**—Enables stricter enforcement of system policies and provides an efficient way of troubleshooting when identifying misconfiguration issues. The administrator can navigate from an audit record to the corresponding configuration record and vice versa.
- **External Provisioning Manager Interface**—Provides a solution interface that partners with an identified third party vendor (Genesis, MCM, Premier One, NGI) which can provide an integrated solution. Offers convenient mechanism to utilize critical customer applications on the system. The capability of integrating with Asset Management is provided.
- **Radio and Radio User fields have been combined into one window**—Efficient management of subscriber provisioning by reducing the need to enter device information multiple times. Estimated time spent in maintaining subscriber configurations would be significantly reduced.
- **Import/Export Capabilities**—Offers a convenient mechanism to export and import data from external applications via .csv protocol.

Network Management Terminals

The Network Management System utilizes a client-server architecture. A typical Network Management Client (“NM Client”) includes an HP Z2 Workstation, with a 19” monitor, keyboard, and mouse.

As requested in the RFP, an NM Client has been included at each of the following locations:

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- Zone core
- Backup (DSR) zone core
- 1300 West Broward Blvd Dispatch Site
- 2200 Executive Airport Way Dispatch Site

The NM Clients at the zone core and backup core will come with 19” monitors. The NM Clients at the dispatch sites will be accessed from rack-mounted slide-out KVM monitors.

1.1.20 Spare Parts

Motorola has used its best judgment and review of recommended and available Field Replaceable Units, for the equipment scope in the proposal, to propose an included spares package for the City of Fort Lauderdale. Motorola has included a very intensive and exhaustive list of spare parts to ensure all critical failures are restored in a timely manner.

1.2 Optionally Proposed Items

This proposal includes the following options:

1. KMF
2. IMW
3. Redundancy for Critical Connect via the DSR Backup Core
4. Subscription for incremental WAVE PTX users
5. Incremental TDMA Channel Licensing
6. Cyber Security and Cirrus Central Management
7. Subscribers as listed in the price proposal

1.2.1 KMF Option

Key Management via Over-the-Ethernet Keying (OTEK) - OPTIONAL

This proposal also includes as an option, a Key Management Facility (KMF), which facilitates the use of OTEK as well as OTAR (described later in our proposal) if this option is purchased by the City. Key management through OTEK provides the ability to manage the keys for a dispatch console or AIS using only a Key Management Facility (KMF). In OTEK, the management and distribution aspects of key management are all performed by the KMF. Distribution of the key management information is performed across the radio system’s IP network from the KMF to the dispatch consoles and AIS.

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Software Developer Kit - Option

If the City of Fort Lauderdale wishes to integrate the console to any third party applications such as CAD, Motorola can license a Software Developer Kit (SDK) that contains all information necessary to enable access and use the APIs described above. The SDK's manuals document the supported dispatch APIs, including access to various dispatch features, configuration information, and aliasing information.

The SDK also includes various files needed by software developers as they create applications that use the APIs.

All SDK licensing fees and software development costs associated with third-party integration with the AXS dispatch console through APIs are the responsibility of the 3rd party developer selected by the City of Fort Lauderdale. Depending upon the vendor's implementation, additional equipment may be required such as firewalls or a dedicated console position. For more information, Motorola can provide access to an API Developer Considerations document upon request.

1.2.1.1 Key Management Facility (KMF) - OPTIONAL

The Key Management Facility (KMF) – presented as an option in our proposal – provides encryption key management services for the proposed ASTRO 25 system. Through its enablement of OTAR and OTEK to propagate encryption key updates to both subscribers and consoles, the KMF can eliminate a vast amount of manual effort that would otherwise be incurred by using a Key Variable Loader to update encryption keys one-by-one in every device that uses them.

The KMF is available in non-redundant or redundant configurations. The proposed, optional KMF has been quoted in a non-redundant configuration, recognizing that while the KMF fulfils an important and labor-saving role, a temporary KMF outage can be tolerated without impact to mission-critical operations (as encryption key changes are typically enacted relatively infrequently).

The KMF's features and services include:

- Over The Air Rekeying (OTAR).
- Over The Ethernet Keying (OTEK).
- Remote Inhibit/Enable/Zeorize.
- Automatic Retry Opportunities.
- KMF Hello.
- Store and Forward.

The KMF consists of three major elements:

- A web based software application.
- A KMF Server application.
- A KMF CryptR module for key storage.

If opted for, the KMF will be installed at the Zone Core location, in the Customer Enterprise Network.

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1.2.2 IMW Option

1.2.2.1 Outdoor Location Service

Provide Greater Accuracy and Reliability in Locating Radio Users

Motorola's optional Outdoor Location solution pinpoints the geographic location of radio users, enabling dispatch operators to deploy nearby personnel for quick response and to swiftly aid first responders who are in need of assistance.

Outdoor Location features would operate in conjunction with a mapping solution provided by the City, or this can be optionally quoted via our CommandCentral Aware offering. No mapping capability has been quoted in our proposal.

Location over Data

Location over Data allows APX radios with GPS to send location information to the system over the data channel. These updates can be cadence-based, distance-based, or manual location updates. By default, voice has priority over data; location updates are sent over the data channel when no voice call activity is present.

Intelligent Middleware

Motorola has proposed an optional redundant Intelligent Middleware (IMW) platform, primarily to support Outdoor Location and/or OTAP service, although the IMW platform is also capable of supporting other services with appropriate licensing.

Intelligent Middleware (IMW) is the Motorola Solutions software platform that provides a set of common services such as Presence and Location, and optionally Messaging, Mission Critical Geofence, and Group Management, for applications to integrate and use the information. Only Presence and Location services are involved in the Outdoor Location solution. Only Presence is required by OTAP.

Outdoor Location pinpoints the geographic location of user radios, enabling dispatch operators to deploy nearby personnel for quick response and to swiftly aid first responders who are in need of assistance.

The main components of Intelligent Middleware that may be optionally purchased by the City of Fort Lauderdale proposal are:

- The IMW high-tier, redundant server.
- Intelligent Middleware Software (SW).
- Presence and Location Licenses per 1000 users.

1.2.3 Optional Redundancy for Critical Connect via the DSR Backup Core

Motorola's price proposal includes optional pricing to add Critical Connect redundancy at the DSR Backup Core. This option, if purchased, will ensure that Critical Connect services remain

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available in the event of a Primary Core failure that causes zone core operations to transition to the DSR Backup Core site.

The option specifically adds the following items to our base proposal:

- (1) WAVE Server at the DSR Backup Core location
- (2) CRYPTR Encryption Modules at the DSR Backup Core location
- (1) LMR Multicast Proxy (LMP) application license at the DSR Backup Core location
- (1) Internetworking Firewall at the DSR Backup Core location

1.2.4 Optional Subscription for Incremental WAVE PTX Users

Motorola's price proposal includes optional pricing to add an incremental 3000 WAVE PTX Safeguard users to the WAVE PTX Broadband Device Enablement service. WAVE PTX Safeguard users are priced on an annual subscription basis.

1.2.5 Incremental TDMA Channel Licensing Option

Motorola has optionally priced additional TDMA licenses so that the five non-dynamic channels at each site can be designated to support TDMA traffic rather than FDMA traffic, either from the outset or as TDMA usage increases in the system over time. Each of these optional licenses would add another talk path to the system, without increasing the RF channel count, up to a maximum of 18 talk paths if all traffic is TDMA.

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1.2.6 Cyber Security Option

1.2.6.1 Solution Overview

Motorola Solutions, Inc. (Motorola) is pleased to present the proposed cybersecurity Managed Detection and Response (MDR) services for City of Fort Lauderdale (hereinafter referred to as "Customer") as an option in our proposal.

Identifying and mitigating cyber threats requires a reliable solution that supplies the right data to cybersecurity experts. Motorola will provide access to our ActiveEye Security Platform, along with 24x7 support from specialized security technologists, who will monitor your mission critical network against threat and intrusion.

The following ASTRO® 25 MDR features and services are included in our optional pricing for this service:

- **ActiveEye Managed Detection and Response Elements**
  - ActiveEye Security Management Platform
  - ActiveEye Remote Security Sensor (AERSS)
- **Service Modules**
  - Log Collection / Analytics
  - Network Detection
  - External Vulnerability Scanning
  - Endpoint Detection and Response
- **Security Operations Center Monitoring and Support**

1.2.6.1.1 Site Information

The following site information is included in the scope of our proposed MDR option:

Table Error! No text of specified style in document.**-1: Site Information**

Site / Location	Quantity
Core Site	1
DSR	1
Co-located CEN	2
Network Management Clients	4
Dispatch Consoles	14
AIS	1
CEN Endpoints	20

Services Included

The ActiveEye service modules included in our MDR option are shown in the tables below. The **Network Environment** column will designate the location of each module: ASTRO 25 Radio Network Infrastructure (RNI), Customer Enterprise Network (CEN), or the Control Room CEN.

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Table Error! No text of specified style in document.**-2: Service Modules**

Service Module	Features Included	Network Environment
Log Collection / Analytics	Online Storage Period: 30 Day Storage Extended Log Storage Length: 12 Months	RNI/DSR/CEN
Network Detection	Up to 1 Gbps per sensor port	RNI/DSR/CEN
External Vulnerability Scanning	Features in Section 2.4.1.4	RNI/DSR/CEN
Endpoint Detection and Response (EDR)	Online Storage Period: 30 Day Storage	RNI/DSR/CEN

1.2.6.2 Service Description

Managed Detection and Response is performed by Motorola Solutions' Security Operations Center (SOC) using the ActiveEye™ security platform. The SOC's cybersecurity analysts monitor for alerts 24x7x365. If a threat is detected, analysts will investigate and initiate an appropriate Customer engagement. Customer engagements may include, but are not limited to; deploying cybersecurity countermeasures for incident containment, requesting additional information from the Customer, continuing to monitor the event for further development, or informing the Customer to enact the Customer's documented Incident Response plan.

SOC analysts rely on monitoring elements to detect signs of a potential threat impacting the Customer's ASTRO 25 network and applicable Customer Enterprise Network (CEN) systems. These elements are described below. The MDR service includes the deployment and optimization of these elements into the Customer's network.

1.2.6.2.1 Managed Detection and Response Elements

This section and its subsections describe Managed Detection and Response elements, and their applicability for specific infrastructure.

1.2.6.2.1.1 ActiveEye Security Platform

Motorola's ActiveEye security platform collects and analyzes security event streams from the Customer's ASTRO 25 network and applicable CEN systems, using security orchestration and advanced analytics to identify the most important security events from applicable systems. The ActiveEye platform is provided in the English language.

The platform automates manual investigation tasks, verifies activity with external threat intelligence sources, and learns what events will require rapid response action.

The Customer will receive access to the ActiveEye platform as part of this service. ActiveEye will serve as a single interface to display system security information. Using ActiveEye, the Customer will be able to configure alerts and notifications, review security data, and perform security investigations.

Applies to included ASTRO 25 RNI, CEN, and Control Room CEN infrastructure.

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1.2.6.2.1.2 ActiveEye Managed Security Portal

The ActiveEye Managed Security Portal will synchronize security efforts between the Customer and Motorola. From this central point, the Customer will be able to view threat insights, event investigations, security reports, threat advisories, and status of any security cases.

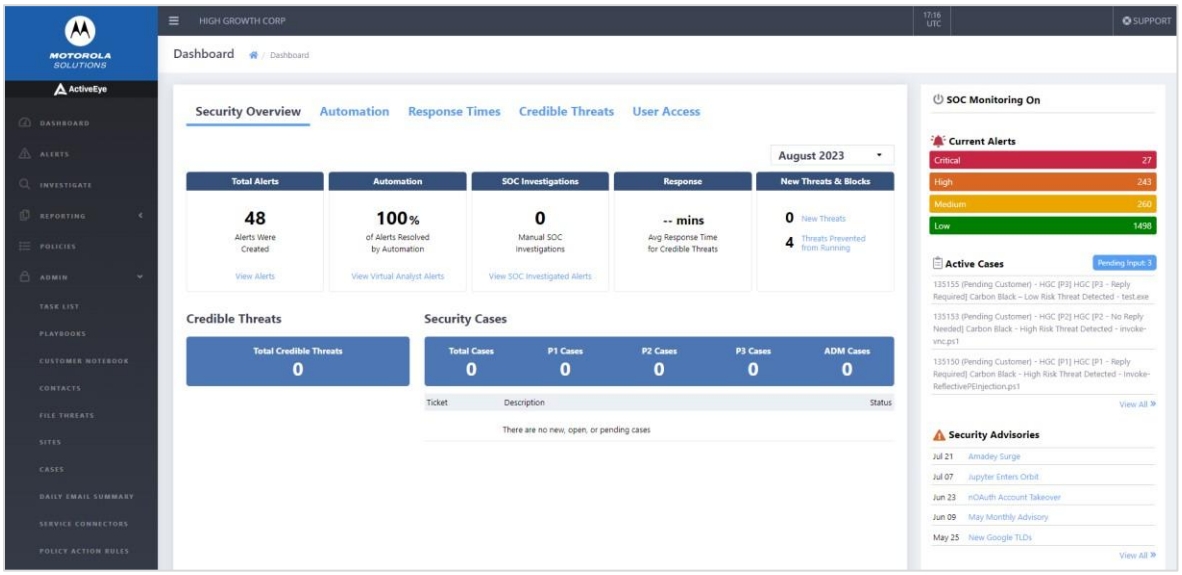


Figure Error! No text of specified style in document.**-1: ActiveEye Portal**

Dashboard

Key information in the ActiveEye Portal is summarized on the dashboard. This dashboard provides details about open alerts, an overview of alert categories, alert processing, key performance indicators (KPI), open security cases, and recent threat advisories. Also, users can access more in-depth information like security cases, alert details, alert trends, reports, and group communications.

Security Cases

When the Customer and Motorola identify a threat, the SOC will create a security case. Through the ActiveEye Portal, the Customer can view details of current or past cases.

Alert Details and Trends

Alerts can be evidence of a past, active, or developing threat. ActiveEye records relevant data for each alert, enabling users to quickly view its triggers, systems it impacts, and any actions taken to address the alert. ActiveEye Portal also provides tools for reviewing groups of alerts based on key attributes or time periods. Attribute filters enable users to toggle which alert groups ActiveEye Portal shows, helping to spot trends or threat activity. Users can also compare alert logs for specific time periods to determine if specific trends are associated with a threat or are false positives.

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Investigations and Reporting

ActiveEye Portal includes robust *ad hoc* reporting capabilities, which will provide important, additional information about active and historical threats. Users can share information outside of ActiveEye Portal by downloading reports in .csv or .json format.

In addition to *ad hoc* reporting, ActiveEye Portal can provide a daily email summary and monthly report. Daily email summaries can include alert counts, security cases opened or closed, saved queries that have new data, and detailed endpoint security statistics. If needed, ActiveEye Portal can send one or more summary emails with different content for different groups. Monthly reports are available as a PDF download.

Security Advisories

Security Advisories are messages initiated from the SOC that share information on active threats with the Customer's security teams. These advisories guide security teams on how to best take action against a threat and tell them where they can find further information.

Information Sharing

The ActiveEye Portal includes several functions for sharing information. Automatic security alerts notify pre-defined contacts of incidents, based on incident priority. Other information sharing functions include:

- **SOC Bulletins** - Instructions from the Customer, or the SOC, that SOC analysts reference when creating security cases. These can communicate short-term situations where a security case may not be needed, such as during testing or maintenance windows.
- **Customer Notebook** - The SOC will use the Customer Notebook to document the Customer's environment and any specific network implementation details that will help the SOC investigate security cases.
- **Contact Procedures** - Escalation procedures and instructions on who to contact if an incident occurs. Contact procedures include instructions and procedures for specific security incident levels. The SOC and the Customer will jointly manage contact procedures.

User Access

The ActiveEye Portal provides the ability to add, update, and remove user access. Every ActiveEye user can save queries, customize reports, and set up daily email summaries. Users may be given administrative access, allowing them to perform administrative tasks, such as setting up new service connectors, resetting passwords, and setting up multi-factor authentication for other users.

1.2.6.2.1.3 ActiveEye Remote Security Sensor

One or more AERSS will be deployed into the ASTRO 25 network and if applicable to CEN environments to deliver the service. These sensors monitor geo diverse sites for security events and pass security information to the ActiveEye platform.

AERSS integrate the ActiveEye platform with network elements, enabling it to collect logs from Syslog, as well as to analyze network traffic over monitor port(s).

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The following are the environmental requirements and specifications the Customer must provide to prepare for the AERSS deployment.

Specifications	Requirements
Rack Space	1U
Power Consumption (Max)	550 Watts (Redundant Power Supply)
Power Input	100-240V AC
Current	3.7 A – 7.4 A
Circuit Breaker	Qty. 2
Line Cord	NEMA 5-15P
Heat Dissipation (max)	2107 BTU/hr.
Internet Service Bandwidth	Bandwidth throughput 10Mbps per zone

Applies to included ASTRO 25 RNI, CEN, and Control Room CEN infrastructure.

1.2.6.2.2 Service Modules

ActiveEye delivers service capability by integrating one or more service modules. These modules provide ActiveEye analytics more information to correlate and a clearer vision of events on Customer's network. In addition, modules enable security teams and analysts to more easily access and compare data from these disparate systems. The following subsections describe each ActiveEye service module in detail.

1.2.6.2.2.1 Log Collection / Analytics

The AERSS deployed in the system collects logs and other security information from applicable servers, workstations, switches, routers, Network Detection, and firewalls. This information is forwarded to the ActiveEye platform, which uses advanced analytics to identify signs of security incidents. If it identifies signs of a security incident, ActiveEye notifies the SOC for further analysis.

Collected events will be stored in the ActiveEye Security Platform to enable historical searching or threat hunting as needed. Some high volume, repetitive logs may be aggregated as noted in the documentation. The default storage time period is one year, but no longer than 90 days, following expiration or termination of the Agreement. A longer time period can be provided if subscribed, see Table **Error! No text of specified style in document.**-2: Service Modules for subscription details.

1.2.6.2.2.2 Network Detection

The AERSS supports Network Detection, constantly monitoring traffic passing across, into, or out of infrastructure. Network Detection analyzes traffic for signs of malicious activity in real time, and performs packet level and flow level analysis to enable communications modeling. This information is used to identify anomalous behavior that is not captured by pre-defined traffic signatures, including traffic using encrypted connections. Network Detection forwards detected suspicious activity to the SOC for further analysis.

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1.2.6.2.2.3 External Vulnerability Scanning

External Vulnerability Scanning is provided for the ASTRO® internet-facing, external network interfaces. The scan is enabled from an internet cloud hosted service outside the ASTRO® network. Discovery and vulnerability scans will be run quarterly or on a less frequent schedule defined with the Customer.

1.2.6.2.2.4 Endpoint Detection and Response

Endpoint Detection and Response (EDR) is an endpoint security agent that integrates with the ActiveEye security platform to provide additional threat detection, investigation, and response actions to optimize protection of critical systems.

EDR integration with ActiveEye accelerates investigations by making necessary information available for analysts in a single platform where they can quickly access details of what caused an alert, its context, and its history.

The platform enables analysts to initiate response actions (i.e., isolate host, ban or block a file hash, terminate a process) on endpoints to respond to detection of verified malicious activity within the system. Available responses are determined by the Customer's security policies.

1.2.6.2.3 Security Operations Center Services

Motorola delivers SOC Monitoring using one or more SOC facilities. The SOC includes any centralized hardware and software used to deliver this Service and its service modules. The SOC and its centralized hardware and software are housed within an SSAE-18 compliant data center.

Motorola's SOC is staffed with security experts who will use ActiveEye Security Management Platform to monitor elements integrated by service modules. In addition, SOC staff will take advantage of their extensive experience to investigate and triage detected threats, and to recommend responses to the Customer.

1.2.6.3 Statement of Work for Cybersecurity (MDR) Option

1.2.6.3.1 Overview

Motorola Solutions, Inc. (Motorola) ASTRO® 25 Managed Detection and Response (MDR) provides monitoring of radio network security information by specialized cybersecurity analysts with extensive experience working with ASTRO 25 mission-critical networks.

The following sections describe the deliverables of the service, its technologies, and service obligations.

This Statement of Work (SOW), including all of its subsections and attachments, is an integral part of the applicable agreement (Agreement) between Motorola and the Customer.

In order to receive the services as defined within this SOW, the Customer is required to keep the system within a standard support period as described in Motorola's Software Support Policy (SwSP).

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1.2.6.3.2 Description of Service

MDR is performed by Motorola's Security Operations Center (SOC) using the ActiveEye security platform. The SOC cybersecurity analysts monitor for alerts 24/7. If a threat is detected, analysts will investigate and initiate an appropriate Customer engagement. Customer engagements may include, but are not limited to, deploying cybersecurity countermeasures for incident containment, requesting additional information from the Customer, continuing to monitor the event for further development, or informing the Customer to enact the Customer's documented Incident Response Plan.

SOC analysts rely on monitoring elements to detect signs of a potential threat impacting the Customer's ASTRO 25 network and applicable Customer Enterprise Network (CEN) systems. These elements are described below.

The MDR service includes the deployment and optimization of these elements into the Customer's network.

1.2.6.3.3 Managed Detection and Response Elements

This section and its subsections describe MDR elements, and their applicability for specific infrastructure.

1.2.6.3.3.1 ActiveEye Security Platform

Motorola's ActiveEye security platform collects and analyzes security event streams from Endpoint Detection and Response, EDR, agents and embedded ActiveEye Remote Security Sensors (AERSS) in the Customer's ASTRO 25 network and applicable CEN systems, using security orchestration and advanced analytics to identify the most important security events from applicable systems. The ActiveEye platform is provided in the English language.

The platform automates manual investigation tasks, verifies activity with external threat intelligence sources, and learns what events will require rapid response action.

The Customer will receive access to the ActiveEye platform as part of this service. ActiveEye will serve as a single interface to display system security information. Using ActiveEye, the Customer will be able to configure alerts and notifications, review security data, and perform security investigations.

Applies to included ASTRO 25 Radio Network Infrastructure (RNI), CEN, and Control Room CEN infrastructure.

1.2.6.3.3.2 ActiveEye Remote Security Sensor

One or more AERSS will be deployed into the ASTRO 25 network and if applicable to CEN environments to deliver the service. These sensors monitor geo diverse sites for security events and pass security information to the ActiveEye platform.

AERSS integrate the ActiveEye platform with network elements, enabling it to collect logs from Syslog, as well as to analyze network traffic over monitor ports and scan elements for vulnerabilities.

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The following are the environmental requirements and specifications the Customer must provide to prepare for the AERSS deployment.

Specification	Requirement
Rack Space	1U
Power Consumption (Max)	550 Watts (Redundant Power Supply
Power Input	100-240V AC
Current	3.7 A – 7.4 A
Circuit Breaker	Qty. 2
Line Cord	NEMA 5-15P
Heat Dissipation (max)	2107 BTU/hr.

Applies to included ASTRO 25 RNI, CEN, and Control Room CEN infrastructure.

1.2.6.3.4 Deployment Timeline and Milestones

The following phase descriptions lay out the necessary deployment activities and milestones required to achieve service readiness:

1.2.6.3.4.1 Phase 1: Service Onboarding

After contract signature, Motorola will schedule a service kickoff meeting with the Customer and provide information-gathering documents. This kickoff meeting is conducted remotely at the earliest, mutually available opportunity. Customer is to identify and ensure participation of key team members in kickoff and project initiation activities.

On the Kickoff Date, the Customer will be provisioned onto the ActiveEye MDR portal. The portal will enable service notifications, access to vulnerability scans and cybersecurity advisories. The first vulnerability scan will be conducted and reported within 30 days following the Kickoff Date. On the Kickoff Date, the Customer will receive instructions for accessing the Security Operations Center and Incident Response (IR) teams. Once access is provisioned, the Customer will receive any assistance required from the IR team and be able to configure key contacts for interaction with the Security Operations team. The Customer will receive instructions for accessing the Security Operations Center within the first 30 days.

1.2.6.3.4.2 Phase 2: Infrastructure Readiness

Motorola will provide detailed requirements regarding Customer infrastructure preparation actions at the kickoff meeting. It is the Customer's responsibility to accomplish all agreed upon infrastructure preparations. It is Motorola's responsibility to separately complete any obligated and/or agreed infrastructure readiness tasks.

1.2.6.3.4.3 Phase 3: System Buildout and Deployment

Motorola will build and provision tools in accordance with the requirements of this proposal and consistent with information gathered in earlier phases. Motorola will also provide detailed requirements regarding Customer deployment actions. The Customer may be required to

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deploy software and/or configurations in cases where Motorola does not manage the device and does not have access or authorization to perform the installation.

Motorola will coordinate with the customer to identify and schedule mutually agreeable maintenance windows where Motorola will perform integration of endpoint detection and response agents at in-scope sites and Customer Enterprise Networks (CENs). Endpoint detection and response agents will not be installed at sites that do not meet the minimum connectivity requirements (either site links with sufficient bandwidth or Control Room Firewalls with customer provided internet). Motorola will leave the existing antivirus solution in place on endpoints located at these out of scope sites.

1.2.6.3.4.4 Phase 4: Monitoring “Turn Up”

Motorola will verify in-scope assets are forwarding logs or events and notify the Customer of any exceptions. Motorola will begin monitoring connected in-scope sources after the initial tuning period.

1.2.6.3.4.5 Phase 5: Tuning and Customer Training

Motorola will conduct initial tuning of events and alarms in the service, and conduct an additional ActiveEye Portal training session.

1.2.6.3.4.6 Service Commencement

The Service will commence with the Service Onboarding phase or within 30 days of contract signature, whichever event occurs soonest for existing customers.

In the case of a new ASTRO system, the Service will commence in parallel to the commencement date of the core ASTRO Service package “Turn Up" go live date. Motorola and the Customer will collaborate to complete the additional deployment tasks.

1.2.6.3.5 General Responsibilities

Motorola Responsibilities

- Provide and when necessary, repair under manufacturer warranty hardware and software required to remotely monitor the ASTRO 25 network and applicable CEN systems inclusive of the AERSS and all software operating on it.
  - If the Centralized Event Logging feature is not installed on the Customer’s ASTRO 25 RNI, Motorola will install it as part of this service.
- Coordinate with the Customer on any system changes necessary to integrate the AERSS into the system and establish necessary connectivity.
- Provide software and licenses to the Customer necessary to remotely monitor the ASTRO 25 network and applicable CEN environments.
- Integrate EDR agents as per the “Deployment Timeline and Milestones” section in all network segments where endpoint detection and response is in scope.
  - Note that network segments with insufficient connectivity to support endpoint detection and response will be considered out of scope for endpoint detection and response

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  - Motorola will perform the installation of endpoint detection and response agents in the RNI-DMZ CEN(s) and Control Room CEN(s) for all Motorola managed devices that support endpoint detection and response agents.
- Assist the Customer with the installation of log forwarding agents on systems that are not managed by Motorola. Note, Motorola will perform installation on all endpoints that are managed by Motorola.
- Verify connectivity and monitoring is active prior to start of service.
- Coordinate with the Customer to maintain Motorola service authentication credentials.
- Monitor the Customer's ASTRO 25 network and applicable CEN systems 24/7 for malicious or unusual activity, using trained and accredited technicians.
- Respond to security incidents in the Customer's system in accordance with Section 2.5.6: Incident Priority Level Definitions and Response Times. Response may include, but is not limited to, requesting additional information from the Customer, continuing to monitor the event for further development or informing the Customer to enact the Customer's documented Incident Response plan.
- Assist the Customer with identifying devices that support logging within the ASTRO 25 network and applicable CEN systems have been configured to forward Syslog events to the AERSS.
- Provide the Customer with access to the ActiveEye platform enabling Customer access to security event and incident details.

Customer Responsibilities

- The ASTRO 25 MDR service requires a connection from the Customer's ASTRO 25 network and applicable CEN systems to the Internet. Establish connectivity with sufficient bandwidth before the service commences. Internet service bandwidth requirements are as follows:
  - Bandwidth throughput 10 Mbps per AERSS.
  - High availability Internet Connection (99.99% (4-9s) or higher).
  - Packet loss < 0.5%.
  - Jitter <10 ms.
  - Delay < 120 ms.
  - RJ45 Port Speed - Auto Negotiate.
  - If an ASTRO site link will be leveraged for endpoint detection and response communications, that site link must support a minimum of 2 Mbps of bandwidth.
- It is the Customer's responsibility or the contracted maintainer to install the AERSS device in the Control Room CEN.
- Allow Motorola continuous remote access to monitor the ASTRO 25 network and applicable CEN systems. This includes keeping the connection active, providing passwords, and working with Motorola to understand and maintain administration privileges.
- Maintain an active subscription for:

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  - Security Update Service (SUS) (or Remote Security Update Service), ensuring patches and antivirus definitions are applied according to the release cadence of the service.
  - ASTRO Dispatch Service and ASTRO Infrastructure Response.
- Provide continuous utility services to any equipment installed or utilized at the Customer's premises to support service delivery and remote monitoring.
- Provide Motorola with contact information necessary to complete the Customer Support Plan (CSP). Notify the Customer's Customer Support Manager (CSM) within two weeks of any contact information changes.
- Notify Motorola if any components are added to or removed from the environment as it may be necessary to update or incorporate in MDR. Changes to monitored components may result in changes to the pricing of the MDR service.
- Ensure that the ASTRO 25 system is operating on a Motorola supported release.
- Allow Motorola dispatched field service technicians physical access to monitoring hardware when required.
- Cooperate with Motorola and perform all acts that are required to enable Motorola to provide the services described in this SOW.
- Configure and maintain networking infrastructure physical and logical configuration to mirror (typically via a port(s) on a switch) network traffic to the ActiveEye sensor for applicable CEN systems.
- Responding to Cybersecurity Incident Cases created by the Motorola SOC.
- It is the Customer's responsibility to install endpoint detection and response agents in the RNI-DMZ CEN(s) and Control Room CEN(s) for any device that supports endpoint detection and response agents and is not Motorola Solutions managed.

1.2.6.3.6 Service Modules

1.2.6.3.6.1 Log Collection / Analytics

The AERSS deployed in the system collects logs and other security information from applicable servers, workstations, switches, routers, network intrusion detection sensors, and firewalls. This information is forwarded to the ActiveEye platform, which uses advanced analytics to identify signs of security incidents. If it identifies signs of a security incident, ActiveEye notifies the SOC for further analysis.

Motorola Responsibilities

- Consult with and advise the Customer on performing necessary system configurations to direct log sources to the appropriate Remote Security Sensor.
- The SOC will consult with the Customer to identify appropriate log sources.

Customer Responsibilities

- If applicable, configure customer managed networking infrastructure to allow AERSS to communicate with ActiveEye as defined.
- If applicable, configure any Customer managed devices in the CEN to forward data to ActiveEye.

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Applies to included ASTRO 25 RNI, CEN, and Control Room CEN infrastructure.

1.2.6.3.6.2 Network Detection

The AERSS deploys a Network Intrusion Detection System (NIDS), constantly monitoring traffic passing across, into, or out of the infrastructure. Network Detection analyzes traffic for signs of malicious activity in real time, and performs packet level and flow level analysis to enable communications modeling. This information is used to identify anomalous behavior that is not captured by pre-defined traffic signatures, including traffic using encrypted connections. Network Detection alerts the SOC for further analysis.

Motorola Responsibilities

- Work with the Customer to integrate AERSS.
- Optimize the policies and configuration to tune out noise and highlight potential threats.
- The SOC consults with the Customer to identify the appropriate deployment of Network Detection Service Components. The SOC monitors and updates the security policy of each sensor to tune out unnecessary alerting and flow monitoring so that the system is optimized to detect true malicious activity.

Customer Responsibilities

- If necessary, configure Customer's networking infrastructure to allow AERSS to communicate with ActiveEye as defined.
- For Customer's owned CEN infrastructure, configure and maintain networking infrastructure physical and logical configuration to mirror (typically via a port(s) on a switch) network traffic to the ActiveEye sensor.
- Initiate recommended response actions when active attacks are detected.

Applies to included ASTRO 25 RNI, CEN, and Control Room CEN infrastructure.

1.2.6.3.6.3 Endpoint Detection and Response

Endpoint detection and response agents deployed on in-scope and supported Windows and Linux hosts and servers throughout the system constantly monitor for indicators of compromise and feed this information back to the ActiveEye security platform. The Security Operations Center monitors this feed and is ready 24/7 to take action when a detection is made.

Motorola Solutions Responsibilities

- Install and/or support the installation of endpoint detection and response agents on in scope endpoints in the system as detailed in the "Deployment Timeline and Milestones" section.
- Monitor endpoint detection and response feeds for detections of indicators of compromise.
- In the event of the detection of an indicator of compromise, perform detailed investigations of the event.

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- Per the Customer's security policies and defined incident response plan, alert and engage the customer and potentially take an action to deploy a countermeasure to contain the incident.

Customer Responsibilities

- Work with Motorola to ensure that there is a documented incident response plan that indicates how Motorola should engage with the Customer in the event of a detection of an indicator of compromise.
- Provide and maintain contact information for a Customer point of contact that can take action or authorize Motorola to take action in the event of a detection of an indicator of compromise.

Applies to in scope ASTRO 25 RNI, CEN, and Control Room CEN infrastructure.

1.2.6.3.6.4 External Vulnerability Scanning

External Vulnerability Scanning is provided for the ASTRO internet-facing, external network interfaces. The scan is enabled from an internet cloud hosted service outside the ASTRO network. Discovery and vulnerability scans will be run quarterly or on a less frequent schedule defined with the Customer.

The initial scan results will be discussed with the Customer during service onboarding. Subsequent scans will be reviewed by a cybersecurity analyst. If any new findings of interest are surfaced, a ticket will be created to communicate these findings with the customer defined contacts.

Motorola Responsibilities

- Configure scans to match the Customer's preferences for external scope.
- Verify vulnerability scans are operating correctly.
- Make generated results available in the Customer's ActiveEye portal.
- Create ticket notifications for significant, new findings of interest.

Customer Responsibilities

- During Service Onboarding kickoff, provide Motorola with the IP addresses and/or domain names to be included in the external vulnerability scans.
- In accepting this Statement of Work, the Customer authorizes Motorola to engage in external vulnerability scans of internet-facing, external assets disclosed by the Customer.
- Be responsible for updating Motorola with any changes to the IP addresses and/or domain names of the internet-facing, external assets subject to the external vulnerability scans.
- If the information required to enable vulnerability scanning of the internet-facing, external assets is not provided initially or is not current at any time during the term, Motorola will suspend scans until it is reasonably satisfied that it has been provided with the most current information.
- Review all quarterly vulnerability reports, and tickets of new findings.

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- Perform any remediation actions required to address identified vulnerabilities.

Applies to Internet facing assets only.

1.2.6.3.7 Security Operations Center Monitoring and Support

1.2.6.3.7.1 Scope

Motorola delivers Security Operations Center (SOC) Monitoring using one or more SOC facilities. The SOC includes any centralized hardware and software used to deliver this Service and its service modules. The SOC and its centralized hardware and software are housed within an SSAE-18 compliant data center.

Motorola's SOC is staffed with security experts who will use ActiveEye security platform to monitor elements integrated by service modules. In addition, SOC staff will take advantage of their extensive experience to investigate and triage detected threats, and to recommend responses to the Customer. Depending on Customer security policies and the extent to which endpoint detection and response is deployed within the system, the SOC may take actions to deploy countermeasures in an attempt to contain a security incident. Customer support is provided in the English language.

Motorola will start monitoring the ASTRO 25 MDR service in accordance with Motorola processes and procedures after deployment, as described in Section 1.2 Deployment Timeline and Milestones.

The SOC receives system-generated alerts 24/7, and provides the Customer with a toll-free telephone number and email address for support requests, available 24/7. Support requests are stored in a ticketing system for accountability and reporting. The SOC will respond to detected events in accordance with Section 2.5.6: Incident Priority Level Definitions and Response Times.

1.2.6.3.8 Ongoing Security Operations Center Service Responsibilities

Motorola Responsibilities

If a probable security incident is detected, provide phone and email support to:

- Engage the Customer's defined Incident Response Process.
- Gather relevant information and attempt to determine the extent of compromise using existing monitoring capabilities in place as part of the ASTRO 25 MDR service.
- Analysis and support to help the Customer determine if the Customer's corrective actions are effective.
- Continuous monitoring, in parallel with analysis, to support Incident Response.

Customer Responsibilities

- Provide Motorola with accurate and up-to-date information, including the name, email, landline telephone numbers, and mobile telephone numbers for all designated, authorized Customer escalation Points of Contact (POC).
- Provide a timely response to SOC security incident tickets or investigation questions.

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- Notify Motorola at least twenty-four (24) hours in advance of any scheduled maintenance, network administration activity, or system administration activity that would affect Motorola's ability to perform the Managed SOC Service, as described in this SOW.

1.2.6.3.9 Technical Support

ActiveEye Security Management Technical Support provides the Customer with a toll-free telephone number and email address for ActiveEye Security Management support requests, available Monday through Friday from 8 a.m. to 7 p.m. CST.

Motorola Responsibilities

- Notify customers of any scheduled maintenance or planned outages.
- Provide technical support, security control, and service improvements related to ActiveEye.

Customer Responsibilities

- Provide sufficient information to allow Motorola technical support agents to diagnose and resolve the issue.

Limitations and Exclusions

Technical support is limited to the implementation and use of the ActiveEye platform and does not include use or implementation of third-party components.

1.2.6.3.10 Incident Response

An Indicator of Compromise (IoC) is an observable event that Motorola Security Analysts have determined will jeopardize the confidentiality, integrity, or availability of the system. Examples of IoC include ransomware or malicious use of PowerShell.

When an IoC is observed, the Motorola Security Operations team will engage with the customer to investigate the issue, determine the extent of the compromise, and contain the activity to the extent possible with the Motorola security controls deployed within the environment. This expert guidance is available upon contract signature and extends through MDR infrastructure deployment phases and the term of the contract.

When an IoC is observed by the Security Analyst, Motorola and Customer will be responsible for the tasks defined in the following subsections.

Motorola Responsibilities

- Upon the identification of an IoC, notify the Customer's documented contact and initiate the escalation plan.
- Take documented, Customer approved actions in an attempt to contain an IoC to the extent enabled via Motorola managed technology. Communicate to the Customer any additional potential containment actions and Incident Response resources that can be taken across the Customer's managed IT infrastructure.
- Perform investigation using the ActiveEye MDR integrated and enabled data sources in an initial attempt to determine the extent of an IoC.

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- Document and share IoC and artifacts discovered during investigation. Motorola services exclude performing on-site data collection or official forensic capture activities on physical devices.

Customer Responsibilities

- Maintain one named Point of Contact (PoC) to coordinate regular team discussions and organize data collection and capture across the Customer and Motorola teams.
- If determined to be required by Customer, contract an Incident Response service provider to perform procedures beyond the scope of this Agreement such as forensic data capture, additional malware removal, system recovery, ransomware payment negotiation, law enforcement engagement, insurance provider communications, identify patient zero, etc.

1.2.6.3.11 Event Response and Notification

Motorola will analyze events created and/or aggregated by the Service, assess their type, and notify the Customer in accordance with the following table.

Event Handling

Event Type	Details	Notification Requirement
False Positive or Benign	Any events determined by Motorola to not likely have a negative security impact on the organization.	None
Event of Interest (EOI)	Any events determined by Motorola to likely have a negative security impact on the organization.	Escalate to Customer in accordance with routine notification procedure. Escalate in accordance with urgent notification procedure when required by agreed-upon thresholds and SOC analysis. Notification procedures are included in Table 2-2.

1.2.6.3.12 Notification

Motorola will establish notification procedures with the Customer, generally categorized in accordance with the following table.

Notification Procedures

Notification Procedure	Details
Routine Notification Procedure	The means, addresses, format, and desired content (within the capabilities of the installed technology) for Events of Interest (EOI). These can be formatted for automated processing, e.g., by ticketing systems.
Urgent Notification Procedure	Additional, optional means and addresses for notifications of Events of Interest that require urgent notification. These usually include telephone notifications.

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Motorola will notify the Customer according to the escalation and contact procedures defined by the Customer and Motorola during the implementation process.

1.2.6.3.13 Tuning

Motorola will assess certain events to be environmental noise, potentially addressable configuration issues in the environment, or false positives. Motorola may recommend these be addressed by the Customer to preserve system and network resources.

Motorola will provide the Customer with the ability to temporarily suppress alerts reaching ActiveEye, enabling a co-managed approach to tuning and suppressing events or alarms. The SOC may permanently suppress particular alerts and alarms if not necessary for actionable threat detection.

1.2.6.3.14 Tuning Period Exception

The tuning period is considered to be the first thirty (30) days after each service module has been confirmed deployed and configured and starts receiving data. During the tuning period, Motorola may make recommendations to the Customer to adjust the configurations of their installed software so Services can be effectively delivered. Service Availability will not be applicable during the tuning period and responses or notifications may not be delivered. However, Motorola will provide responses and notifications during this period.

Motorola may continue to recommend necessary tuning changes after this period, with no impact on Service Availability.

1.2.6.3.15 Incident Priority Level Definitions and Response Times

Priority for alert-generated incident or Events of Interest is determined by the ActiveEye Platform analytics that process multiple incoming alert feeds, automation playbooks, and cybersecurity analyst knowledge.

Priority	Definition	Service Coverage
Critical	Security incidents that have caused, or are suspected to have caused significant damage to the functionality of the Customer's ASTRO 25 system or information stored within it. Efforts to recover from the incident may be significant. Examples: Malware that is not quarantined by anti-virus. Evidence that a monitored component has communicated with suspected malicious actors.	Response provided 24 hours, 7 days a week, including United States (U.S.) public holidays.
High	Security incidents that have localized impact and may become more serious if not quickly addressed. Effort to recover from the incident may be moderate to significant. Examples: Malware that is quarantined by antivirus. Multiple behaviors observed in the system that are consistent with known attacker techniques.	Response provided 24 hours, 7 days a week, including U.S. public holidays.

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Priority	Definition	Service Coverage
Medium	Security incidents that potentially indicate an attacker is performing reconnaissance or initial attempts at accessing the system. Effort to recover from the incident may be low to moderate. Examples include: Suspected unauthorized attempts to log into user accounts. Suspected unauthorized changes to system configurations, such as firewalls or user accounts. Observed failures of security components. Informational events. User account creation or deletion. Privilege change for existing accounts.	Response provided on standard business days, Monday through Friday 8 a.m. to 5 p.m. CST/CDT, excluding U.S. public holidays.
Low	These are typically service requests from the Customer.	Response provided on standard business days, Monday through Friday 8 a.m. to 5 p.m. CST/CDT, excluding U.S. public holidays.

1.2.6.3.15.1 Response Time Goals

Priority	Response Time
Critical	An SOC Cybersecurity Analyst will make contact with the customer technical representative within one (1) hour of the request for support being logged in the issue management system or the creation of an alert suggesting a cybersecurity incident that requires action. Continual effort will be maintained to identify the extent of the incident and provide actions for containment.
High	An SOC Cybersecurity Analyst will make contact with the customer technical representative within four (4) hours of the request for support being logged at the issue management system or the creation of an alert suggesting a cybersecurity incident that requires action. Continual effort will be maintained to identify the extent of the incident and provide actions for containment.
Medium	An SOC Cybersecurity Support Engineer will make contact with the customer technical representative within the next business day of the request for support being logged at the issue management system or the creation of an alert suggesting a cybersecurity incident that requires action.
Low	An SOC Cybersecurity Support Engineer will make contact with the Customer technical representative within seven business days of the logged request for support at the issue management system.

1.2.6.3.15.2 ActiveEye Platform Availability

The platform utilizes a multi-zone architecture which can recover from failures in different data collection, enhancement, analysis, and visualization tiers. Motorola will make commercially reasonable efforts to provide monthly availability of 99.9% for the ActiveEye Platform services. Service availability is subject to limited scheduled downtime for servicing and upgrades, as well

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as unscheduled and unanticipated downtime resulting from circumstances or events outside of Motorola's reasonable control, such as disruptions of, or damage, to the Customer's or a third-party's information or communications systems or equipment, telecommunication circuit availability/performance between Customer sites, any on-premises core and/or between on-premises equipment and the ActiveEye Platform.

1.2.6.3.15.3 ActiveEye Remote Security Sensor (AERSS)

One or more AERSS may be deployed as part of the MDR solution. The AERSS is configured with multiple local redundancy features such as hot-swap hard disk drives in a redundant drive array configuration and dual redundant power supplies.

The AERSS and all components of ActiveEye are monitored by a dedicated Site Reliability Engineering team. In cases of hardware failure of the AERSS, Motorola will provide, subject to active service subscriptions in the Customer contract, onsite services to repair the AERSS and restore service. AERSS operation and outage troubleshooting requires network connection to the ActiveEye Platform which may be impacted by customer configuration changes, telecommunications connectivity, and/or customer network issues/outages.

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2200 Executive Airport Way
8-pos Backup Dispatch Site

Motorola Azure Cloud

Utilities Tower
Backup Core,
Geo-Prime,
10-ch RF Subsite

ACS

Playa del Sol
10-ch RF Subsite

State of Florida Tower
Zone Core, Prime,
10-ch RF Subsite

1300 W. Broward Blvd
6-pos Main Dispatch Site

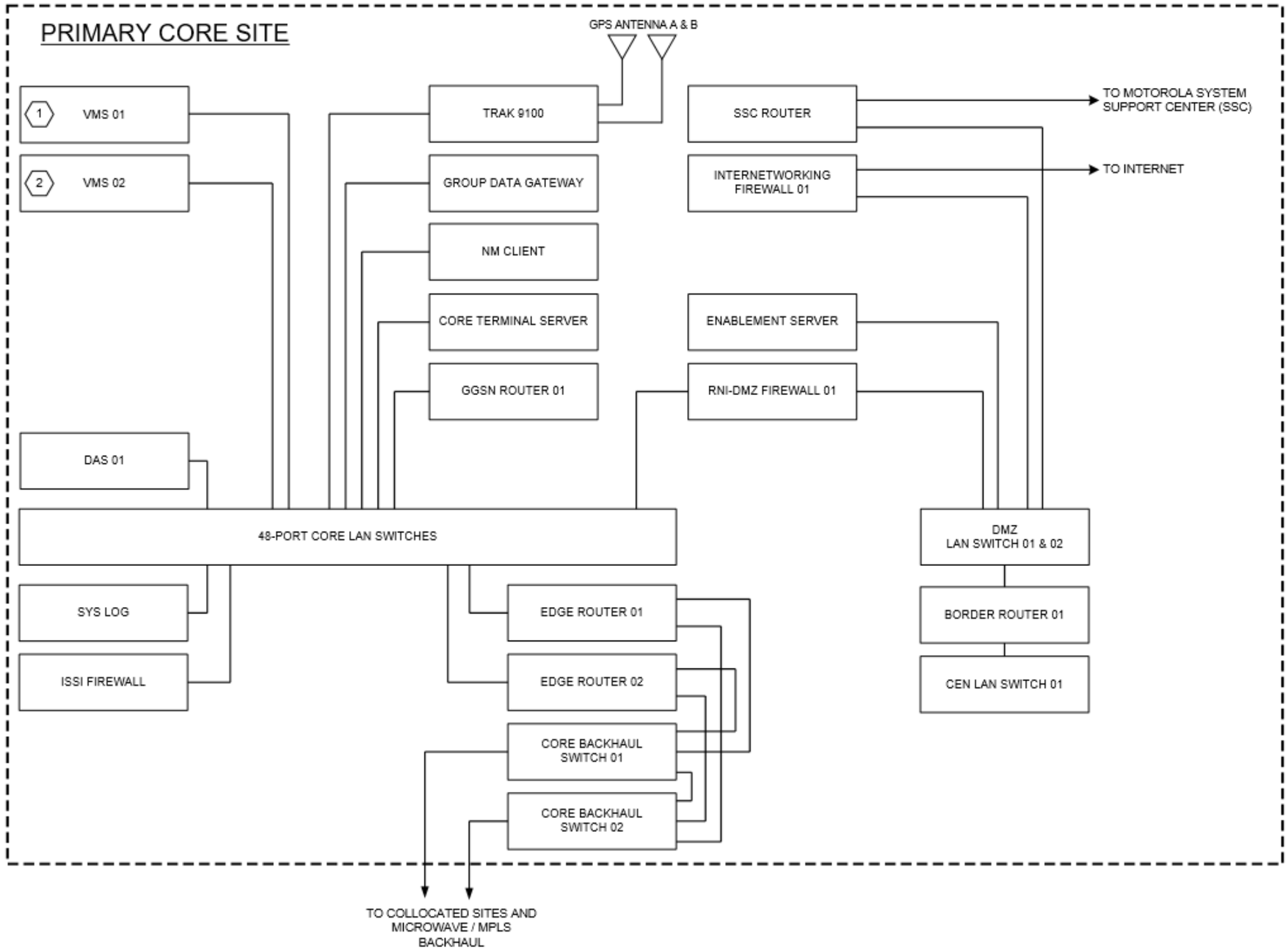
Point of Americas
10-ch RF Subsite

Proposed microwave path
Proposed *ASTRO Connectivity Services* (ACS) connectivity

DATE DRAWN 12/17/2025	MOTOROLA SOLUTIONS	
ENGINEERS	PROPOSED CITY OF FORT LAUDERDALE ASTRO 25 SYSTEM TOPOLOGY	
SOURCE System Engineering		
DRAWN BY AJD	SCALE NONE	Rev 0 (V 1.0) 0
CUSTOMER APPROVAL	DRAWING NUMBER	REVISED SITE

ASTRO 25 ZONE CORE

PRIMARY CORE SITE



SHEET NOTES

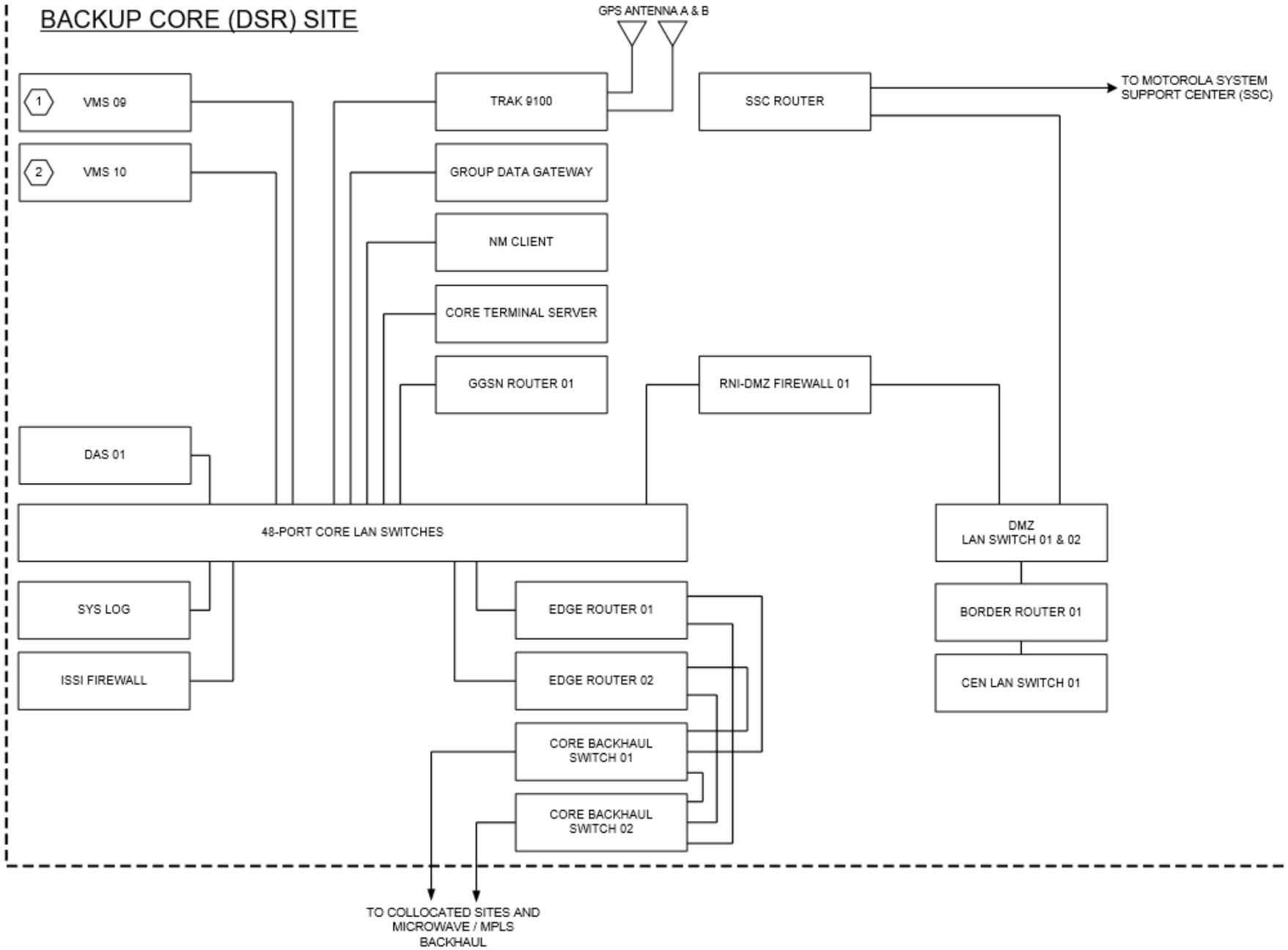
1. VMS 01:
   - ATR
   - AUC
   - BAR
   - CEMS
   - ZONE DC
   - GOG
   - IPCAP
   - ISGW
   - IV
   - LMP
   - PDG-CONV
   - PDG-IV&D
   - UCS
   - SSS
   - SYSLOG
   - VCENTER
   - ZC
   - ZSS

2. VMS 02:
   - ATR
   - SYSTEM DC
   - GOG
   - IPCAP
   - ISGW
   - LMP
   - LICENSE MGR
   - PDG-CONV
   - PDG-IV&D
   - UBM
   - UNC
   - VCENTER

DATE DRAWN 12/17/2025	MOTOROLA SOLUTIONS	
ENGINEERS	ASTRO 25 ZONE CORE BLOCK DIAGRAM	
SOURCE System Engineering		
DRAWN BY AJD	SCALE NONE	Rev 0 (V 1.0) 0
CUSTOMER APPROVAL	DRAWING NUMBER	REVISED SITE

ASTRO 25 BACKUP ZONE CORE (DSR)

BACKUP CORE (DSR) SITE



SHEET NOTES

1. VMS 09:
   - ATR
   - AUC
   - BAR
   - CEMS
   - ZONE DC
   - IPCAP
   - ISGW
   - IV
   - LMP
   - PDG-CONV
   - PDG-IV&D
   - UCS
   - SSS
   - SYSLOG
   - VCENTER
   - ZC
   - ZSS

2. VMS 10:
   - ATR
   - SYSTEM DC
   - LICENSE MGR
   - PDG-CONV
   - PDG-IV&D
   - IPCAP
   - UBM
   - UNC

DATE DRAWN 12/17/2025	MOTOROLA SOLUTIONS	
ENGINEERS	ASTRO 25 BACKUP ZONE CORE (DSR) BLOCK DIAGRAM	
SOURCE System Engineering		
DRAWN BY AJD	SCALE NONE	Rev 0 (V 1.0) 0
CUSTOMER APPROVAL	DRAWING NUMBER	REVISED SITE

Simulcast Co-Located RF Sub-Site and Prime Site (State of Florida Tower)

Simulcast RF Sub-Site

800 MHz Rx

TTA

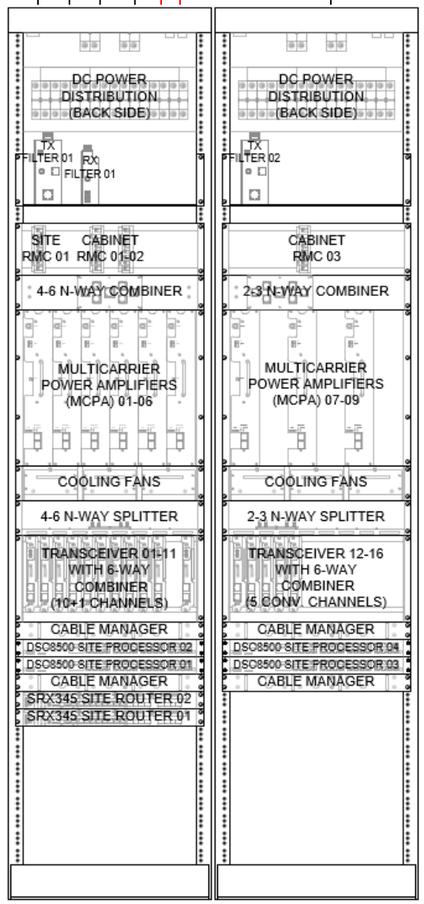
RX Test

TTA Control Unit

800 MHz Tx1

GNSS (GPS) antennas

800 MHz Tx2 (mutual aid)



D Series rack #1
Trunked channels 1-10
+ 11th redundant transceiver

D Series rack #2
Conventional
channels 1-5

ASTRO Connectivity Services

ACS BACKUP LTE MODEM

ACS ROUTER

Microwave

Microwave Network

Microwave Equipment

NOKIA SAR-8



NOKIA SAR-8

Collocated Simulcast Virtualized Prime Site

Backhaul Switch



Prime Access Router (SRX 1500)



GNSS (GPS) antennas

DSC 8000 1

DSC 8000 2

DATE DRAWN 12/17/2025	MOTOROLA SOLUTIONS	
ENGINEERS	COLLOCATED SIMULCAST PRIME & RF SUBSITE BLOCK DIAGRAM	
SOURCE System Engineering		
DRAWN BY AJD	SCALE NONE	Rev 0 (V 1.0) 0
CUSTOMER APPROVAL	DRAWING NUMBER	REVISED SITE

Simulcast Co-Located RF Sub-Site and Prime Site (Utilities Tower)

Simulcast RF Sub-Site

800 MHz Rx

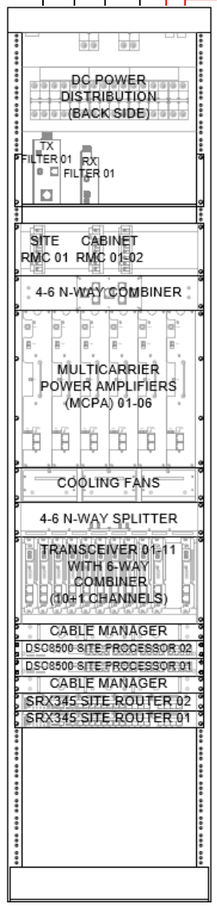
800 MHz Tx1

TTA

GNSS (GPS) antennas

RX Test

TTA Control Unit



D Series rack #1
Trunked channels 1-10
+ 11th redundant transceiver

ASTRO Connectivity Services

ACS BACKUP LTE MODEM

ACS ROUTER

Microwave

Microwave Network

To ASTRO Zone Core

Microwave Equipment

NOKIA SAR-8

Backhaul Switch

Prime Access Router (SRX 1500)

GNSS (GPS) antennas

DSC 8000 1

DSC 8000 2

Collocated Simulcast Virtualized Geo-Prime Site

DATE DRAWN 12/17/2025	MOTOROLA SOLUTIONS	
ENGINEERS	COLLOCATED SIMULCAST GEOPRIME & RF SUBSITE BLOCK DIAGRAM	
SOURCE System Engineering		
DRAWN BY AJD	SCALE NONE	Rev 0 (V 1.0) 0
CUSTOMER APPROVAL	DRAWING NUMBER	REVISED SITE

Simulcast 10 Channel RF Sub-Site

800 MHz Rx

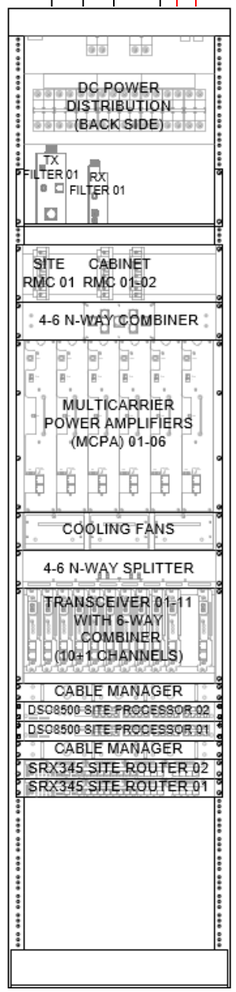
TTA

RX Test

TTA Control Unit

800 MHz Tx

GNSS (GPS) antennas



D Series rack #1
Trunked channels 1-10
+ 11th redundant transceiver

Microwave

Microwave Network

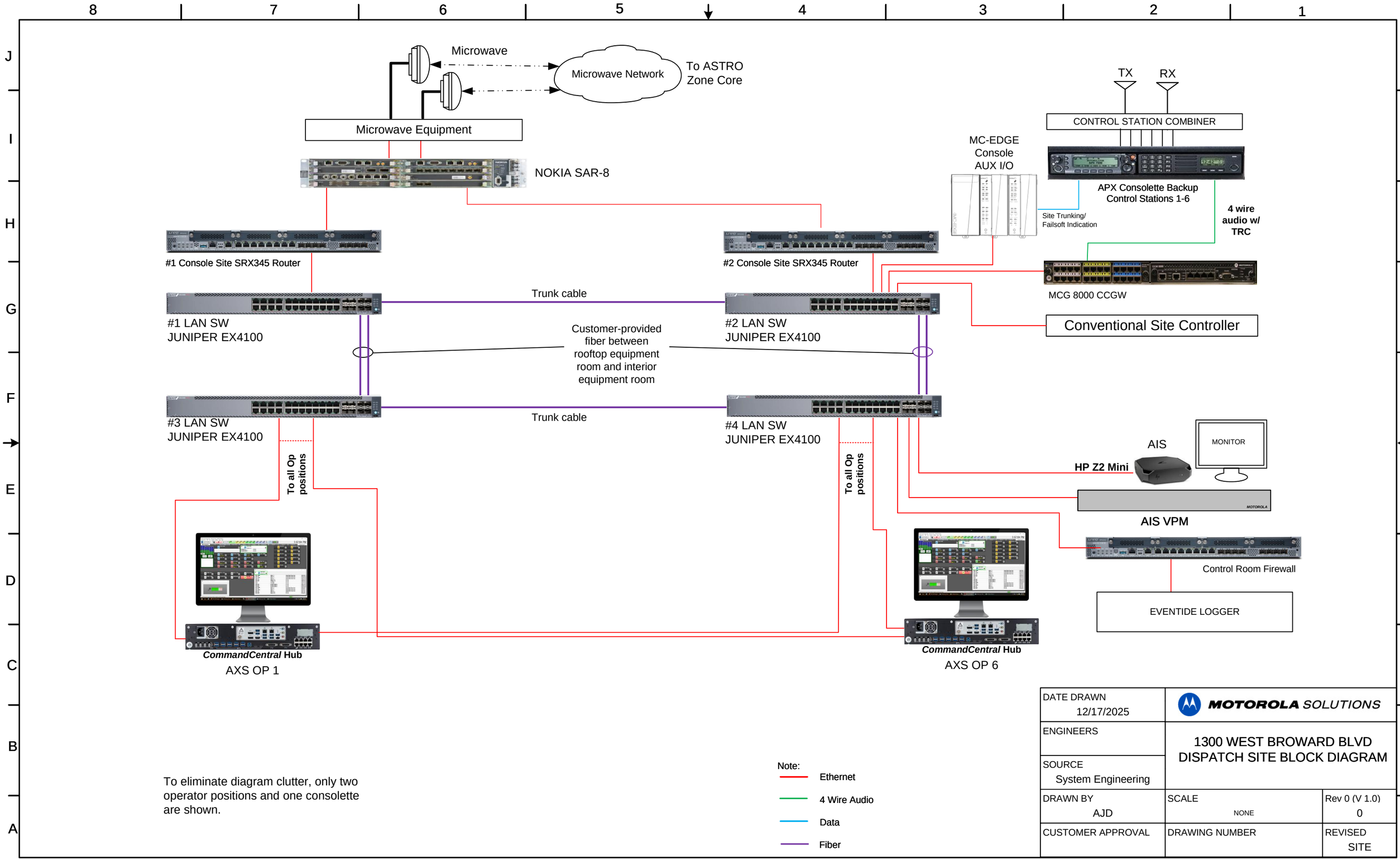
To Prime Sites

Microwave Equipment



NOKIA SAR-8

DATE DRAWN 12/17/2025	MOTOROLA SOLUTIONS	
ENGINEERS	10-CH SIMULCAST RF SUBSITE BLOCK DIAGRAM	
SOURCE System Engineering		
DRAWN BY AJD	SCALE NONE	Rev 0 (V 1.0) 0
CUSTOMER APPROVAL	DRAWING NUMBER	REVISED SITE



To eliminate diagram clutter, only two operator positions and one consolette are shown.

DATE DRAWN 12/17/2025	MOTOROLA SOLUTIONS	
ENGINEERS	1300 WEST BROWARD BLVD DISPATCH SITE BLOCK DIAGRAM	
SOURCE System Engineering		
DRAWN BY AJD	SCALE NONE	Rev 0 (V 1.0) 0
CUSTOMER APPROVAL	DRAWING NUMBER	REVISED SITE

Microwave

Microwave Network

To ASTRO Zone Core

Microwave Equipment

NOKIA SAR-8

#1 Console Site SRX345 Router

#2 Console Site SRX345 Router

Trunk DAC cables

#1 LAN SW
JUNIPER EX4100

#2 LAN SW
JUNIPER EX4100

To all Op positions

To all Op positions

Conventional Site Controller

MC-EDGE
Console
AUX I/O

4 wire audio w/ TRC

MCG 8000 CCGW

TX

RX

CONTROL STATION COMBINER

APX Consolette Backup Control Stations 1-8

CommandCentral Hub
AXS OP 1

To LAN Switch 2

CommandCentral Hub
AXS OP 8

To LAN Switch1

Site Trunking/Failsoft Indication

To eliminate diagram clutter, only two operator positions and one consolette are shown.

Note:

- Ethernet
- 4 Wire Audio
- Data

DATE DRAWN 12/17/2025	MOTOROLA SOLUTIONS	
ENGINEERS	2200 EXECUTIVE AIRPORT WAY DISPATCH SITE BLOCK DIAGRAM	
SOURCE System Engineering		
DRAWN BY AJD	SCALE NONE	Rev 0 (V 1.0) 0
CUSTOMER APPROVAL	DRAWING NUMBER	REVISED SITE

STATE OF FLORIDA TOWER – SHEET 1 of 2

ROW 1

Battery Stack #1

2000 Ah BATTERY
BANK
in 3-wide x 8-high
configuration

8520 lb,
43.27"x97.07"x27.46"
(WxHxD)

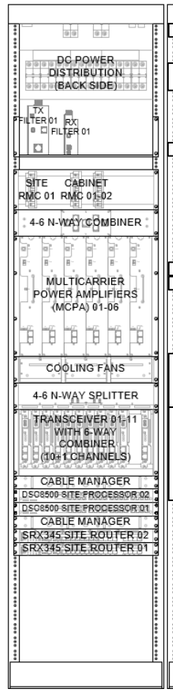
Battery Stack #2

2000 Ah BATTERY
BANK
in 3-wide x 8-high
configuration

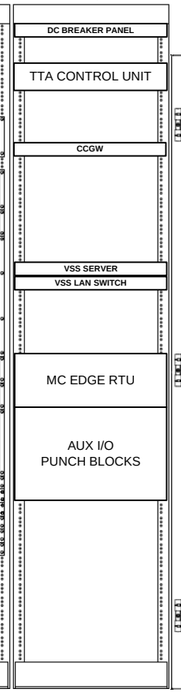
8520 lb,
43.27"x97.07"x27.46"
(WxHxD)

ROW 2

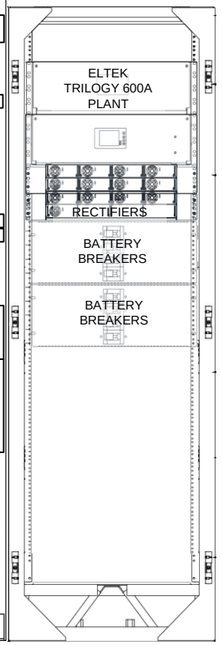
D Series Rack



Auxiliary Rack



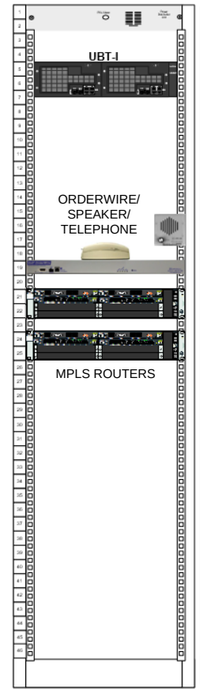
DC Power Enclosed Cabinet



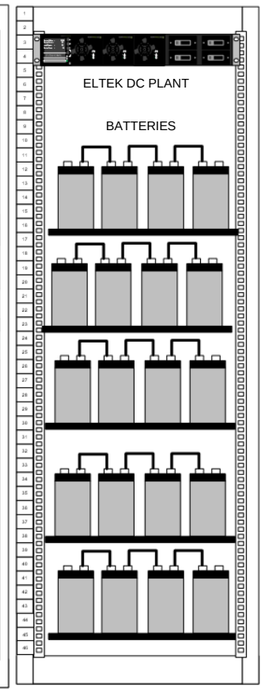
ROW 3

(Dehydrator not shown.)

Microwave Rack



Microwave DC Plant



Rack positions and equipment layout are preliminary and subject to adjustment during detailed site planning.

REV	DATE	ENG	DESCRIPTION
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O	12/1/2025	AD	ORIGINAL RELEASE

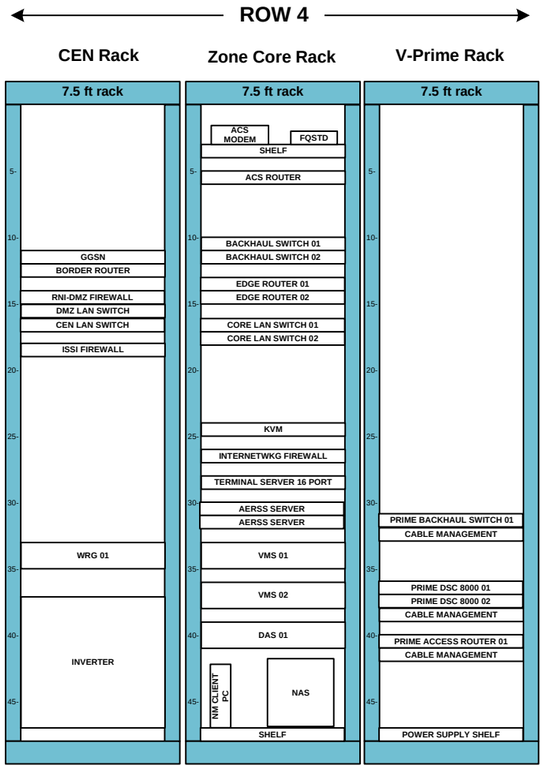
MOTOROLA SOLUTIONS

PROJECT:
City of Fort Lauderdale 800 MHz ASTRO 25 System

TITLE
State of Florida Tower – Preliminary Rack Elevation Drawing – SHEET 1 OF 2

CONTRACT	ENGINEER	PROGRAM MGR	SCALE	SIZE
	Andy Dent		0.6' = 1'-0"	B
PROGRAM	**DRAWN**	**CHECKED**	**SHEET**	**REV**
VISIO 2016	AD		1 OF 1	O
FILE	**DATE**	**CODE IDENT**	**DWG NO**	
	12/1/2025			

STATE OF FLORIDA TOWER – SHEET 2 of 2



Rack positions and equipment layout are preliminary and subject to adjustment during detailed site planning.

REV	DATE	ENG	DESCRIPTION
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O	12/1/2025	AD	ORIGINAL RELEASE

MOTOROLA SOLUTIONS

PROJECT: City of Fort Lauderdale 800 MHz ASTRO 25 System

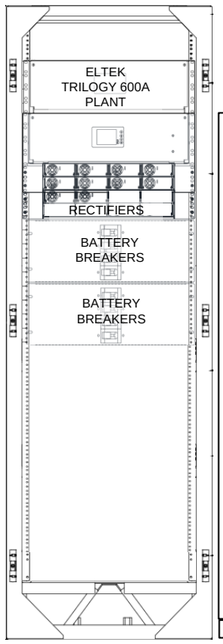
TITLE: State of Florida Tower – Preliminary Rack Elevation Drawing – SHEET 2 OF 2

CONTRACT	ENGINEER: Andy Dent	PROGRAM MGR	SCALE: 0.6' = 1'-0"	SIZE: B
PROGRAM: VISIO 2016	DRAWN: AD	CHECKED	SHEET: 1 OF 1	REV: O
FILE	DATE: 12/1/2025	CODE IDENT	DWG NO	

UTILITIES – SHEET 1 of 2

ROW 1

DC Power Enclosed Cabinet



Battery Stack #1

1105 Ah BATTERY BANK
in 3-wide x 8-high configuration

4777 lbs
35.58"x78.11"x23.5"
(WxHxD)

Battery Stack #2

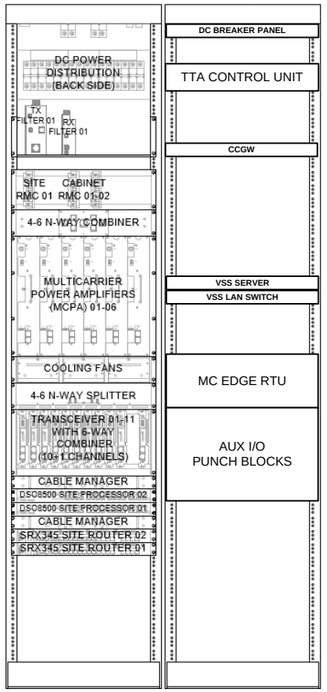
1105 Ah BATTERY BANK
in 3-wide x 8-high configuration

4777 lbs
35.58"x78.11"x23.5"
(WxHxD)

ROW 2

D Series Rack

Auxiliary Rack

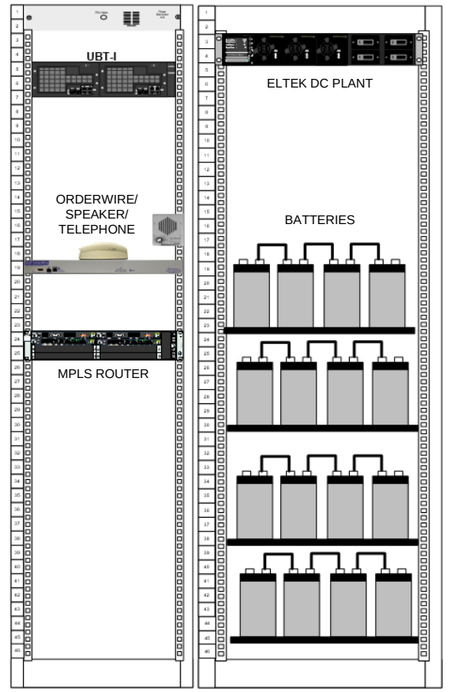


ROW 3

(Dehydrator not shown.)

Microwave Rack

Microwave DC Plant



Rack positions and equipment layout are preliminary and subject to adjustment during detailed site planning.

REV	DATE	ENG	DESCRIPTION
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O	12/1/2025	AD	ORIGINAL RELEASE

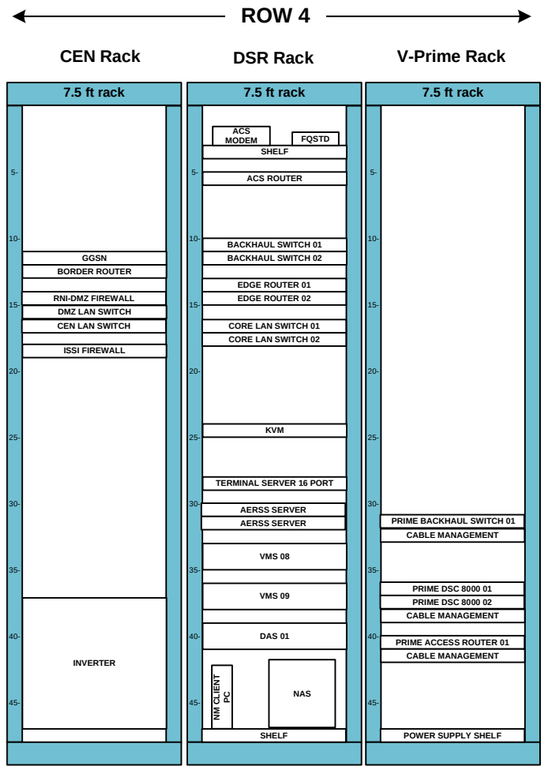
MOTOROLA SOLUTIONS

PROJECT:
City of Fort Lauderdale 800 MHz ASTRO 25 System

TITLE
Utilities – Preliminary Rack Elevation Drawing – SHEET 1 OF 2

CONTRACT	ENGINEER	PROGRAM MGR	SCALE	SIZE
	Andy Dent		0.6' = 1'-0"	B
PROGRAM	**DRAWN**	**CHECKED**	**SHEET**	**REV**
VISIO 2016	AD		1 OF 1	O
FILE	**DATE**	**CODE IDENT**	**DWG NO**	
	12/1/2025			

UTILITIES – SHEET 2 of 2



Rack positions and equipment layout are preliminary and subject to adjustment during detailed site planning.

REV	DATE	ENG	DESCRIPTION
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O	12/1/2025	AD	ORIGINAL RELEASE

MOTOROLA SOLUTIONS

PROJECT: City of Fort Lauderdale 800 MHz ASTRO 25 System

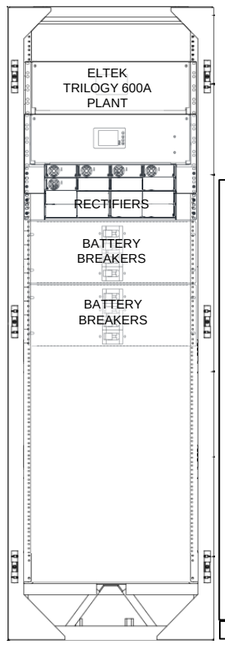
TITLE: Utilities – Preliminary Rack Elevation Drawing – SHEET 2 OF 2

CONTRACT	ENGINEER	PROGRAM MGR	SCALE	SIZE
	Andy Dent		0.6' = 1'-0"	B
PROGRAM	**DRAWN**	**CHECKED**	**SHEET**	**REV**
VISIO 2016	AD		1 OF 1	O
FILE	**DATE**	**CODE IDENT**	**DWG NO**	
	12/1/2025			

PLAYA DEL SOL

ROW 1

DC Power Enclosed Cabinet



Battery Stack #1

595 Ah BATTERY BANK
in 4-wide x 6-high configuration

2664 lbs
27.41"x60.85"x23.5"
(WxHxD)

Battery Stack #2

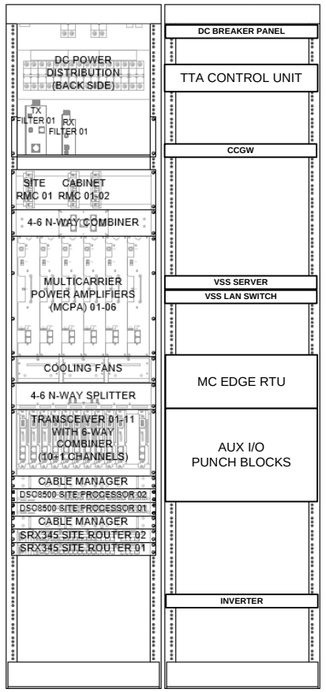
595 Ah BATTERY BANK
in 4-wide x 6-high configuration

2664 lbs
27.41"x60.85"x23.5"
(WxHxD)

ROW 2

D Series Rack

Auxiliary Rack

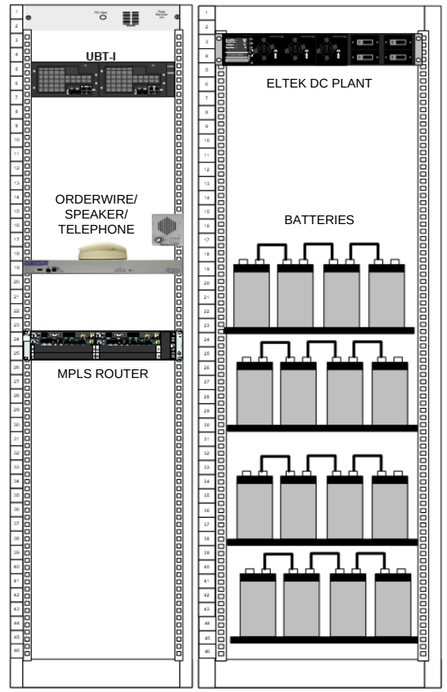


ROW 3

(Dehydrator not shown.)

Microwave Rack

Microwave DC Plant



Rack positions and equipment layout are preliminary and subject to adjustment during detailed site planning.

REV	DATE	ENG	DESCRIPTION
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O	12/1/2025	AD	ORIGINAL RELEASE

MOTOROLA SOLUTIONS

PROJECT: City of Fort Lauderdale 800 MHz ASTRO 25 System

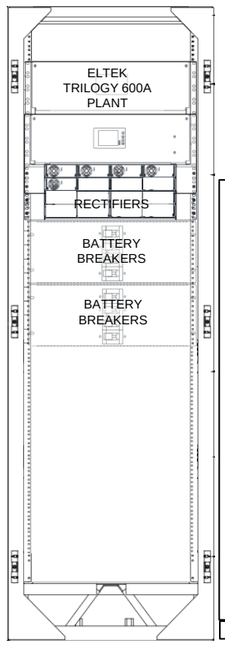
TITLE: Playa del Sol – Preliminary Rack Elevation Drawing

CONTRACT	ENGINEER	PROGRAM MGR	SCALE	SIZE
	Andy Dent		0.6' = 1'-0"	B
PROGRAM	**DRAWN**	**CHECKED**	**SHEET**	**REV**
VISIO 2016	AD		1 OF 1	O
FILE	**DATE**	**CODE IDENT**	**DWG NO**	
	12/1/2025			

POINT OF AMERICAS

ROW 1

DC Power Enclosed Cabinet



Battery Stack #1

595 Ah BATTERY BANK
in 4-wide x 6-high configuration

2664 lbs
27.41"x60.85"x23.5"
(WxHxD)

Battery Stack #2

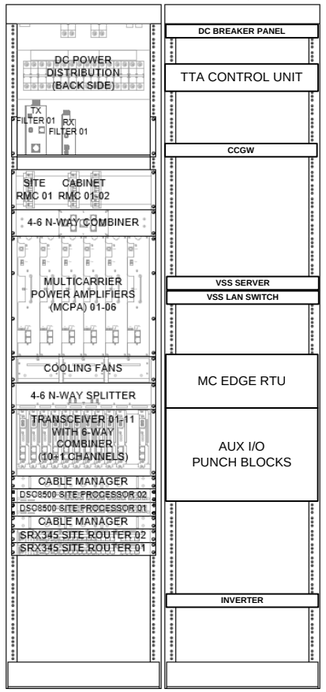
595 Ah BATTERY BANK
in 4-wide x 6-high configuration

2664 lbs
27.41"x60.85"x23.5"
(WxHxD)

ROW 2

D Series Rack

Auxiliary Rack

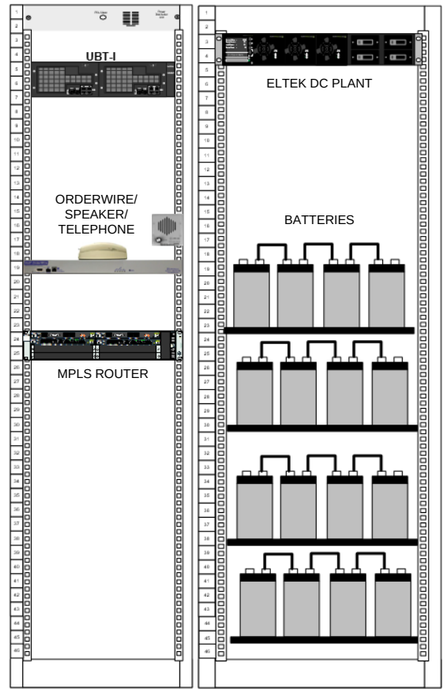


ROW 3

(Dehydrator not shown.)

Microwave Rack

Microwave DC Plant



Rack positions and equipment layout are preliminary and subject to adjustment during detailed site planning.

REV	DATE	ENG	DESCRIPTION
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O	12/1/2025	AD	ORIGINAL RELEASE

MOTOROLA SOLUTIONS

PROJECT: City of Fort Lauderdale 800 MHz ASTRO 25 System

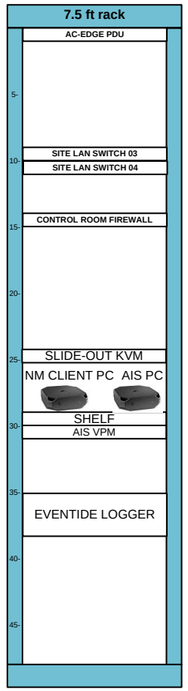
TITLE: Point of Americas – Preliminary Rack Elevation Drawing

CONTRACT	ENGINEER	PROGRAM MGR	SCALE	SIZE
	Andy Dent		0.6' = 1'-0"	B
PROGRAM	**DRAWN**	**CHECKED**	**SHEET**	**REV**
VISIO 2016	AD		1 OF 1	O
FILE	**DATE**	**CODE IDENT**	**DWG NO**	
	12/1/2025			

1300 WEST BROWARD BLVD. DISPATCH

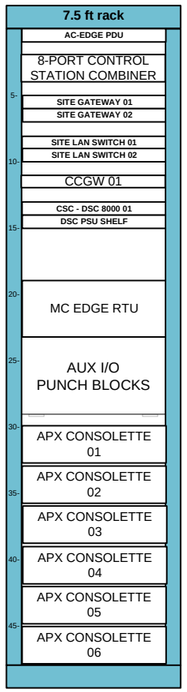
Dispatch Equipment Room

Network Rack

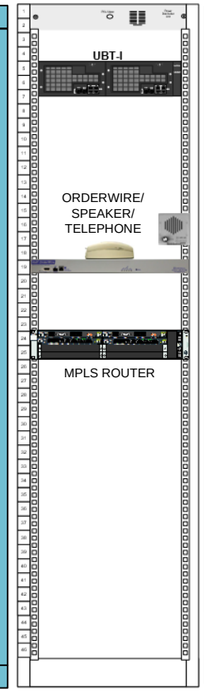


Rooftop Equipment Room

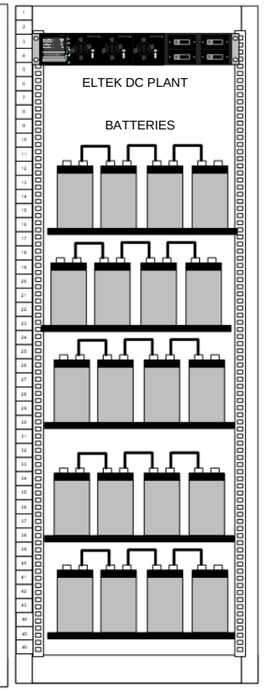
Consolette Rack



Microwave Rack



Microwave DC Plant



(Dehydrator not shown.)

Rack positions and equipment layout are preliminary and subject to adjustment during detailed site planning.

REV	DATE	ENG	DESCRIPTION
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O	12/5/2025	AD	ORIGINAL RELEASE

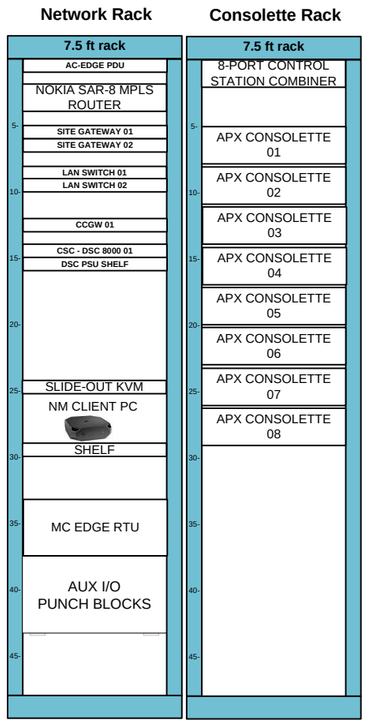
MOTOROLA SOLUTIONS

PROJECT: City of Fort Lauderdale 800 MHz ASTRO 25 System

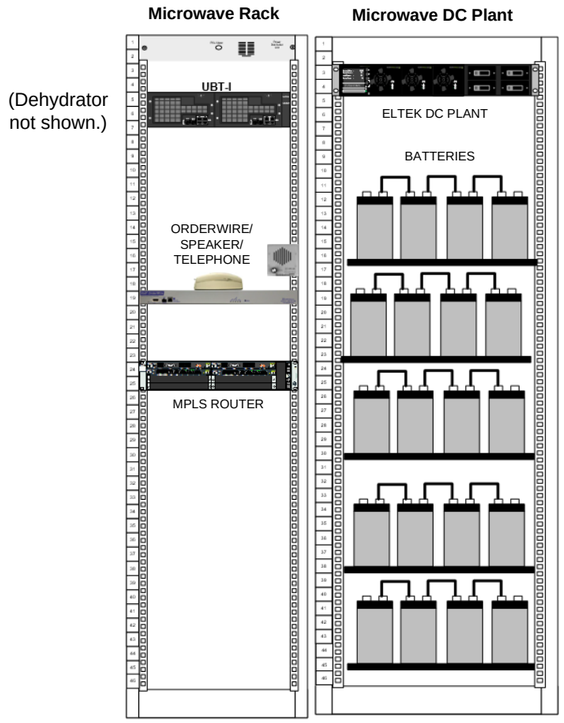
TITLE: 1300 West Broward Blvd. Dispatch Site Back Office – Rack Elevation Drawing

CONTRACT	ENGINEER	PROGRAM MGR	SCALE	SIZE
	Andy Dent		0.6' = 1'-0"	B
PROGRAM	**DRAWN**	**CHECKED**	**SHEET**	**REV**
VISIO 2016	AD		1 OF 1	O
FILE	**DATE**	**CODE IDENT**	**DWG NO**	
	12/5/2025			

2200 EXECUTIVE AIRPORT WAY BACKUP DISPATCH



(Dehydrator not shown.)



Rack positions and equipment layout are preliminary and subject to adjustment during detailed site planning.

REV	DATE	ENG	DESCRIPTION
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O	12/1/2025	AD	ORIGINAL RELEASE

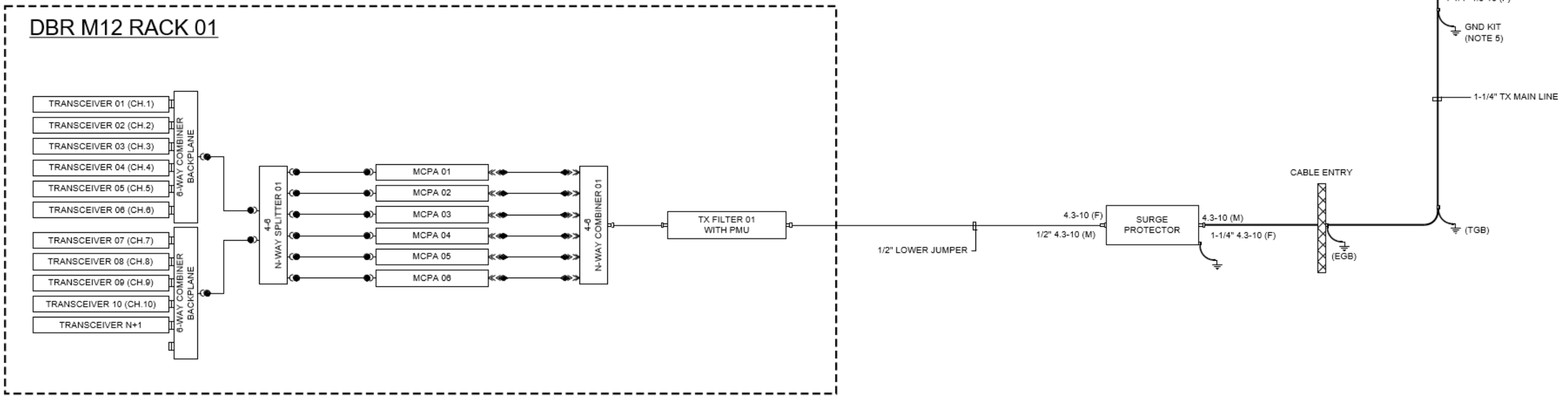
MOTOROLA SOLUTIONS

PROJECT: City of Fort Lauderdale 800 MHz ASTRO 25 System

TITLE: 2200 Executive Airport Way Backup Dispatch Back Office – Rack Elevation Drawing

CONTRACT	ENGINEER	PROGRAM MGR	SCALE	SIZE
	Andy Dent		0.6' = 1'-0"	B
PROGRAM: VISIO 2016	DRAWN: AD	CHECKED	SHEET: 1 OF 1	REV: O
FILE	DATE: 12/1/2025	CODE IDENT	DWG NO	

TRANSMIT ANTENNA SYSTEM WITHOUT MUTUAL AID CHANNELS



REV	DATE	ENG	DESCRIPTION
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O	12/5/2025	AD	ORIGINAL RELEASE

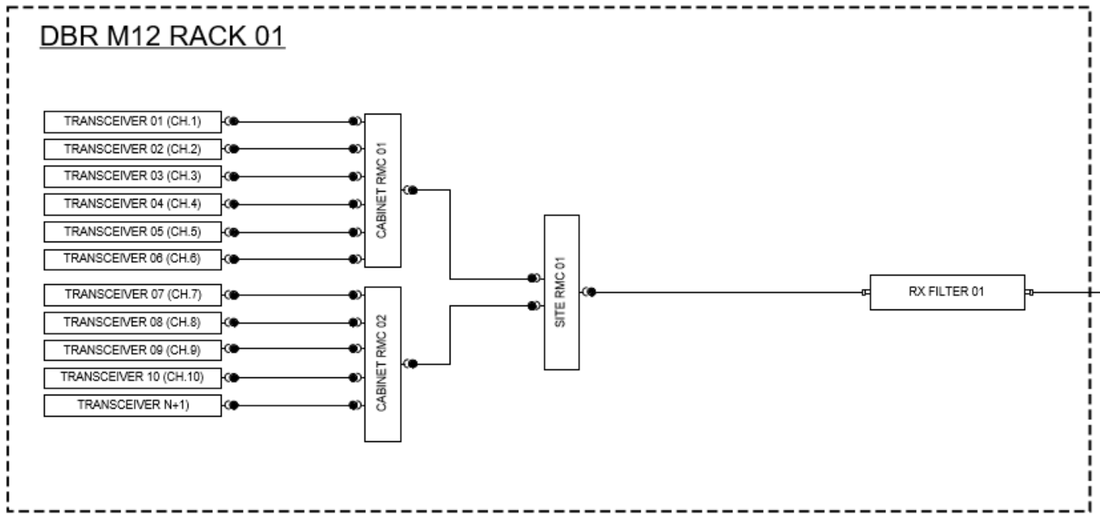
MOTOROLA SOLUTIONS

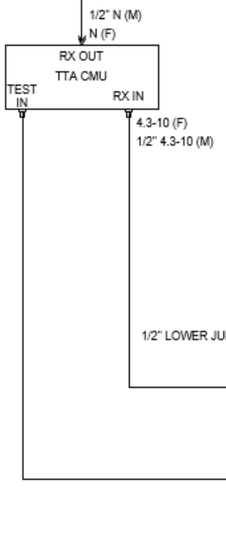
PROJECT: City of Fort Lauderdale 800 MHz ASTRO 25 System

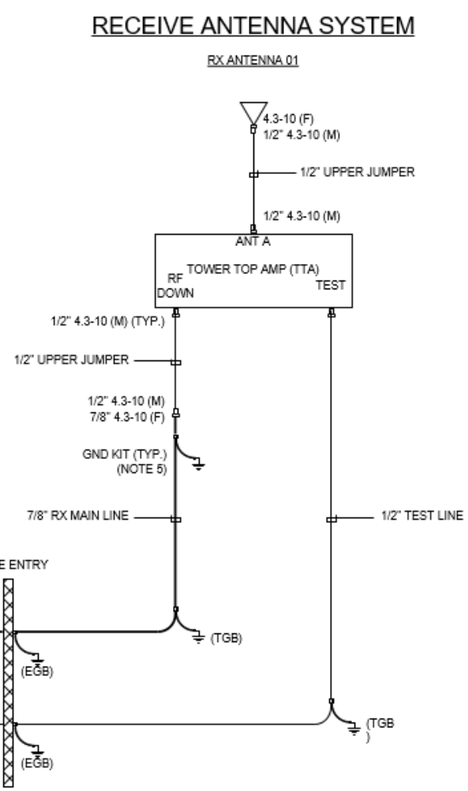
TITLE: Transmit Antenna Schematic – RF Sub-sites without Mutual Aid

CONTRACT	ENGINEER	PROGRAM MGR	SCALE	SIZE
	Andy Dent		0.6' = 1'-0"	B
PROGRAM	DRAWN	CHECKED	SHEET	REV
VISIO 2016	AD		1 OF 1	O
FILE	DATE	CODE IDENT	DWG NO	
	12/5/2025			

RECEIVE ANTENNA SYSTEM WITHOUT MUTUAL AID CHANNELS







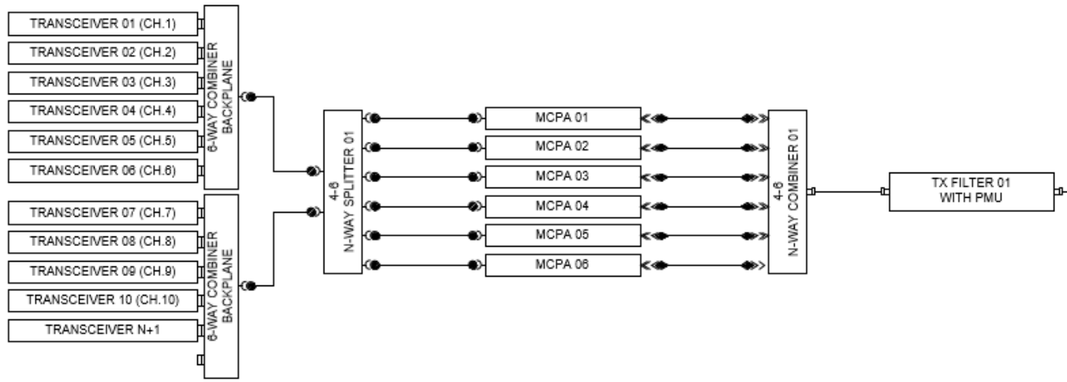
REV	DATE	ENG	DESCRIPTION
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O	12/5/2025	AD	ORIGINAL RELEASE

MOTOROLA SOLUTIONS

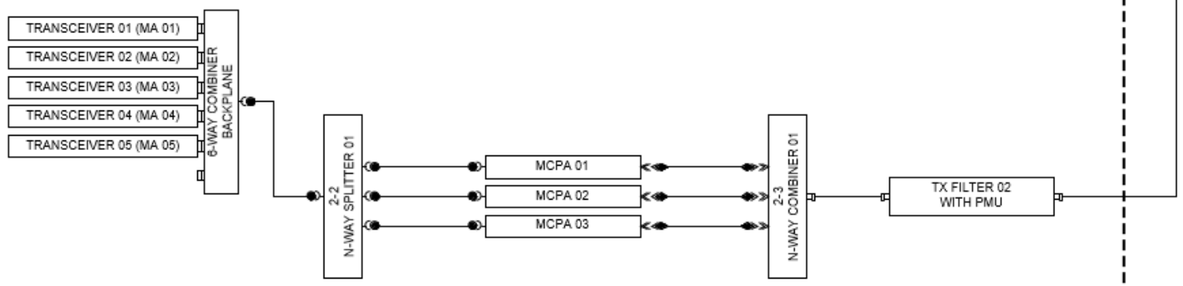
PROJECT: City of Fort Lauderdale 800 MHz ASTRO 25 System				
TITLE: Receive Antenna Schematic – RF Sub-sites without Mutual Aid				
CONTRACT	ENGINEER: Andy Dent	PROGRAM MGR	SCALE: 0.6' = 1'-0"	SIZE: B
PROGRAM: VISIO 2016	DRAWN: AD	CHECKED	SHEET: 1 OF 1	REV: O
FILE	DATE: 12/5/2025	CODE IDENT	DWG NO	

TRANSMIT ANTENNA SYSTEM WITH MUTUAL AID CHANNELS

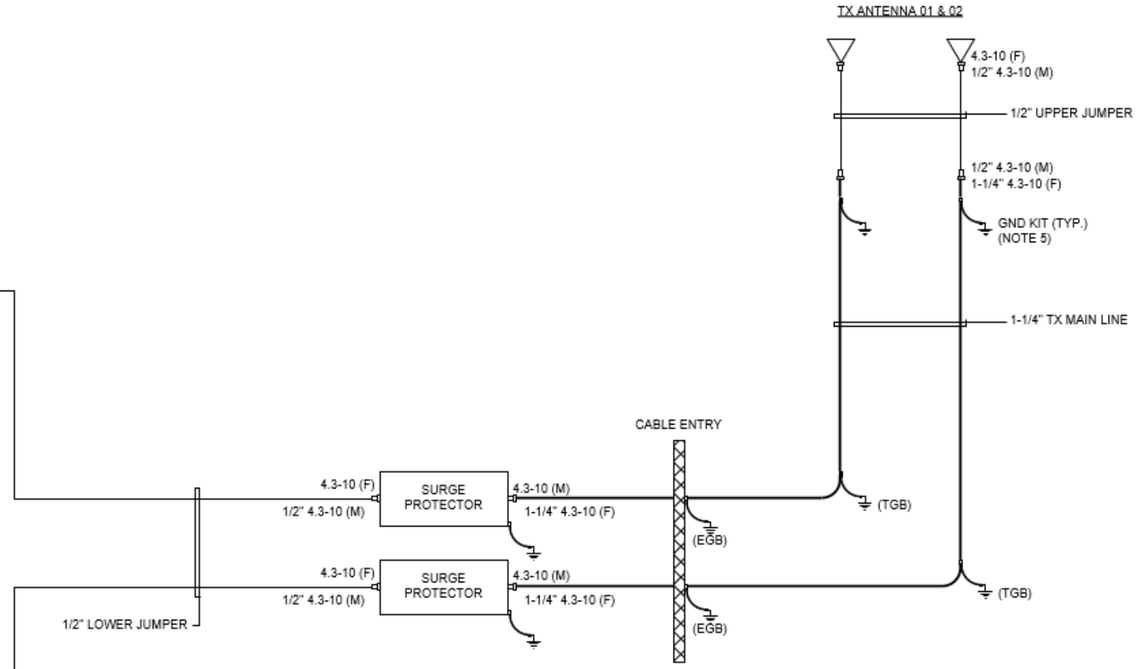
DBR M12 RACK 01



DBR M12 RACK 02



TRANSMIT ANTENNA SYSTEM



REV	DATE	ENG	DESCRIPTION
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O	12/5/2025	AD	ORIGINAL RELEASE

MOTOROLA SOLUTIONS

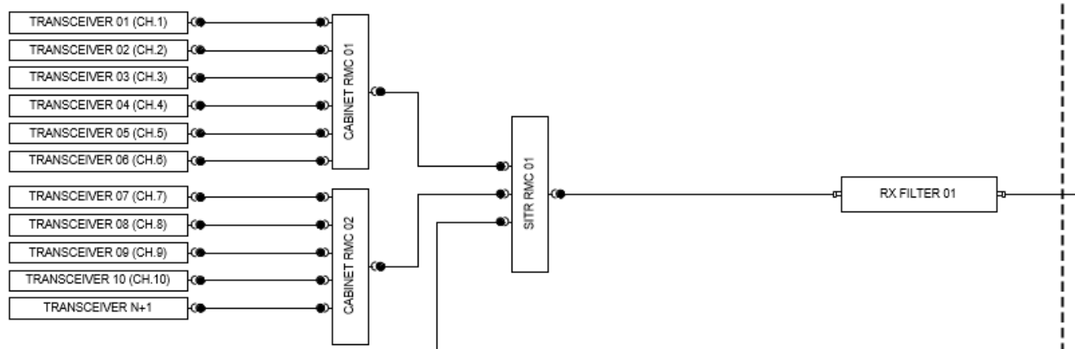
PROJECT: City of Fort Lauderdale 800 MHz ASTRO 25 System

TITLE: Transmit Antenna Schematic – State of Florida Tower with Mutual Aid

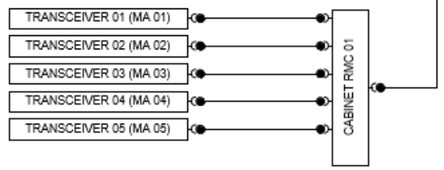
CONTRACT	ENGINEER	PROGRAM MGR	SCALE	SIZE
	Andy Dent		0.6' = 1'-0"	B
PROGRAM	**DRAWN**	**CHECKED**	**SHEET**	**REV**
VISIO 2016	AD		1 OF 1	O
FILE	**DATE**	**CODE IDENT**	**DWG NO**	
	12/5/2025			

RECEIVE ANTENNA SYSTEM WITH MUTUAL AID CHANNELS

DBR M12 RACK 01

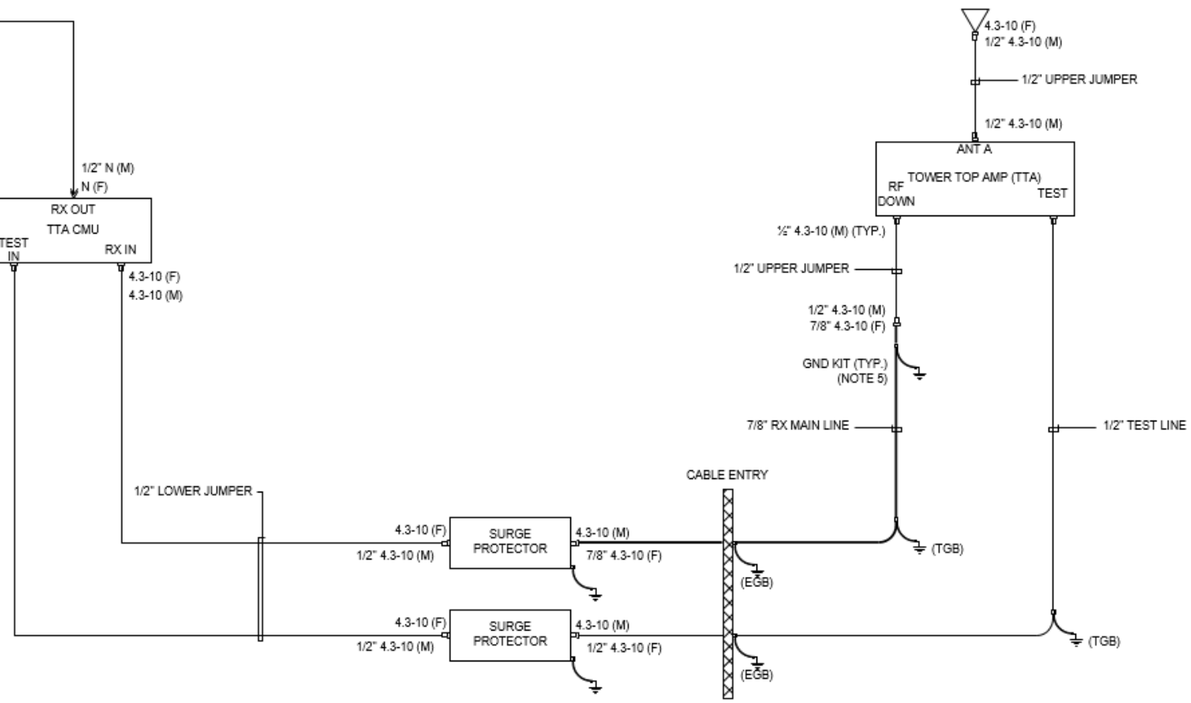


DBR M12 RACK 02



RECEIVE ANTENNA SYSTEM

RX ANTENNA 01



REV	DATE	ENG	DESCRIPTION
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A			
O	12/5/2025	AD	ORIGINAL RELEASE

MOTOROLA SOLUTIONS

PROJECT: City of Fort Lauderdale 800 MHz ASTRO 25 System				
TITLE: Receive Antenna Schematic – State of Florida Tower with Mutual Aid				
CONTRACT	ENGINEER: Andy Dent	PROGRAM MGR	SCALE: 0.6' = 1'-0"	SIZE: B
PROGRAM: VISIO 2016	DRAWN: AD	CHECKED	SHEET: 1 OF 1	REV: O
FILE	DATE: 12/5/2025	CODE IDENT	DWG NO	

MOTOROLA SOLUTIONS

City of Fort Lauderdale

Attachment 18 - Configuration Diagrams & Coverage Maps

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.4.15.5 Coverage Description

Radio Coverage

Guaranteed Radio Coverage for the City

Overview and Coverage Guarantee

Motorola Solutions guarantees the coverage of the proposed system, and will prove system coverage performance meets or exceeds our guarantee by means of a comprehensive drive testing process designed to be witnessed and participated in by City personnel.

Motorola Solutions brings industry-leading expertise and tools to its coverage design process that have been honed over decades of experience in designing LMR coverage. Our offered coverage design is highly optimized, representing the culmination of a massive number of iterations that tested numerous variables, such as antenna models, heights, azimuths, down-tilts and power levels. The City can be assured that Motorola's coverage predictions represent the best possible coverage that the available RF sites can yield for the defined service areas.

Our guarantees do assume the granting of a waiver to the 3 mile 40 dBµV/m contour requirement of Region 9 Regional Planning Committee's Radio Communications Plan, as noted in the Coverage Acceptance Test Plan. Our coverage guarantees are expressed as service area reliabilities, except those that apply to specific buildings. Our guarantees are summarized in the table below and are defined more formally in the Coverage Acceptance Test Plan.

Table: Coverage Guarantee Summary

Service Area or Specific Buildings	Basis of guarantee	Subscriber Type	Building Loss	Guaranteed Reliability	
The cities of Fort Lauderdale, Wilton Manors and Oakland Park, plus 2 miles beyond city limits	Service area	Portable	0 dB	97%	
The cities of Fort Lauderdale, Wilton Manors and Oakland Park, plus 2 miles beyond city limits	Service area	Mobile	0 dB	97%	
The cities of Fort Lauderdale, Wilton	Service	Portable	15 dB	97%	
Manors and Oakland Park, plus 2 miles beyond city limits		area			
The cities of Fort Lauderdale, Wilton Manors and Oakland Park, plus 1 mile beyond city limits		Service area	Portable	20 dB	96%
Critical Buildings per RFP Appendix D		Specific Buildings	Portable	20 dB	95%

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Defined list of schools per supplied shapefile	Specific Buildings	Portable	25 dB	95%

Guarantees that **exceed** the RFP requirement are highlighted in green.

The mobile subscriber guarantee is based on the use of a mobile radio connected to a 3 dBd low profile mobile antenna, mounted on a vehicle's trunk. The portable subscriber guarantee is based on the use of a portable APX N50 radio with a 10 cm stubby antenna worn in a belt swivel case on hip with remote speaker microphone. Guarantees are based on Delivered Audio Quality of DAQ-3.4, defined by TSB-88 as "Speech understandable with repetition only rarely required. Some noise/distortion." This is the typical requirement for Delivered Audio Quality in modern public safety radio systems. The mobile guarantee is for DAQ-4.0, defined by TSB-88 as "Speech easily understood. Occasional noise/distortion." A proposed Coverage Acceptance Text Plan (CATP), aligned with the above guarantees, can be found in **Attachment 15 - 3.1.14.2.D Sample Acceptance Test Plan** of this proposal.

Coverage Methodology

The coverage methodology employed by Motorola Solutions centers around its industry-leading Hydra Stratus predictive coverage tool. This is operated and aided by a large team of experienced coverage engineers and qualified subject matter experts who bring to bear knowledge in areas such as available antennas, regulatory constraints, design and optimization techniques, and best practices. Coverage designs undergo multiple levels of expert review before being proposed to a customer, and coverage commitments made by Motorola are highly vetted to ensure they will be borne out by the delivered system.

A description of the tool and process is provided below.

Hydra Overview

Hydra Stratus (Hydra) is an innovative software tool developed by Motorola Solutions, Inc. (Motorola Solutions) to accurately predict coverage, model traffic (voice and data), analyze interference, plan channel re–use, and perform other design tasks for our diverse portfolio of radio networks. This description concentrates on Hydra coverage planning aspects.

Hydra Detailed Description

Inputs to Hydra simulations include system architecture, equipment characteristics, service area boundaries, areas of various building losses, subscriber unit distribution density for traffic analysis, etc.

Hydra coverage map outputs are created and displayed using ESRI shapefiles, an industry–standard GIS file format. Shapefiles from many sources (GIS vendors, the Internet, a customer's GIS department, etc.) can be loaded, displayed, and used in Hydra to enhance mapping, and to define service area polygons. Hydra coverage analyses can be limited to specified service area polygons (e.g., a county, a city, or a dispatch territory), so coverage reliability can be analyzed exclusively within the boundaries of the operating area.

In addition to showing coverage reliability, Hydra maps can display terrain, land cover, roads and boundaries, signal strength and field strength, interference predictions, etc.

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Hydra provides closed–loop integration between predicting coverage and verifying coverage using Motorola Solutions' Voyager coverage acceptance testing tool. Field survey measurements—signal strength and Bit Error Rate (BER)—can be loaded into Hydra for analysis, display, and printing.

Tile Method

Hydra uniformly divides the entire geographical area to be analyzed into small, distinct areas called tiles. The resolution (size) of the tiles can be as fine as one arc–second (approximately 100 feet at U.S. latitudes). At each tile, Hydra models propagation from each site in the system.

The tile method is of particular importance in the calculation of simulcast coverage and interference analysis. Radial methods determine performance only at the locations where radials from all sites cross, leaving many areas where coverage performance is not calculated. With the tile method, the information from every site and all datasets is available in every tile; this provides the most accurate results for multi–site analyses (simulcast, voting, interference, best server, etc.).

Datasets

For propagation prediction, Hydra uses two (2) types of geophysical datasets:

Hypsographic (terrain elevations) to determine shadow loss and elevation.

Morphological (land use) for environmental clutter loss.

With the proper datasets, Hydra produces accurate results. Because propagation prediction accuracy is directly dependent on the quality of the digitized datasets, Motorola Solutions uses high–quality datasets for its analyses. These datasets generally originate from official government agencies such as the U.S. Geological Survey in the United States, and equivalent governmental organizations worldwide. When datasets are not available from these sources, Motorola Solutions can work with commercial GIS vendors to produce Hydra–compatible datasets.

Even the best datasets contain a certain amount of errors, caused by a number of factors that are difficult to completely overcome due to the massive amount of data involved. Some examples follow:

Source information—Older hypsographic and morphologic datasets were derived from existing map information, so any errors in the existing maps were carried over to the datasets. Newer datasets such as the U.S. National Land Cover Dataset (NLCD) are derived from satellite imagery, and are affected by digitization error.

Dataset development process—Potential error sources include limitations in the digitizing algorithms, computer hardware problems, and judgment calls by the dataset developer.

Dataset currency—Since the physical world is constantly changing, datasets can never be completely up-to-date. Over time, forests and shrub land are turned into farmland, hills are leveled, roads are built, communities are developed, and large buildings are constructed. Natural phenomena such as earthquakes, volcanoes, fires, storms, etc., change both the topography and environmental factors.

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Hydra, like all terrain–based propagation tools, provides coverage predictions that are only as accurate as the available datasets permit. In the U.S., Motorola Solutions uses high–quality terrain and land cover data derived from USGS 30–meter DEM and NLCD sources.

Other datasets which Hydra can use include the following:

- Planimetric (mapping)—Roads, water features, political boundaries, feature names, etc.
- U.S. radio site locations—Coordinates of existing radio sites, including FCC wireless licenses, FCC antenna site registry, and some commercial site providers.
- U.S. frequencies—Potentially available channels in geographic areas, per FCC wireless licenses.

Propagation Model

For each tile, Hydra predicts signal strength using a variation of the industry–accepted Okumura model, optimized by feedback from numerous deployed systems.

Hydra coverage maps indicate the probability (usually referred to as reliability) of the radio system providing a minimum acceptable criterion, such as a voice Delivered Audio Quality (DAQ) or a Bit Error Rate (BER). Since system coverage can never be 100% reliable, there will always be particular times and locations where the signal strength or BER does not meet that needed to reach the performance criterion. These locations of unsatisfactory performance are often predictable in a coverage study. However, there are also areas of unsatisfactory coverage that cannot be predicted due to unknown circumstances such as unusual structures, tree density, ambient noise, atmospheric conditions, dataset errors, and interference from co–channel or adjacent channel units operating outside their normal service area. Because these conditions exist and signals fade due to these environmental and terrain factors, coverage must be described statistically in terms of a percentage of locations that exhibit the minimum acceptable criterion.

Hydra predicts Area reliability, defined as the probability of achieving a specified performance criterion within a geographical area of interest. The area of interest is either the Covered Area (the painted area on a Hydra coverage map), or the entire Service Area. To provide radio systems with acceptably few communications failures throughout the Covered Area, Motorola Solutions designs coverage at high Area reliabilities. The performance criterion is usually DAQ for voice, or BER for digital voice, or both. It is also important to note that locations outside of a Hydra map coverage area may still provide useable communications, even though such locations do not achieve the minimum acceptable performance.

Voice Systems

Hydra coverage models use proven Okumura–based prediction methods and Monte Carlo simulation techniques to provide coverage reliability maps. Voice coverage models provide system–wide coverage maps, as well as subsystem maps (e.g., for simulcast cells and receiver voting), and individual site maps.

Simulcast Coverage Performance

For a simulcast system, merely providing coverage maps of individual sites (separately or on the same map) does not accurately represent the total system performance, which depends upon differential

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delays and aggregate signal levels. Therefore, Motorola Solutions has developed the Hydra simulcast model, which uses the delay spread methodology to simulate aggregate signal strength and audio phase angle (delay) throughout the entire predicted coverage area. All locations within the predicted coverage area are analyzed for the combined effect of signal strengths and differential delays from the simulcast transmitters in the system.

Hydra simulcast coverage maps will show any areas predicted to have coverage problems caused by out–of–phase signals and/or inadequate signal strengths. Hydra allows modeling with varied transmitter launch delays to predict optimized simulcast coverage within the area being evaluated. Hydra is continually updated for the latest technologies by Motorola Solutions' Resource Development Engineering team, to create the most accurate and up–to–date coverage and traffic prediction tool. It is used extensively in the design and testing phases of Motorola Solutions' radio networks. Hydra provides accurate, easy-to-read maps of the predicted coverage for your radio system.

Coverage Maps

Predictive coverage maps are shown on the pages that follow, and are summarized in the table below for quick reference:

No.	Map Name
Map 1	Portable Outdoor Inbound Coverage
Map 2	Portable Outdoor Outbound Coverage
Map 3	Portable in 15 dB Buildings Inbound Coverage
Map 4	Portable in 15 dB Buildings Outbound Coverage
Map 5	Portable in 20 dB Buildings Inbound Coverage
Map 6	Portable in 20 dB Buildings Outbound Coverage
Map 7	Mobile Mutual Aid Inbound Coverage
Map 8	Mobile Mutual Aid Outbound Coverage
Map 9	CATP Grid Map: City + 2 Miles
Map 10	CATP Grid Map: City + 1 Mile

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Section 2

RFP Section 3.4.15.5 Configuration Diagrams and Coverage Maps

Coverage maps are included in the following pages.

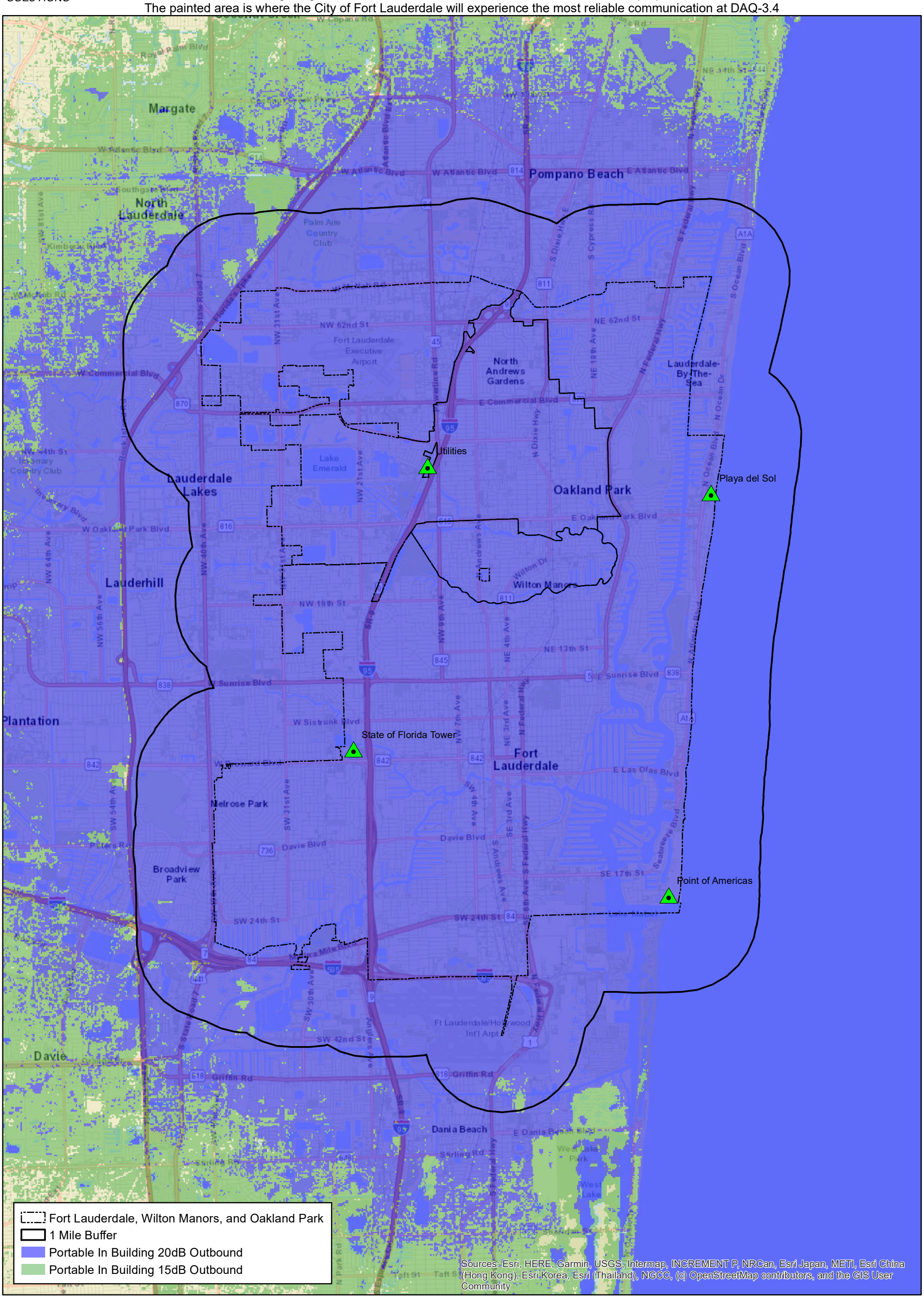
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City of Fort Lauderdale, FL

For Information Only

4-Site Astro P25 800 MHz TDMA Single-Cell Simulcast System
Coverage is guaranteed in accordance with the conditions stated in the proposal
The painted area is where the City of Fort Lauderdale will experience the most reliable communication at DAQ-3.4



0 0.45 0.9 1.35 Miles

1 in = 1 miles

Portable Configuration
APX N50, 3 W, 10cm 1/4 wave antenna (AN000418A01)
Tx/Rx at hip in swivel case w/ remote speaker mic

FL - Fort Lauderdale RFP
8003173200.1
Design 81
QBRN34, QBRN34-840G5

Jun 20, 2025
Hydra Stratus 3.2.5

This map is intended solely for the equipment configuration stated above.
Coverage can vary significantly if different configurations are used.

CAM #26-0710
Exhibit 4A
Page 800 of 980

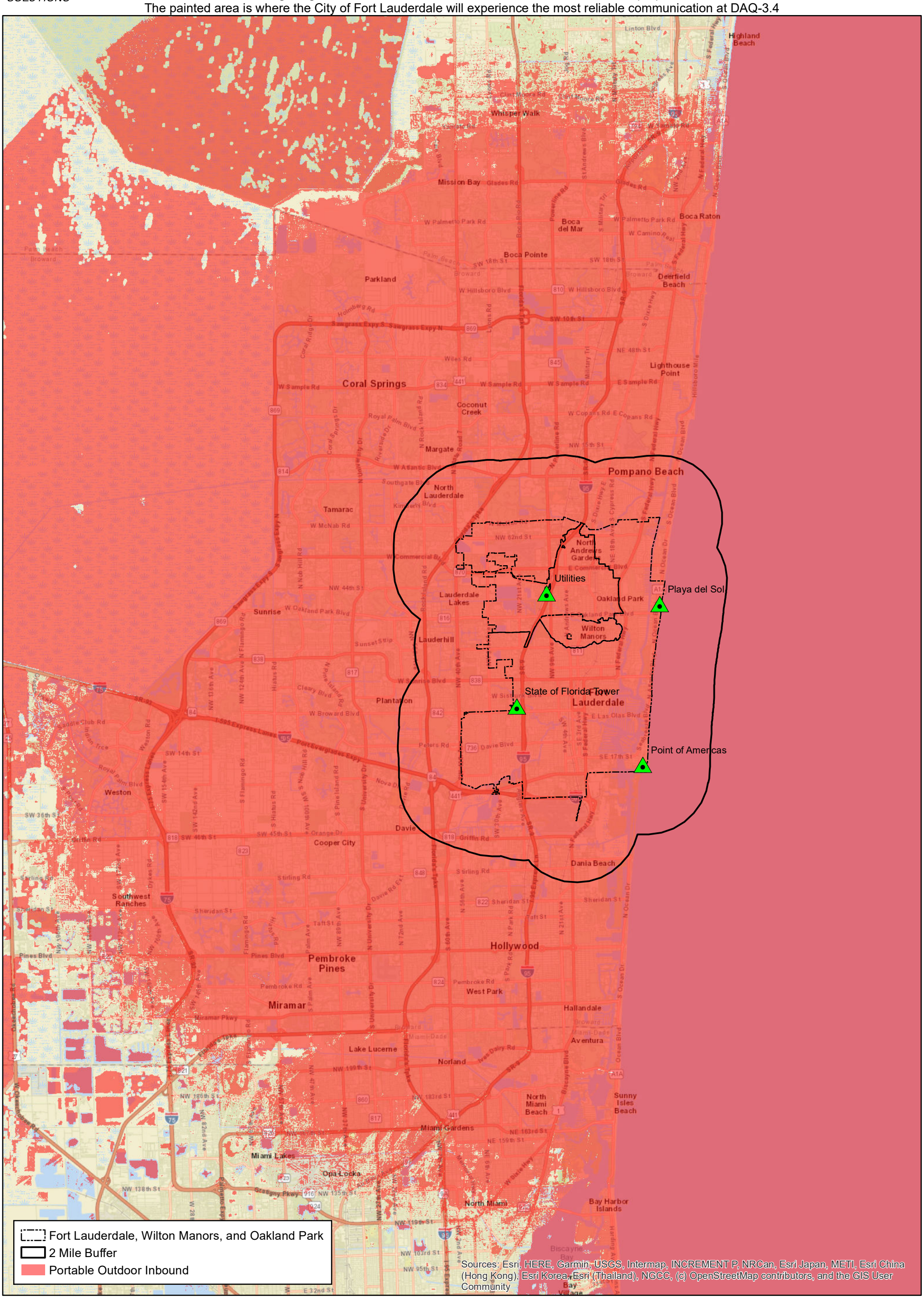
Map 11

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City of Fort Lauderdale, FL

For Information Only

4-Site Astro P25 800 MHz TDMA Single-Cell Simulcast System
Coverage is guaranteed in accordance with the conditions stated in the proposal
The painted area is where the City of Fort Lauderdale will experience the most reliable communication at DAQ-3.4



0 1 2 3 Miles
1 in = 2.5 miles

Portable Configuration
APX N50, 3 W, 10cm 1/4 wave antenna (AN000418A01)
Tx/Rx at hip in swivel case w/ remote speaker mic

FL - Fort Lauderdale RFP
8003173200.1
Design 81
QBRN34, QBRN34-840G5

Jun 20, 2025
Hydra Stratus 3.2.5

This map is intended solely for the equipment configuration stated above.
Coverage can vary significantly if different configurations are used.

CAM #26-0710
Exhibit 4A
Page 801 of 980

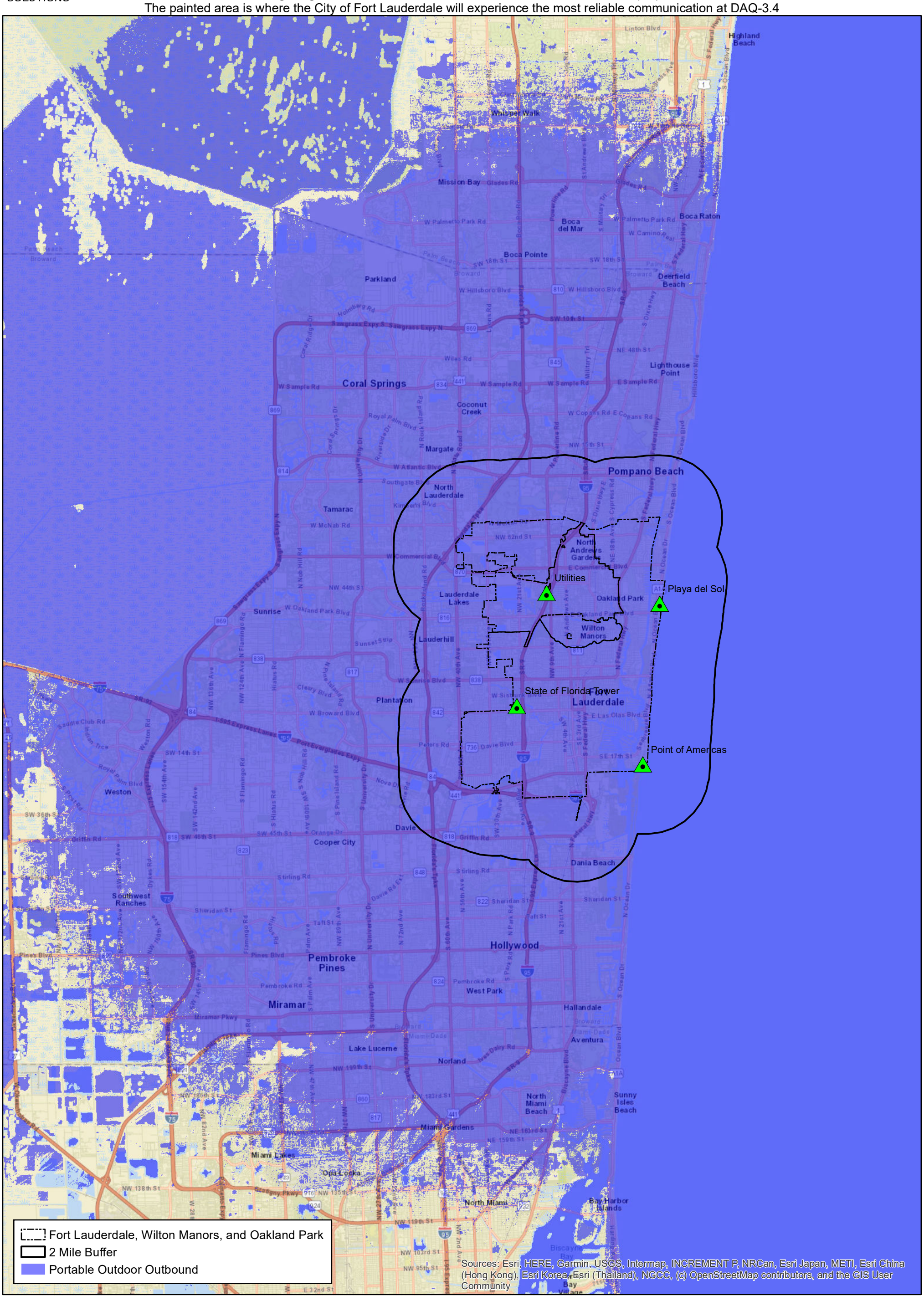
Map 01

MOTOROLA SOLUTIONS

City of Fort Lauderdale, FL

For Information Only

4-Site Astro P25 800 MHz TDMA Single-Cell Simulcast System
Coverage is guaranteed in accordance with the conditions stated in the proposal
The painted area is where the City of Fort Lauderdale will experience the most reliable communication at DAQ-3.4



0 1 2 3 Miles

1 in = 2.5 miles

Portable Configuration

APX N50, 3 W, 10cm 1/4 wave antenna (AN000418A01)
Tx/Rx at hip in swivel case w/ remote speaker mic

FL - Fort Lauderdale RFP
8003173200.1
Design 81
QBRN34, QBRN34-840G5

Jun 20, 2025
Hydra Stratus 3.2.5

This map is intended solely for the equipment configuration stated above.
Coverage can vary significantly if different configurations are used.

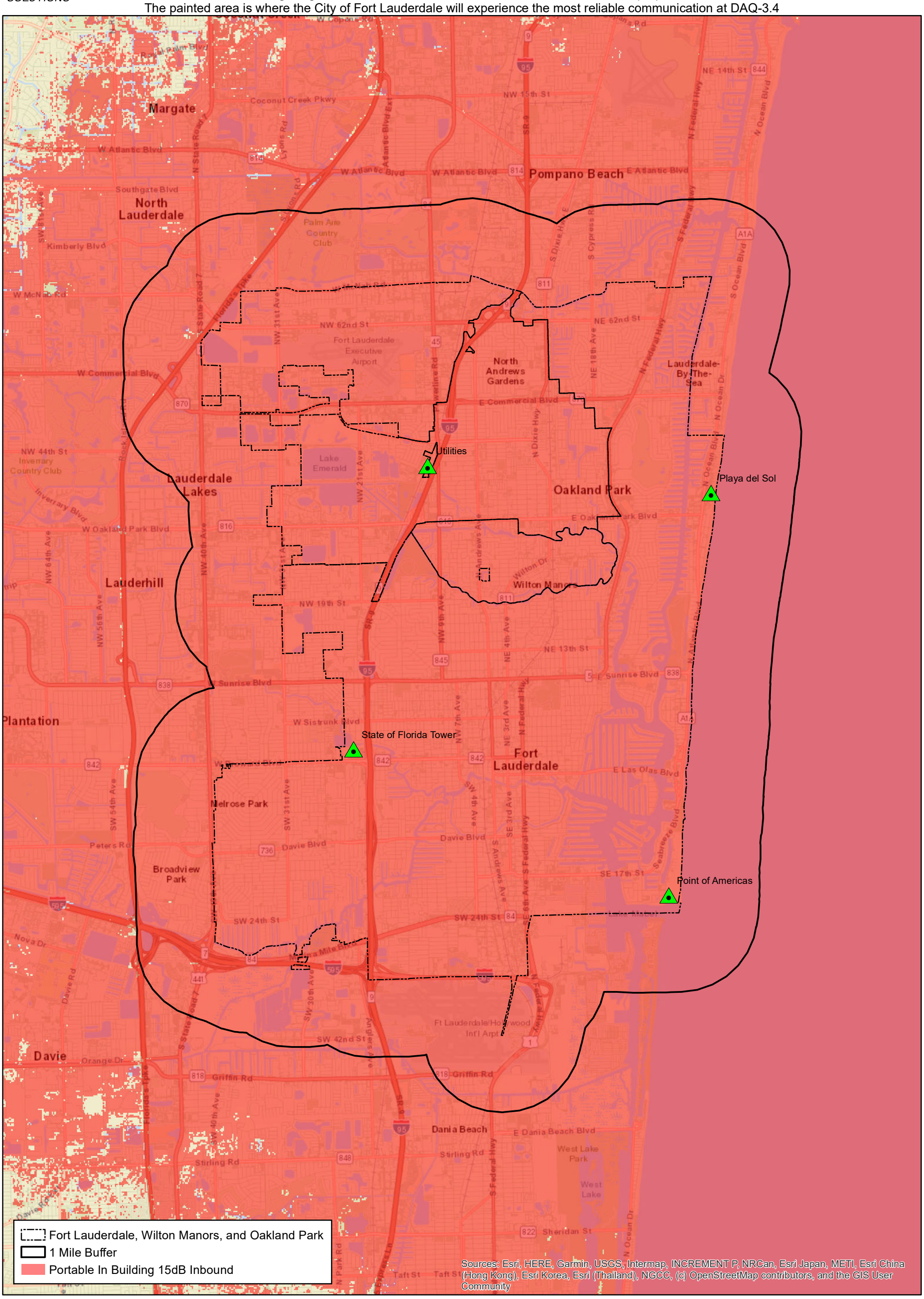
CAM #26-0715
Exhibit 4A
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Map 02

City of Fort Lauderdale, FL

For Information Only

4-Site Astro P25 800 MHz TDMA Single-Cell Simulcast System
Coverage is guaranteed in accordance with the conditions stated in the proposal
The painted area is where the City of Fort Lauderdale will experience the most reliable communication at DAQ-3.4



0 0.45 0.9 1.35 Miles

1 in = 1 miles

Portable Configuration

APX N50, 3 W, 10cm 1/4 wave antenna (AN000418A01)
Tx/Rx at hip in swivel case w/ remote speaker mic

FL - Fort Lauderdale RFP
8003173200.1
Design 81
QBRN34, QBRN34-840G5

Jun 20, 2025
Hydra Stratus 3.2.5

This map is intended solely for the equipment configuration stated above.
Coverage can vary significantly if different configurations are used.

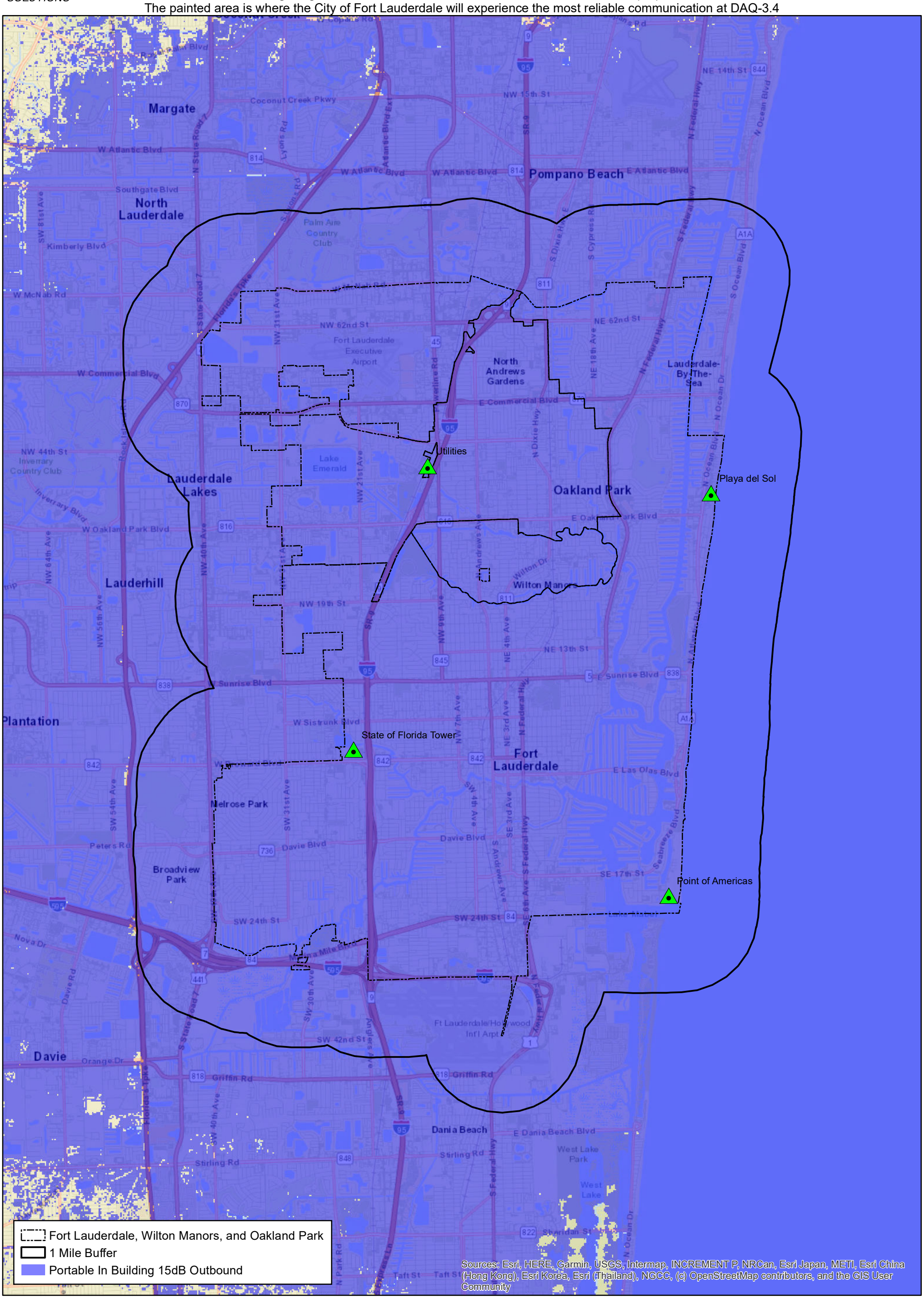
Map 03

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City of Fort Lauderdale, FL

For Information Only

4-Site Astro P25 800 MHz TDMA Single-Cell Simulcast System
Coverage is guaranteed in accordance with the conditions stated in the proposal
The painted area is where the City of Fort Lauderdale will experience the most reliable communication at DAQ-3.4



0 0.45 0.9 1.35 Miles

1 in = 1 miles

Portable Configuration

APX N50, 3 W, 10cm 1/4 wave antenna (AN000418A01)
Tx/Rx at hip in swivel case w/ remote speaker mic

FL - Fort Lauderdale RFP
8003173200.1
Design 81
QBRN34, QBRN34-840G5

Jun 20, 2025
Hydra Stratus 3.2.5

This map is intended solely for the equipment configuration stated above.
Coverage can vary significantly if different configurations are used.

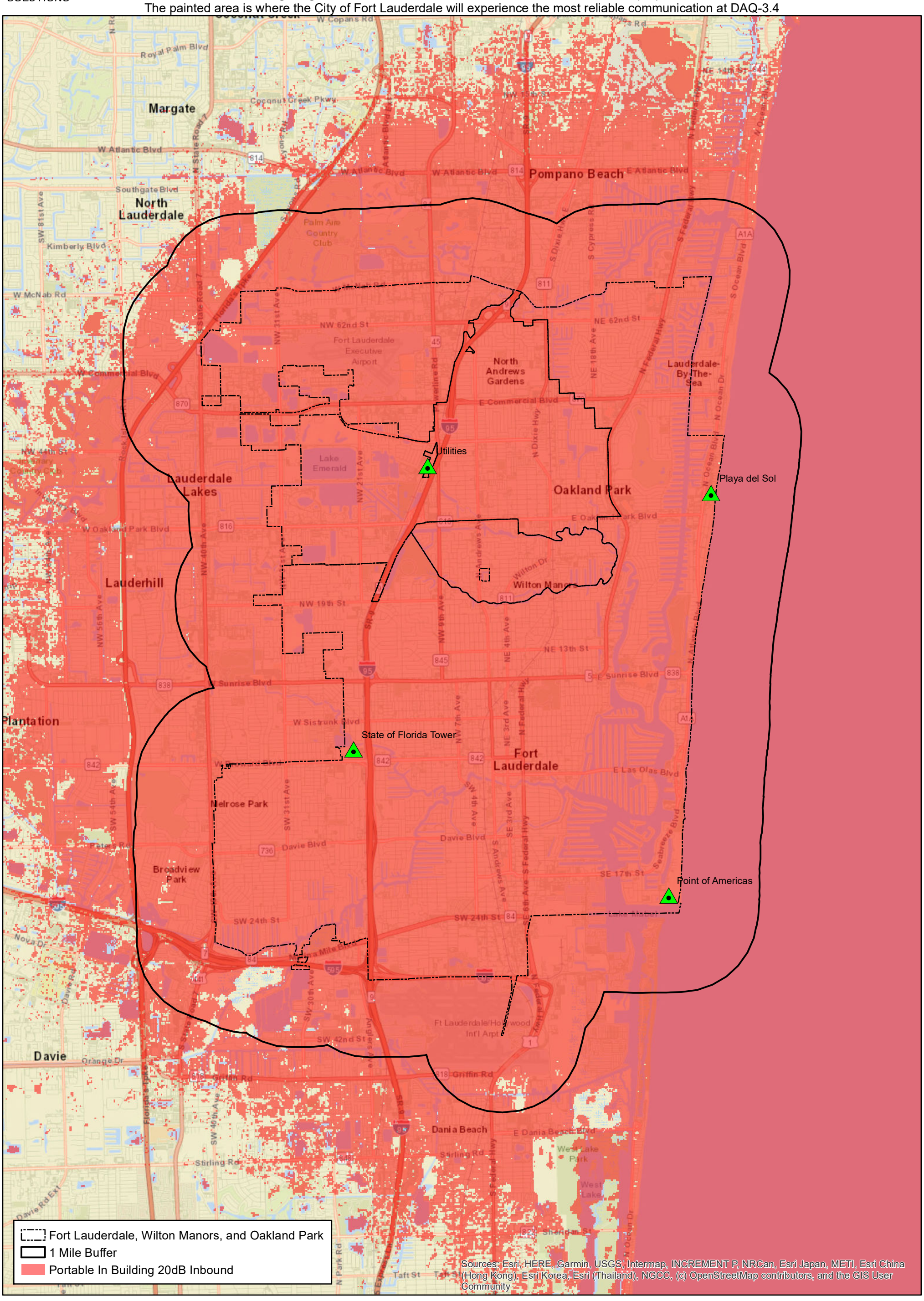
Map 04

MOTOROLA SOLUTIONS

City of Fort Lauderdale, FL

For Information Only

4-Site Astro P25 800 MHz TDMA Single-Cell Simulcast System
Coverage is guaranteed in accordance with the conditions stated in the proposal
The painted area is where the City of Fort Lauderdale will experience the most reliable communication at DAQ-3.4



0 0.45 0.9 1.35 Miles

1 in = 1 miles

Portable Configuration
APX N50, 3 W, 10cm 1/4 wave antenna (AN000418A01)
Tx/Rx at hip in swivel case w/ remote speaker mic

FL - Fort Lauderdale RFP
8003173200.1
Design 81
QBRN34, QBRN34-840G5

Jun 20, 2025
Hydra Stratus 3.2.5

This map is intended solely for the equipment configuration stated above.
Coverage can vary significantly if different configurations are used.

CAM #26-0710
Exhibit 4A
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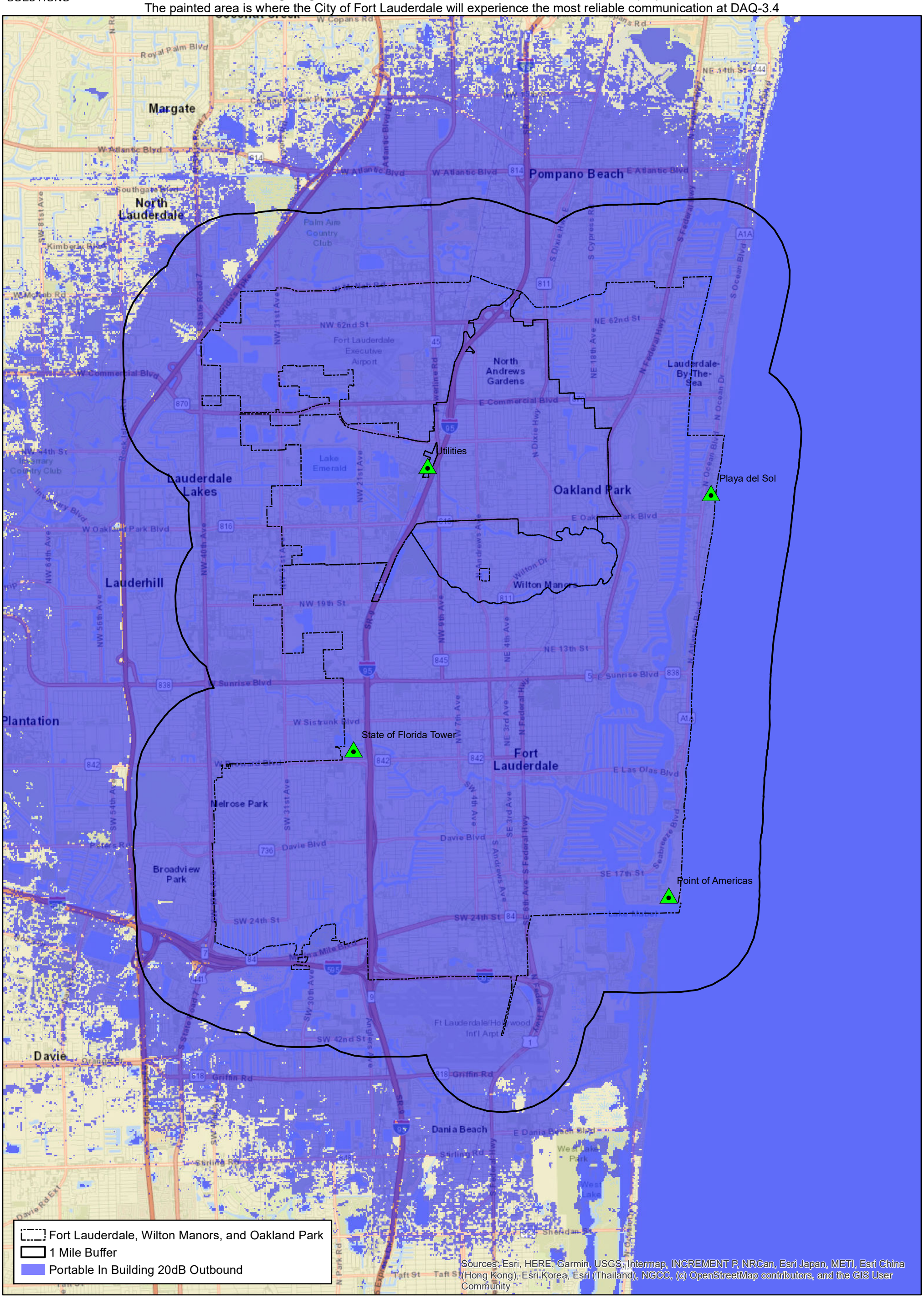
Map 05

MOTOROLA SOLUTIONS

City of Fort Lauderdale, FL

For Information Only

4-Site Astro P25 800 MHz TDMA Single-Cell Simulcast System
Coverage is guaranteed in accordance with the conditions stated in the proposal
The painted area is where the City of Fort Lauderdale will experience the most reliable communication at DAQ-3.4



0 0.45 0.9 1.35 Miles

1 in = 1 miles

Portable Configuration

APX N50, 3 W, 10cm 1/4 wave antenna (AN000418A01)
Tx/Rx at hip in swivel case w/ remote speaker mic

FL - Fort Lauderdale RFP
8003173200.1
Design 81
QBRN34, QBRN34-840G5

Jun 20, 2025
Hydra Stratus 3.2.5

This map is intended solely for the equipment configuration stated above.
Coverage can vary significantly if different configurations are used.

CAM #26-0715
Exhibit 4A
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Map 06

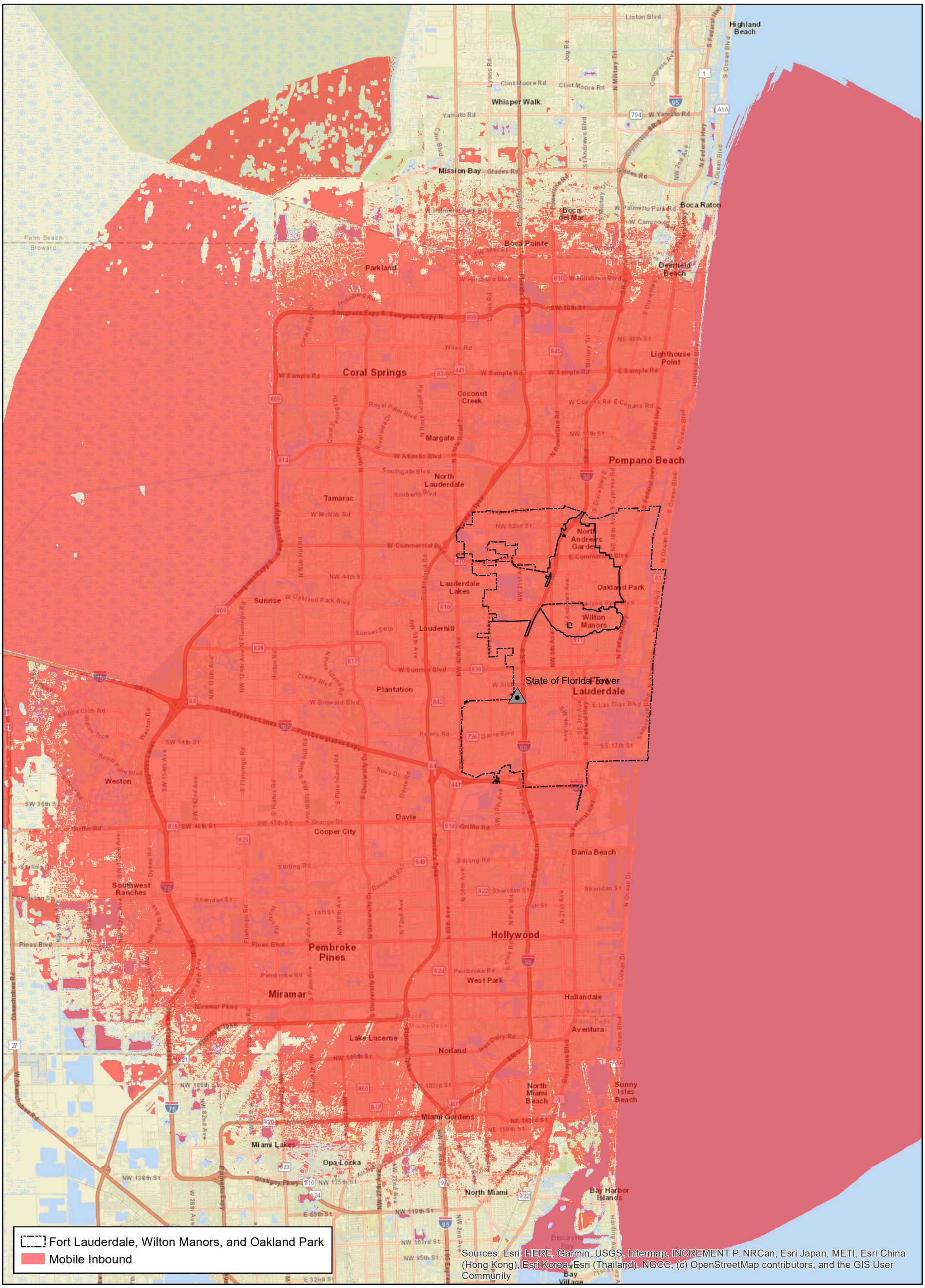
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City of Fort Lauderdale, FL

For Information Only

Single Site 800 MHz Analog Mutual Aid System

The painted area is where the City of Fort Lauderdale will experience the most reliable communication at DAQ-3.0



0 1 2 3 Miles

1 in = 2.5 miles

Mobile Configuration

APX 6500, 35 W, low profile HAF 4013

Tx/Rx at car trunk

FL - Fort Lauderdale RFP
9987749625.1
Design 5
QBRN34, QBRN34-840G5

Jun 20, 2025
Hydra Stratus 3.2.5

This map is intended solely for the equipment configuration stated above.
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Map 07

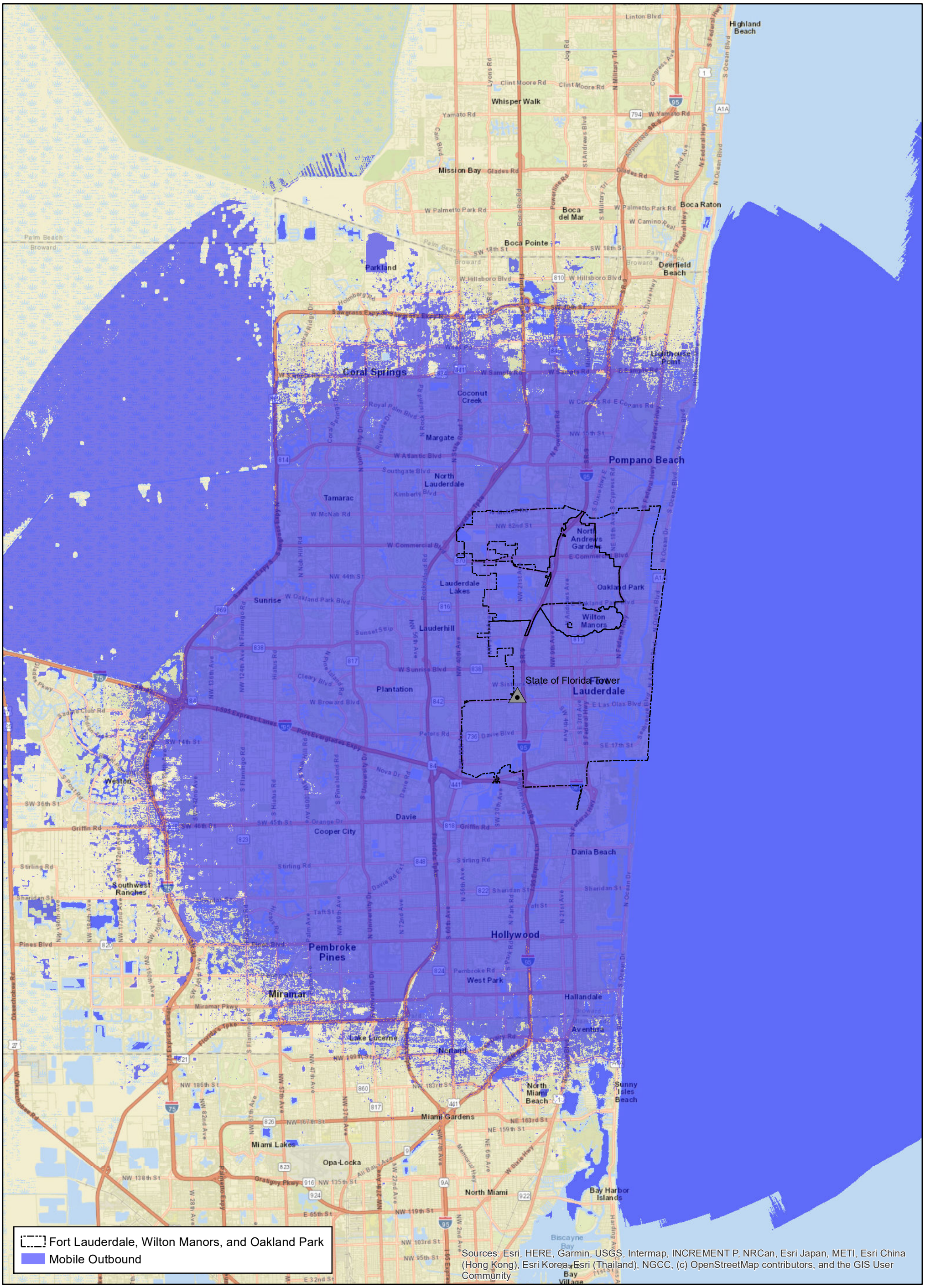
MOTOROLA SOLUTIONS

City of Fort Lauderdale, FL

For Information Only

Single Site 800 MHz Analog Mutual Aid System

The painted area is where the City of Fort Lauderdale will experience the most reliable communication at DAQ-3.0



0 1 2 3 Miles

1 in = 2.5 miles

Mobile Configuration
APX 6500, 35 W, low profile HAF 4013
Tx/Rx at car trunk

FL - Fort Lauderdale RFP
9987749625.1
Design 5
QBRN34, QBRN34-840G5

Jun 20, 2025
Hydra Stratus 3.2.5

This map is intended solely for the equipment configuration stated above.
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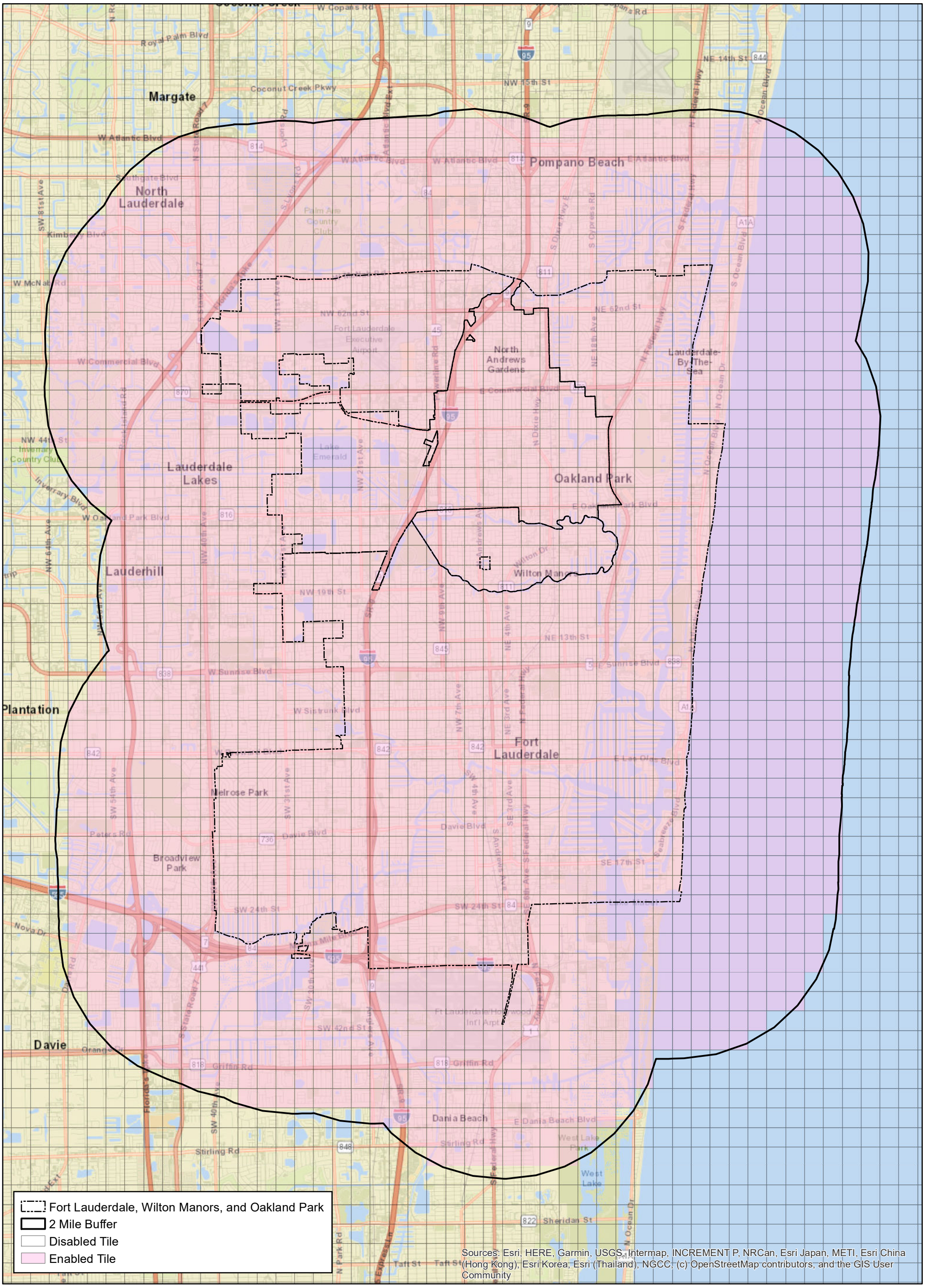
CAM #26-07
Exhibit 4A
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Map 08

MOTOROLA SOLUTIONS

City of Fort Lauderdale, FL

Cities + 2 Miles CATP Grid
1/4 Mile x 1/4 Mile Tiles



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

0 0.45 0.9 1.35 Miles

1 in = 1 miles

CATP Grid
Total Tiles: 1718
Estimated Accessible Tiles: 1637

FL - Fort Lauderdale RFP
6654354852.1
Design 4
QBRN34, QBRN34-840G5

Jun 20, 2025
Hydra Stratus 3.2.5

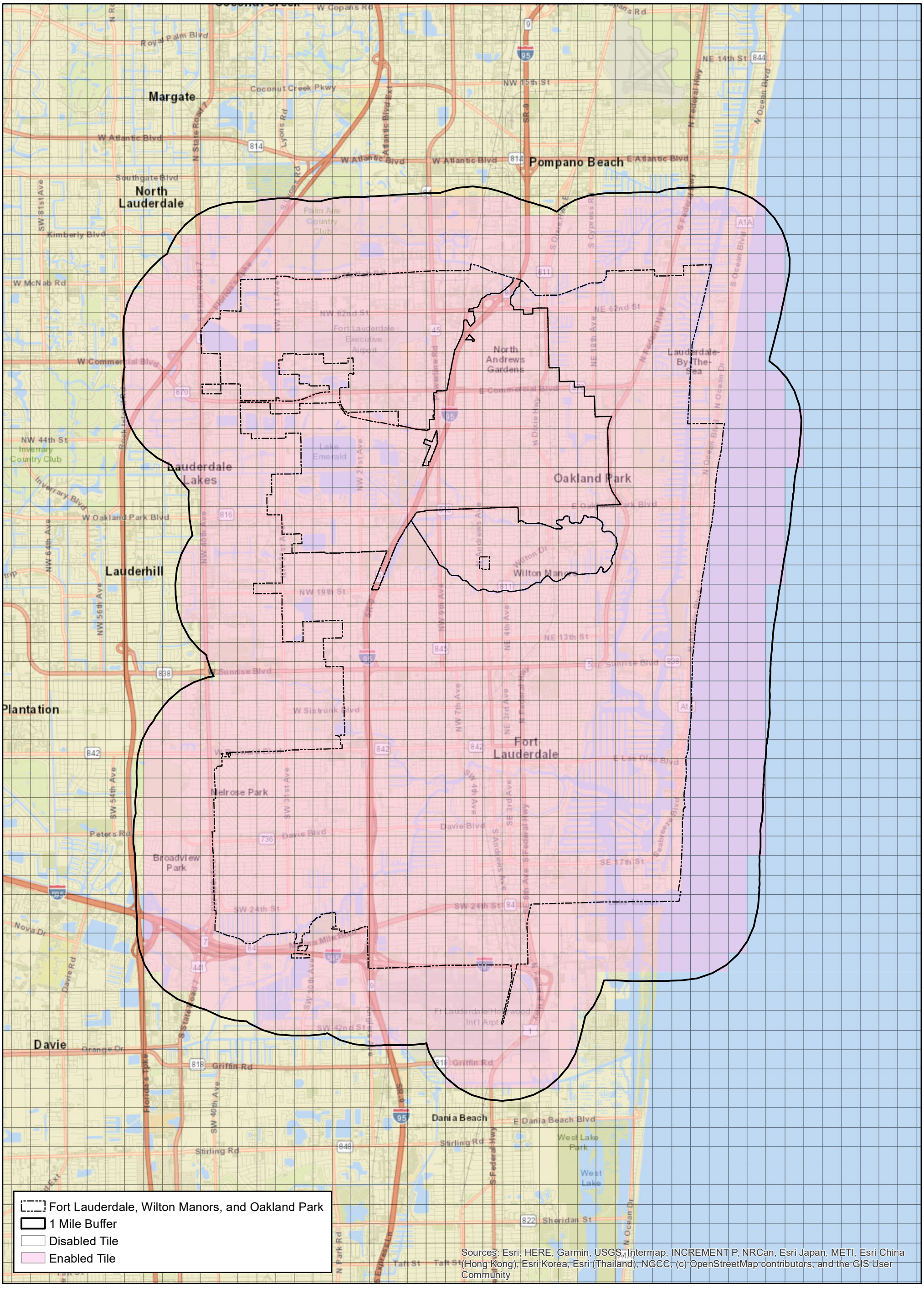
This map is intended solely for the equipment configuration stated above.
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Map 09

MOTOROLA SOLUTIONS

City of Fort Lauderdale, FL

Cities + 1 Miles CATP Grid
1/4 Mile x 1/4 Mile Tiles



0 0.45 0.9 1.35 Miles

1 in = 1 miles

CATP Grid
Total Tiles: 1264
Estimated Accessible Tiles: 1207

FL - Fort Lauderdale RFP
6303512982.1
Design 37
QBRN34, QBRN34-840G5

Jun 20, 2025
Hydra Stratus 3.2.5

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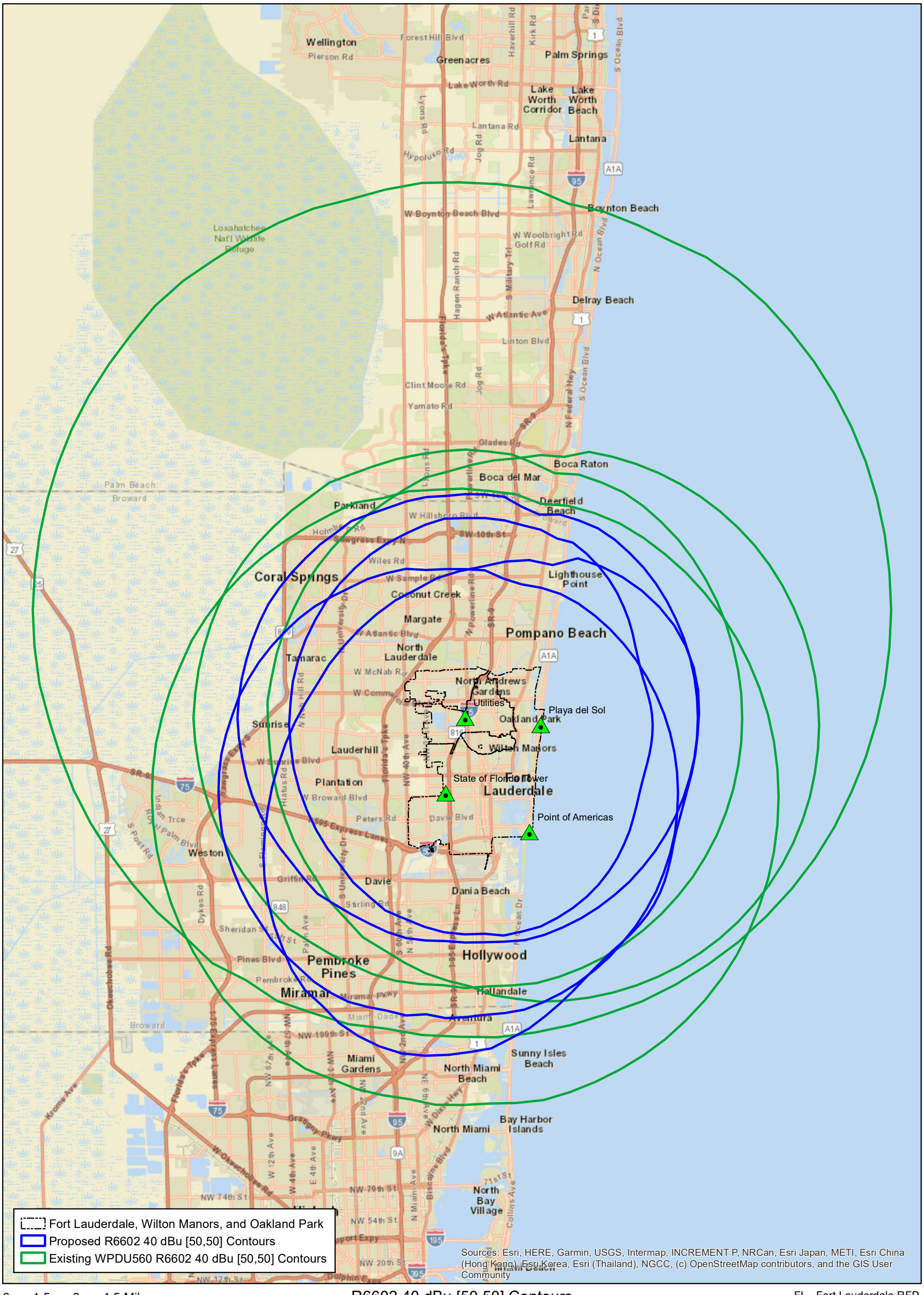
Map 10

MOTOROLA SOLUTIONS

City of Fort Lauderdale, FL

R6602 Contours
Existing WPDU560 Contours vs Proposed Contours

For Information Only



0 1.5 3 4.5 Miles

1 in = 3.75 miles

R6602 40 dBu [50,50] Contours

FL - Fort Lauderdale RFP
2255458842.1 and 8003173200.1
Design 77 and 81
QBRN34, QBRN34-840G5

Jun 24, 2025
Hydra Stratus 3.2.5

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Map 12

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City of Fort Lauderdale

Attachment 19 - P25 Repeater Specifications

RFP # 549

December 18, 2025

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Section 1

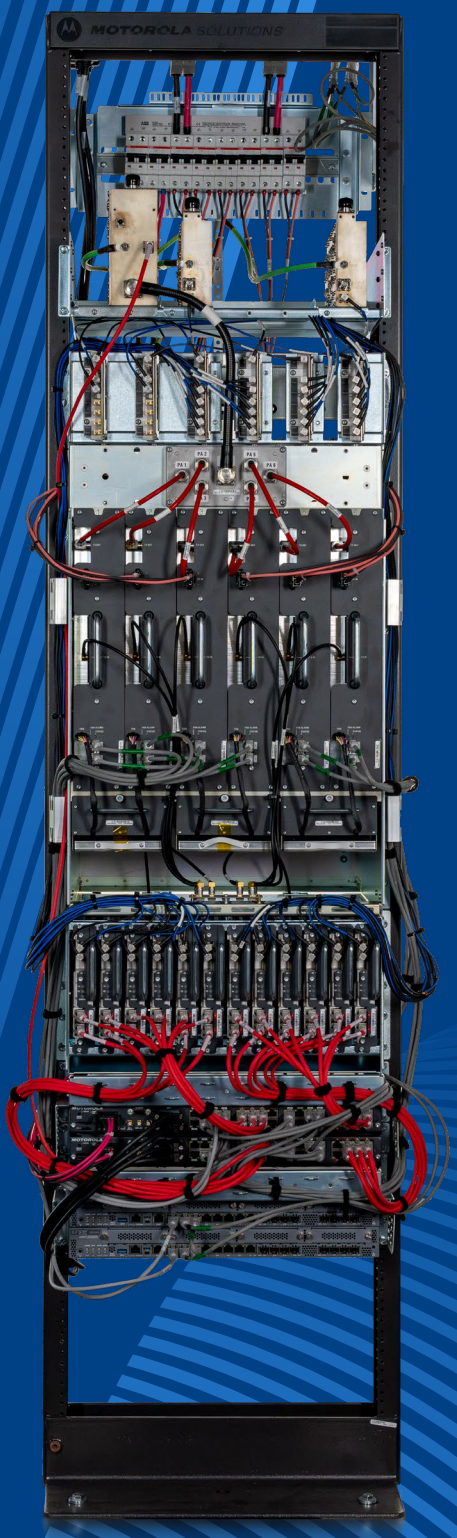
RFP Section 3.10.1.10 P25 Repeater Specifications

Information provided on the following pages.

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Data Sheet

ASTRO D-Series Multicarrier Radio Site



Improving uptime. Maximizing space. Easing ownership.

Public safety and critical infrastructure organizations rely on group collaboration for the safety of their personnel as well as the communities they serve. The ability to instantly communicate and connect with others over P25 radio systems gives them the information they need to quickly and safely respond to evolving events. We know that downtime is not an option for the sites and equipment that these users depend on every day. Motorola Solutions' ASTRO® radio sites are designed to continuously deliver reliable communication.

MOTOROLA SOLUTIONS

The D-Series Multicarrier Radio Site is a P25 radio site built with the dependability you'd expect in your critical communication system. With its unique use of redundancy, resource pools and software, the Multicarrier Site can dynamically allocate resources across available hardware to improve site resiliency and minimize downtime. Designed with a modern cybersecurity architecture and easy to deploy security patches, the Multicarrier Site can help protect your system from evolving threats.

We know that space is a premium in your facilities. That is why we built the M12 to support up to 12 carriers, or 24 TDMA P25 channels, in a single chassis. This includes the RF distribution, GPS timing references, power system and the backhaul equipment. To make the site easier to deploy and own, we've made it easier to find compatible frequencies while making it easier to keep the software up to date.

→ Key features

- APCO P25 compliant
- Modern hardware and software architectures
- Scalable to 12 carriers per rack/cabinet
- Multicarrier amplifier bank
- Superior processing power
- Integrated GNSS time and frequency reference
- N+1 redundant transceiver capable
- Integrated DC power (AC optional)

→ Available configurations

- Trunking repeater site
- Trunking simulcast subsite
- Single or mixed band rack/cabinet

→ Capacities

- 12 carriers per rack/cabinet (12 FDMA / 24 TDMA)
- 3 units per site, 30 carriers total
- Up to 30 carriers per Rx antenna
- Up to 12 carriers per Tx antenna



Improve uptime

Reduce downtime and outages

The D-Series Multicarrier Radio Site has a fault tolerant design with extensive redundancy to improve resilience and reduce downtime. The combination of redundant hardware and software, resource pools and dynamic resource allocation can minimize or eliminate the impact due to equipment failure.

Minimize space

Reduce footprint and site-related costs

The high channel capacity of the Multicarrier Site can reduce the space required in your facilities, saving site-development costs. Each chassis can support up to 12 carriers of mixed 700/800 MHz frequency bands. This can reduce the footprint needed for site equipment as well as reduce the requirements for other site systems such as power, cooling and more.

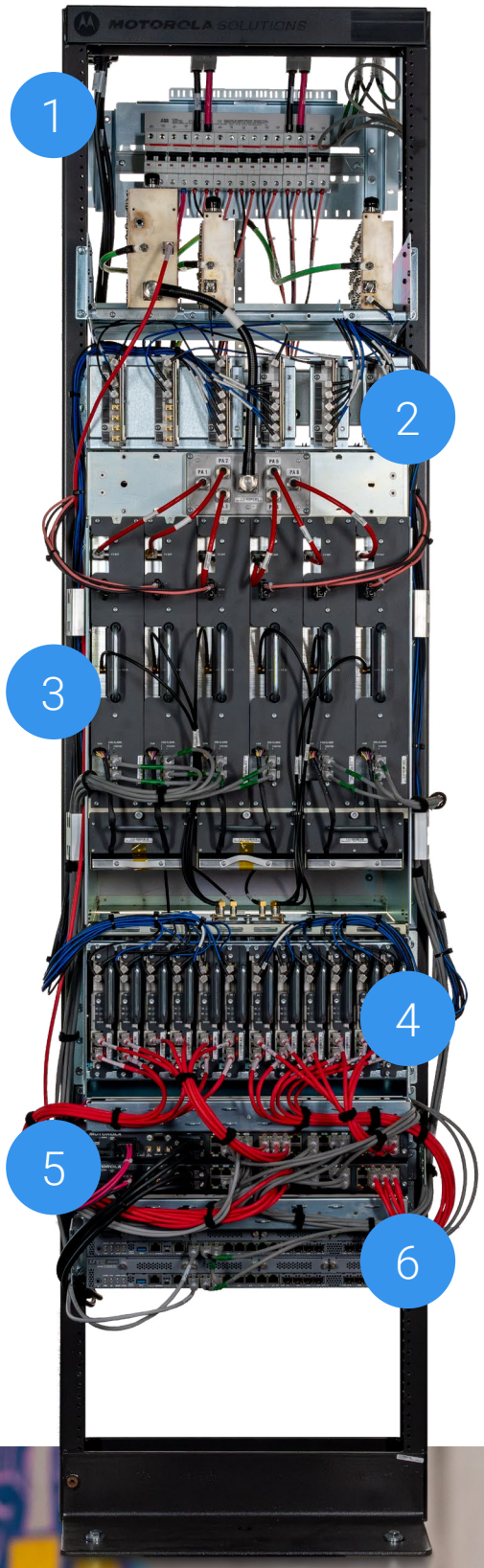
Ease ownership

Simplify deployment and operation

If your site is in a frequency congested area, the Multicarrier Site gives you access to almost 3X more frequency choices due to its tighter spacing capabilities, compared to traditional site equipment. With whole site software updates, the Multicarrier Site can make it easier to keep your equipment updated and secure.



CAM #26-0710
Exhibit 4A
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D-Series Multicarrier Site Rack Layout

1. Interface panels
   DC power, Tx and Rx antennas

2. RF distribution system
   Combiners, multicouplers and preselectors

3. Multicarrier amplifier bank (pooled redundancy)
   Pooled power amplifiers supporting all channels

4. Transceivers (N+1 redundancy)
   Up to 12 transceivers per rack/cabinet

5. Site processors (load-sharing redundancy)
   Site control and base radio software

6. Site routers (redundant units)
   With built-in firewalls



GENERAL SPECIFICATIONS (PER RACK OR CABINET)	
Number of Carriers	1 to 12
Dimensions (W x D x H)	Open rack: 20.5 x 23.5 x 84.25 in (520 x 600 x 2140 mm) Cabinet: 23.5 x 23.5 x 82.25 in (600 x 600 x 2090mm)
Weight (12 carriers)	Open rack: 498 lb (226 kg) Cabinet: 660 lb (300 kg)
Temperature Range	Operating: -22 to 140 °F (-30 to 60 °C) Non-operating: -40 to 185 °F (-40 to 85 °C)
Relative Humidity	15% to 90%, non-condensing
Power Requirements	AC: 90-264 VAC, 47-63 Hz, DC: 43.2-60 VDC
Power Consumption (12 carriers)	700 MHz: 5,000 Watts maximum 800 MHz: 4,700 Watts maximum
Antenna Connectors	Tx: 4.3-10 Female Rx: 4.3-10 Female
Channel Spacing	12.5 kHz / 25 kHz
Modulation	Tx: C4FM, LSM, H-DQPSK Rx: C4FM, H-CPM
Frequency Stability	Repeater site: 100 ppb/2yrs or GPS synchronized Simulcast (multisite): GPS synchronized

TRANSMIT SPECIFICATIONS (AT TOP OF RACK)	
Transmit Frequency Range	700 MHz: 768-776 MHz 800 MHz: 851-870 MHz
Transmit Carrier Spacing	50 kHz
Power Output[1]	2 - 50 Watts
	51 - 70 Watts (high-power configuration)
Modulation Fidelity	5%
Intermodulation Attenuation	80 dB
Spurious / Harmonic Emission Attenuation	75 / 90 dB
Emission Designators	8K70D1E, 8K70D1D, 8K70D1W, 8K10F1E, 8K10F1D, 8K10F1W, 9K80D7E, 9K80D7D, 9K80D7W

[1] Available at the top of rack. Max power may be reduced based on carrier count.

All specifications are subject to change without notice.

RECEIVE SPECIFICATIONS (AT TOP OF RACK)	
RECEIVER	
Receive Frequency Range	700 MHz: 798-806 MHz 800 MHz: 806-825 MHz
Digital Sensitivity (5% BER)	C4FM: -123.5 dBm H-CPM: -121.5 dBm
Receive Diversity	Available
Intermodulation Rejection	80 dB
Digital Adjacent Channel Rejection	60 dB
Spurious and Image Response Rejections	100 dB
Intermediate Frequency	First: 73.35 MHz Second: 2.16 MHz
RECEIVE RF DISTRIBUTION SYSTEM	
Noise Figure (typical/limit)	3 dB / 5 dB
Gain (typical/limit)	10 dB / -21 to 31 dB adjustable
3rd order Output Intercept (typical)	18 dBm
Amplifier Intercept	39 dBm



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Exhibit 4A
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REGULATORY DATA		
BAND	**US FCC ID**	**CANADA ISED ID**
800 MHZ	ABZ89FT5901 ABZ89FT5902	109AB-T5901 109AB-T5902
700 MHZ	ABZ89FT5911 ABZ89FT5912	109AB-T5911 109AB-T5912

To learn more, visit:
motorolasolutions.com/astro

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City of Fort Lauderdale

Attachment 20 - Dual Stiff Arms and Ruggedized Mounts

RFP # 549

December 18, 2025

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Motorola Solutions

Section 1

RFP Section 3.11.10 Fixed Microwave Equipment Requirements – Dual Stiff Arms and Ruggedized Mounts

VSTRUT-P3KIT



Inboard Side Strut Kit, 1.55m long, for 3 ft, 4 ft and 6 ft microwave antennas

Product Classification

Product Type	Strut kit

Dimensions

Mounting Pipe Length	1.551 m | 5.09 ft
Diameter, nominal	0.9 m | 3 ft | 1.2 m | 4 ft | 1.8 m | 6 ft

Material Specifications

Material Type	Galvanized steel

Mechanical Specifications

Aligning Function	Fixed

Packaging and Weights

Height, packed	48.26 mm | 1.9 in
Width, packed	48.26 mm | 1.9 in
Length, packed	1,699.26 mm | 66.9 in
Included	Bracket | Hardware | Strut
Volume	3,916,508.25 mm³ | 239 in³
Weight, gross	6 kg | 13.228 lb

Regulatory Compliance/Certifications

Agency	Classification
CHINA-ROHS	Below maximum concentration value
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
ROHS	Compliant
UK-ROHS	Compliant

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City of Fort Lauderdale

Attachment 21 - Microwave radio, Antenna and Related Equipment

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.12.2.1 Microwave Radio, Antenna, and Related Equipment

Motorola has provided equipment information in the following pages.

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Compact HE 2U power system

The Flatpack S 2U system is designed with customer flexibility in mind.

This small power dense system is purely based on pluggable breakers and rectifiers and can easily be configured to fit your required application, even in field. The combination of Flatpack S HE rectifier and Smartpack S controller ensures safe, reliable and environmental friendly operation. The shallow depth makes it suitable for most cabinets and excellent as a replacement unit. And as it is all based on the well proven Eltek technology, the Flatpack S family is the key for future needs.



Flatpack S 2U

(DC Power supply system 150A)

Doc MFGS0502. xxx.DS3 – rev3

APPLICATIONS

TELECOM – MOBILE / WIRELESS

- Radio Base stations/ Cell Sites
- LTE / 4G / WiMAX
- Distributed Antenna Systems
- Microwave
- Broadband

TELECOM – FIXED

- Telephony servers / switches
- Fiber Optics / FTTx
- Microwave
- Cable
- Broadband



Smartpack S controller



Flatpack S 48/1800 Rectifier

KEY FEATURES

- COMPLETE SYSTEM
- SMARTPACK S CONTROLLER
- HIGH EFFICIENCY RECTIFIERS
- BATTERY DISTRIBUTION
- LOAD DISTRIBUTION
- 270 MM SYSTEM DEPTH
- 2U HEIGHT
- HOT PLUGGABLE RECTIFIERS
- HOT PLUGGABLE CONTROLLER
- ADVANCED CONTROL AND MONITORING THROUGH ETHERNET PORT
- 4 LARGE BREAKER POSITIONS FOR BATTERY AND LOAD
- 10 X 30A MCB DISTRIBUTION
- PUSH-IN FRONT CONNECTION
- LVBD
- LVLD (OPTIONAL)

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Flatpack S 2U

Doc MFGS0502.xxx.DS3 – rev3

MODEL	2BB + 2LB	2BB + 2LB LVLD	4BB
Part number (Configured Telecom Power system)	CTOS0502.nnnn	CTOS0502.nnnn	CTOS0502.nnnn
INPUT DATA			
Voltage (range)	85 to 305 V_{AC} (45–66 Hz) / 85 to 250 V_{DC}		
Maximum current	21 A_{RMS}		
Mains configuration	3x single phase		
Connection	Rear connection on Faston connectors (6.3 mm)		
OUTPUT DATA			
Nominal voltage	-48 V_{DC}		
Maximum current CE	150 A_{DC}		
Maximum current UR (UL recognized)	100 A_{DC}		
BATTERY DISTRIBUTION			
LVBD	Default		
Plug-in Breakers (max rating)	2x 80 A	2x 80 A	4x 80 A
Connection	Rear connection on M6 Studs, 25 mm^2 max		
LOAD DISTRIBUTION			
LVLD (on Large Breakers)	n/a	Default	n/a
Plug-in Breakers Large (max rating)	2x 80 A	2x 80 A	n/a
Connection Large Breakers	Rear connection on M6 Studs, 25 mm^2 max		
Plug-in Breakers Small (max rating)	10 x 30 A [1)]		
Connection Small Plug-in Breakers	Front connection Push-in terminals, 6 mm^2 max		
CONTROL & MONITORING			
Smartpack S	6x Input / Output and Ethernet [2)]		
OTHER SPECIFICATIONS			
Dimensions (W / H / D)	19” / 2U / 270 mm (incl. rear terminal cover) [3)]		
Weight (w/o controller, rectifiers and breakers)	6.3 kg [13.88 lbs]		
Mounting	19” Flush mount		
Coding (prevents mixing of output voltages)	Coded for Flatpack S 48 V / 1000 W & 1800 W		
DESIGN STANDARDS			
Electrical safety	UL60950-1 / EN60950-1		
EMC	ETSI EN 300 386 v1.6.1 EN 61000-6-1 (immunity light industry) EN 61000-6-2 (immunity industry) EN 61000-6-3 + A1 (emission light industry) EN 61000-6-4 + A1 (emission industry)		
Environment	ETS 300 019-2-1 Class 1.2 ETS 300 019-2-2 Class 2.3 ETS 300 019-2-3 Class 3.2 Normal operating conditions as per IEC 62040-5-3:2016 clause 4.2. Other operating conditions as per IEC 62040-5-3:2016 clause 4.3, must be advised		

1) Each breaker branch (5 x B-frame breakers) rated for maximum 80 A in total
2) See Smartpack S datasheet
3) 30mm space in front and in back of the system is required for proper air flow

Specifications are subject to change without notice

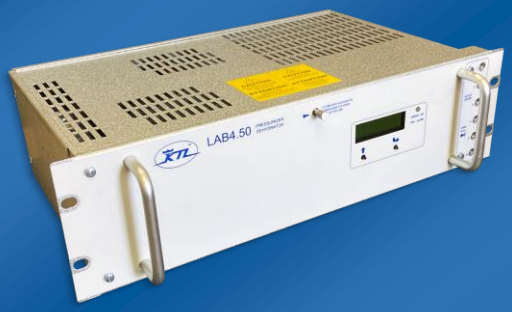
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LAB4.50 and LAB9.50 Automatic Dehydrators

For Air dielectric coaxial cable





Model	LAB4.50	LAB9.50
Maximum Flow Rate	254 SCFD (300 l/h)	678 SCFD (800 l/h)
Output pressure	Factory set at 3 PSI (programmable from 1.5 – 7 PSI)	Factory set at 4.5 PSI (programmable from 1.5 – 8.5 PSI)
Output Air Dew Point	Better than -40° F at 68° F (20° C) ambient temperature and 80% Relative Humidity	
Safety Valve	Factory set at 10 PSI +/-15%	Factory set at 10 PSI +/-10%
Dessicant Regeneration	Automatic by heating	
Regeneration Phase Interval	Adaptive according to plant leakages	
MTBF	Higher than 165,000 h, according to MIL HDBK 217F at Ground Base conditions, 77° F (25° C) ambient temperature, 50% flow rate	
Outlets	6 outlets, each with ON/OFF valve	8 outlets, each with ON/OFF valve
Outlets Fitting	3/8” (9.5 mm) diameter, others on request	3/8” (9.5 mm) diameter, others on request
Mounting	Wall and floor, 19” and ETSI N3 racks	Wall, 19” and ETSI N3 racks
Weight	20 lbs (9 kg)	35 lbs (14 kg)
Power Supply	AC - 110-240 V, 50/60 Hz, OR DC - 48/60 V	110-120 or 220-240 V, 50/60 Hz
Local Alarms	Low/high pressure; high humidity; system failures	
Remote Alarms	All alarms are remotely signaled by SPDT Relay	
Low Pressure Alarm	Factory set at 1.5 PSI; programmable from 0.5	
High Pressure Alarm	Factory set at 8.5 PSI; programmable up to 10 PSI	Factory set at 9 PSI; programmable up to 10 PSI
High Humidity Alarm	Set at 10% of relative humidity +/- 2%	
LED Indications	Power on; Alarms	
Optional Remote Monitoring	Web browser and SNMP;	
Standard Measures	Air pressure; hour meter (OPTION: air flow by digital flow meter)	

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PHONE: +1 423 878-3141 **e-mail:** KTL@kintronic.com **website:** www.kintronic.com

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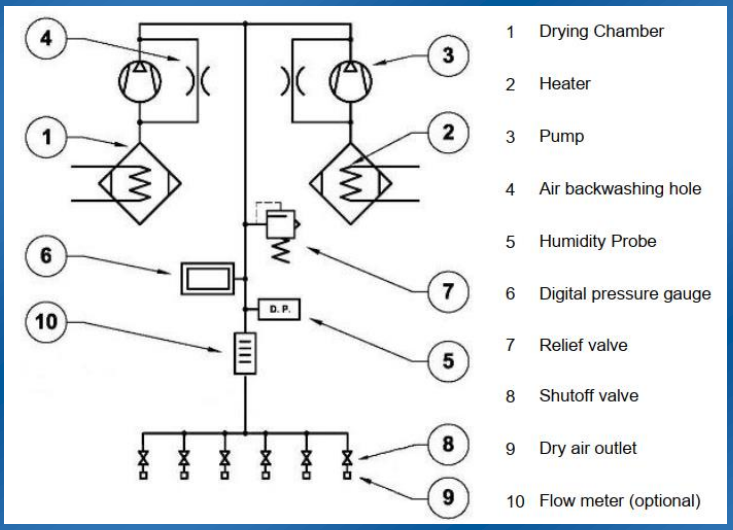
Description and Features

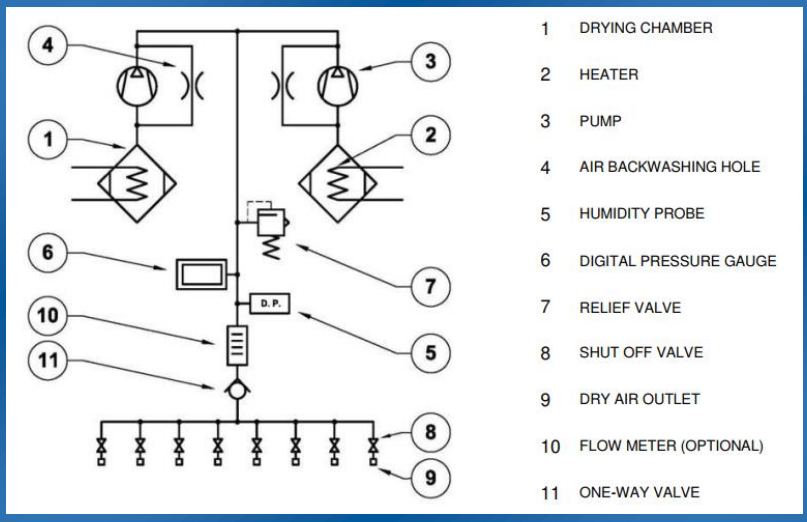
The LAB series dehydrators are programmed to maintain a single target pressure level. The unit is comprised of two alternating diaphragm pumps that are driven to operate below their maximum flow rate. While the first chamber is active, the desiccant in the second chamber is regenerated through heating and back-washing with a small reverse dry air flow. The pumps are controlled electronically by Pulse Width Modulation (PWM), supplying a flow rate equivalent to the real time leakage rate. With the PWM control, there is an imperceptible vibration of the diaphragm pump. Maintaining the target pressure level eliminates the need for a pressure regulator, which means no pressure losses and an overall better response to flow regulation. Through this design, the dehydrator avoids the stress of continuously switching on at maximum speed and then switching off. Additionally, there are no mechanical parts in movement (except the diaphragm pumps) and no solenoid valves, thus reducing overall wear. The result is an increased MTBF and overall lifetime of the unit, as well as reduced noise and power consumption.

Optional Features:

- Remote control through SNMP protocol and HTTP interface by a 10/100 Mbit Ethernet interface
- Digital flowmeter that displays real-time leakage rate on front LCD display panel

Dimensions	LAB4.50	LAB9.50
Wall Mounting	W: 19.2” (487 mm) H: 5.2” (132 mm) D: 14.2” (360 mm)	W: 19” (482 mm) H: 12.2” (310 mm) D: 9” (230 mm)
19” rack mounting	H: 3U D: 10.2” (260 mm)	W: 19” (482 mm) H: 12.2“ (310 mm) D: 5.9” (150 mm)
ETSI – N3 mounting	H: 6U D: 10.2” (260 mm)	W: 21” (533 mm) H: 12.2” (310 mm) D: 5.9” (150 mm)





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PHONE: +1 423 878-3141 **e-mail:** KTL@kintronic.com **website:** www.kintronic.com

Nokia Wavence

Microwave packet transport for long-haul full-indoor I (ANSI)

The Nokia Wavence Ultra-Broadband Transceiver (UBT-I) provides high-capacity, low latency microwave transport for long-haul, full indoor applications.

Designed to support long-distance, high-capacity, mission-critical applications, the UBT-I units help build flexible, secure, scalable and highly reliable networks. The UBT-I units are integrated in the Nokia Network Services Platform for common management with the rest of the Wavence portfolio, enabling consistent operations across end-to-end packet microwave networks. Combined with the Wavence Microwave Service Switch (MSS), the UBT-I sets the standard for delivering fast, efficient wireless transmission links with flexible networking and simple operations.





UBT-I	
Applications	• Mobile backhauling, private network backbone and rural last mile connectivity • Full indoor configuration
Physical	• 4.06 in x 7.95 in x 11.14 in • (103 mm x 202 mm x 283 mm)
Rack dimension	• 17.1 in x 4.29 in x 10.2 in • (436 mm x 109 mm x 260 mm)
Interfaces	• 1/2.5/10 GE optical port
Radio	• 5.8, L6, U6, 7, 8, 10.5 and 11 GHz • L6, U6, 11 GHz HP version • Up to 1 Gb/s with packet compression • Channels: 5 MHz, 10 MHz, 25 MHz, 30 MHz, 40 MHz, 60 MHz, 80 MHz
Modulation	• 4 QAM to 4096 QAM
Weight	• 11.13lb (5.05 kg)
Power	• -40.5 to -57.6 V • Dedicated sub-9 connector • 180 to 200 W typical depending on configuration and power level

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Exhibit 4A
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NOKIA

Technical specifications

Connections

- Optical SFP or SFP cables
- Direct power connection to PDU

Radio

- Two versions for UBT-I:
  - Standard unit with transmit and receiver
  - Optional unit with diversity receiver and digital combiner
- Two versions with different output power: UBT-I and UBT-I HP
- 1+0/1+1 HSB/SD
- N+0 Carrier Aggregation
- MPT-HLC + UBT-I Mixed Carrier Aggregation
- Optimized 2+0 Carrier aggregation
- Standalone (direct connection to router)

Mechanical

- Flexible RF filter configurations
  - Diplexers for compact & cost-effect solutions
  - Stacking filters to support FD and LAG
  - Adjacent Channel Co-Polar (ACCP) filters for maximum spectrum efficiency
- Each subrack occupies 2.5 RU in a standard 19–in. rack and holds up to 2 UBT-I/UBT-I HP
- Mix MPT-HLC and UBT-I in same subrack

Networking

- Ethernet interface: One optical SFP plug-in
- Advanced QoS: Support for IEEE 802.1p, Diffserv, TTL and strict priority
- Dynamic scheduling according to air interface changes
- VLAN: IEEE 802.1P, IEEE 802.1Q, Q-in-Q support
- ERPS: ITU-T G.8032
- Ethernet OAM (IEEE 802.1ag, ITU-T Y.1731 BNM, IEEE 802.3ah)

Environmental

- Operating temperature: 23°F to 131°F (-5°C to +55°C)
- Humidity: 0% to 95%, non-condensing

Standards compliance

Regulatory

- FCC Part 101
- ISED SRSP
- NTIA

Security

- AES 256 Encryption over Radio
- Strong Security Protocols (SFTP, HTTPS, SNMPv3)

Safety and environmental

- Telcordia GR-1089
- Telcordia GR-63
- IEEE 1613

Metro Ethernet Forum

- MEF 2.0, MEF 8, MEF 9, MEF 14, MEF 22

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Exhibit 4A
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Services

- Architecture and design
- Network planning
- Equipment and site engineering
- Installation services
- Integration services
- Performance analysis, network assessment, DCN, synchronization and QoS assessment
- Migration to packet microwave management
- Maintenance
  - 24x7 technical support
  - Return for repair or advanced exchange



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As a trusted partner for critical networks, we are committed to innovation and technology leadership across mobile, fixed and cloud networks. We create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs.

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CID210813

VHLP3-11W-6WH/A



0.9m | 3 ft ValuLine® High Performance Low Profile Antenna, single-polarized, 10.125–11.700 GHz, CPR90G flange, white antenna, composite broadband gray radome without flash, standard pack—one-piece reflector

Product Classification

Product Type	Microwave antenna
Product Brand	ValuLine®

General Specifications

Antenna Type	VHLP - ValuLine® High Performance Low Profile Antenna, single-polarized
Polarization	Single
Antenna Input	CPR90G
Antenna Color	White
Reflector Construction	One-piece reflector
Radome Color	Gray
Radome Material	Composite Broadband
Flash Included	No
Side Struts, Included	0
Side Struts, Optional	1 inboard

Dimensions

Diameter, nominal	0.9 m | 3 ft

Electrical Specifications

Operating Frequency Band	10.125 – 11.700 GHz
Gain, Low Band	37.8 dBi
Gain, Mid Band	38.4 dBi
Gain, Top Band	39 dBi
Boresite Cross Polarization Discrimination (XPD)	30 dB
Front-to-Back Ratio	64 dB
Beamwidth, Horizontal	2 °

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Revised: March 12, 2025

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VHLP3-11W-6WH/A

Beamwidth, Vertical	2 °
Return Loss	17.7 dB
VSWR	1.3
Radiation Pattern Envelope Reference (RPE)	7164A | 7166A
Electrical Compliance	Brazil Anatel Class 2 | Canada SRSP 310.5 | ETSI 302 217 Class 3 | US FCC Part 101A @ 10.55–10.7 GHz | US FCC Part 101A @ 10.7–11.7 GHz | US FCC Part 101B @ 10.125–11.7 GHz

Mechanical Specifications

Compatible Mounting Pipe Diameter	90 mm–120 mm | 3.5 in–4.7 in
Fine Azimuth Adjustment Range	±15°
Fine Elevation Adjustment Range	±15°
Wind Speed, operational	201 km/h | 124.896 mph
Wind Speed, survival	250 km/h | 155.343 mph

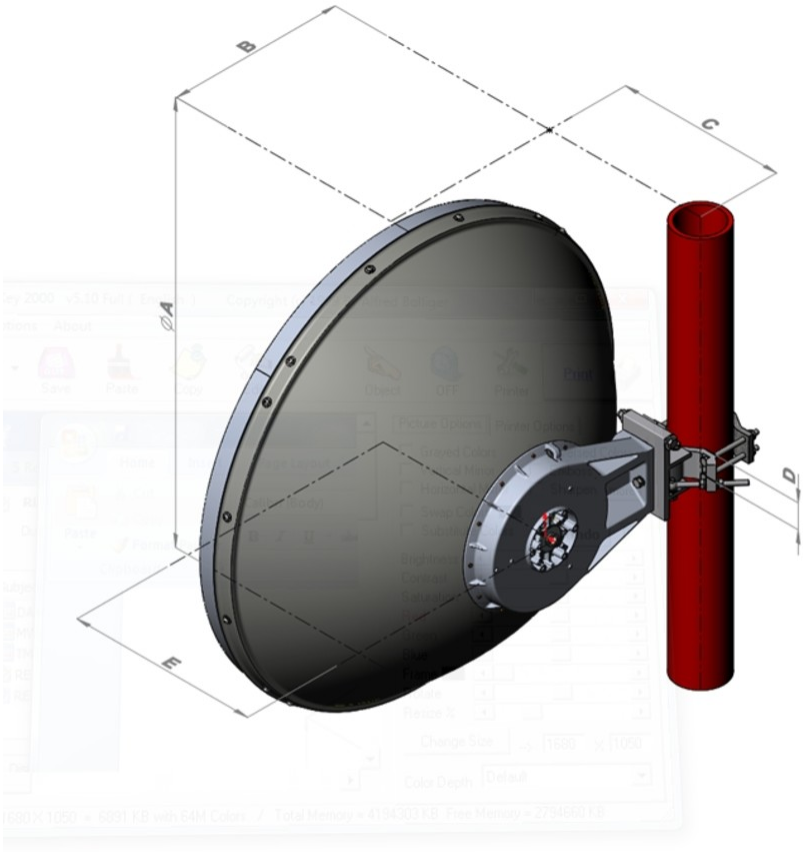
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VHLP3-11W-6WH/A

Antenna Dimensions and Mounting Information



Dimension in Inches (mm)					
Antenna size, ft (m)	A	B	C	D	E
3 (1.0)	39.3 (999)	16 (407)	15.2 (387)	2.4 (60)	17.2 (437)

Wind Forces at Wind Velocity Survival Rating

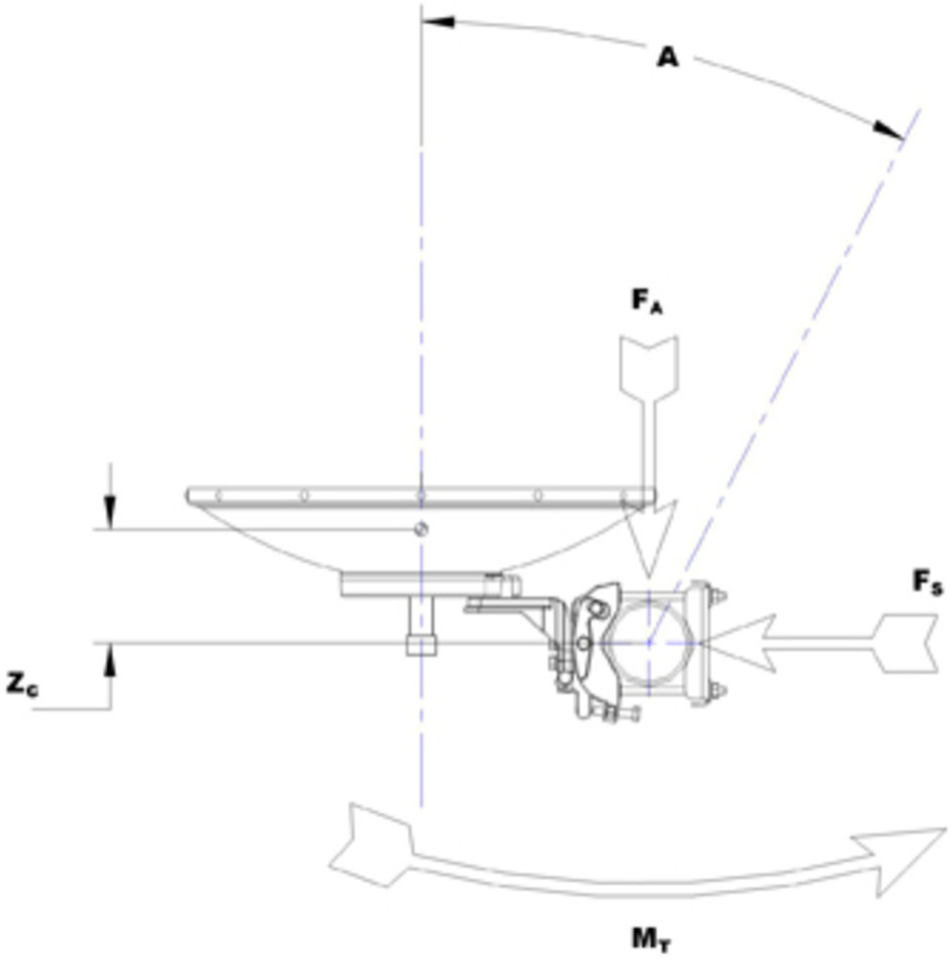
Axial Force (FA)	2903 N | 652.621 lbf
Angle α for MT Max	0 °
Side Force (FS)	1439 N | 323.5 lbf
Twisting Moment (MT)	1179 N-m | 10,435.029 in lb
Zcg without Ice	135 mm | 5.315 in
Zcg with 1/2 in (12 mm) Radial Ice	84 mm | 3.307 in
Weight with 1/2 in (12 mm) Radial Ice	46 kg | 101.413 lb

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Revised: March 12, 2025

CAM #26-0710
Exhibit 4A
Page 838 of 980

VHLP3-11W-6WH/A

Wind Forces at Wind Velocity Survival Rating Image



Packaging and Weights

Height, packed	1110 mm | 43.701 in
Width, packed	400 mm | 15.748 in
Length, packed	1200 mm | 47.244 in
Packaging Type	Standard pack
Volume	0.5 m³ | 17.657 ft³
Weight, gross	29 kg | 63.934 lb
Weight, net	17 kg | 37.479 lb

Regulatory Compliance/Certifications

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Revised: March 12, 2025

CAM #26-0710
Exhibit 4A
Page 839 of 980

VHLP3-11W-6WH/A

Agency	Classification
CHINA-ROHS	Below maximum concentration value
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
REACH-SVHC	Compliant as per SVHC revision on www.andrew.com/ProductCompliance
ROHS	Compliant
UK-ROHS	Compliant



* Footnotes

Operating Frequency Band	Bands correspond with CCIR recommendations or common allocations used throughout the world. Other ranges can be accommodated on special order.
Gain, Mid Band	For a given frequency band, gain is primarily a function of antenna size. The gain of Andrew antennas is determined by either gain by comparison or by computer integration of the measured antenna patterns.
Boresite Cross Polarization Discrimination (XPD)	The difference between the peak of the co-polarized main beam and the maximum cross-polarized signal over an angle twice the 3 dB beamwidth of the co-polarized main beam.
Front-to-Back Ratio	Denotes highest radiation relative to the main beam, at 180° ±40°, across the band. Production antennas do not exceed rated values by more than 2 dB unless stated otherwise.
Return Loss	The figure that indicates the proportion of radio waves incident upon the antenna that are rejected as a ratio of those that are accepted.
VSWR	Maximum; is the guaranteed Peak Voltage-Standing-Wave-Ratio within the operating band.
Radiation Pattern Envelope Reference (RPE)	Radiation patterns define an antenna's ability to discriminate against unwanted signals. Under still dry conditions, production antennas will not have any peak exceeding the current RPE by more than 3dB, maintaining an angular accuracy of +/-1° throughout
Wind Speed, operational	For VHLP(X), SHP(X), HX and USX antennas, the wind speed where the maximum antenna deflection is 0.3 x the 3 dB beam width of the antenna. For other antennas, it is defined as a deflection is equal to or less than 0.1 degrees.
Wind Speed, survival	The maximum wind speed the antenna, including mounts and radomes, where applicable, will withstand without permanent deformation. Realignment may be required. This wind speed is applicable to antenna with the specified amount of radial ice.

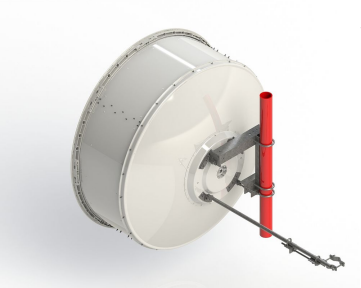
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VHLP3-11W-6WH/A

Axial Force (FA)	Maximum forces exerted on a supporting structure as a result of wind from the most critical direction for this parameter. The individual maximums specified may not occur simultaneously. All forces are referenced to the mounting pipe.
Side Force (FS)	Maximum side force exerted on the mounting pipe as a result of wind from the most critical direction for this parameter. The individual maximums specified may not occur simultaneously. All forces are referenced to the mounting pipe.
Twisting Moment (MT)	Maximum forces exerted on a supporting structure as a result of wind from the most critical direction for this parameter. The individual maximums specified may not occur simultaneously. All forces are referenced to the mounting pipe.
Packaging Type	Andrew standard packing is suitable for export. Antennas are shipped as standard in totally recyclable cardboard or wire-bound crates (dependent on product). For your convenience, Andrew offers heavy duty export packing options.

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Revised: March 12, 2025

VHLP6-6W/B



1.8 m | 6 ft ValuLine® High Performance Low Profile Antenna, single-polarized, 5.925–7.125 GHz

Product Classification

Product Type	Microwave antenna
Product Brand	ValuLine®

General Specifications

Antenna Type	VHLP - ValuLine® High Performance Low Profile Antenna, single-polarized
Polarization	Single
Side Struts, Included	1
Side Struts, Optional	1 inboard

Dimensions

Diameter, nominal	1.8 m | 6 ft

Electrical Specifications

Operating Frequency Band	5.925 – 7.125 GHz
Gain, Low Band	38.5 dBi
Gain, Mid Band	39.3 dBi
Gain, Top Band	40.1 dBi
Boresite Cross Polarization Discrimination (XPD)	30 dB
Front-to-Back Ratio	66 dB
Beamwidth, Horizontal	1.8 °
Beamwidth, Vertical	1.8 °
Return Loss	17.7 dB
VSWR	1.3
Radiation Pattern Envelope Reference (RPE)	7138B

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VHLP6-6W/B

Electrical Compliance	Brazil Anatel Class 3 | Canada SRSP 305.9 Part B | Canada SRSP 306.4 Part A | ETSI 302 217 Class 3 | US FCC Part 101A

Electrical Specifications, Band 2

Operating Frequency Band	5.700 – 5.875 GHz
Gain, Mid Band	38.3 dBi
Beamwidth, Horizontal	2.2 °
Beamwidth, Vertical	2.2 °

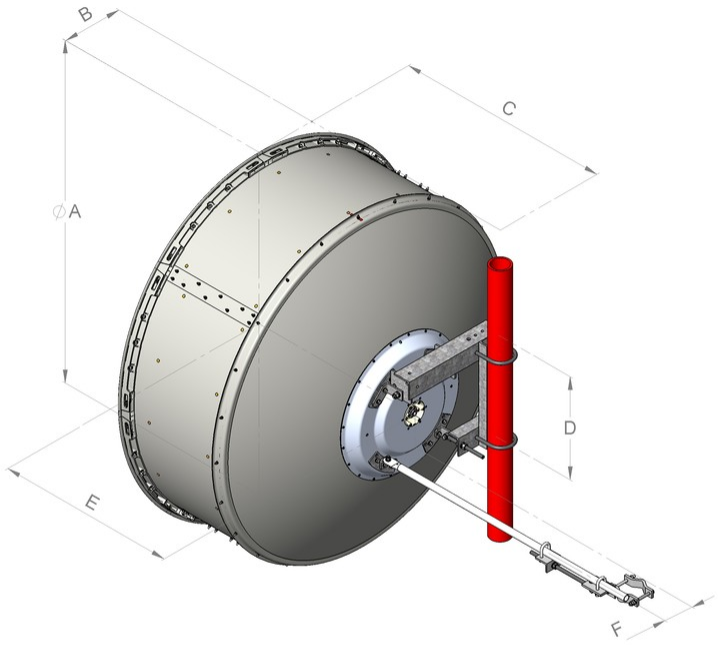
Mechanical Specifications

Compatible Mounting Pipe Diameter	115 mm–120 mm | 4.5 in–4.7 in
Fine Azimuth Adjustment Range	±15°
Fine Elevation Adjustment Range	±5°
Wind Speed, operational	201 km/h | 124.896 mph
Wind Speed, survival	250 km/h | 155.343 mph

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VHLP6-6W/B

Antenna Dimensions and Mounting Information



Dimensions in inches (mm)						
Antenna size, ft (m)	A	B	C	D	E	F
6 (1.8)	74.8 (1899)	13.4 (340)	47.5 (1206)	22.4 (570)	39.4 (1001)	6.9 (174)

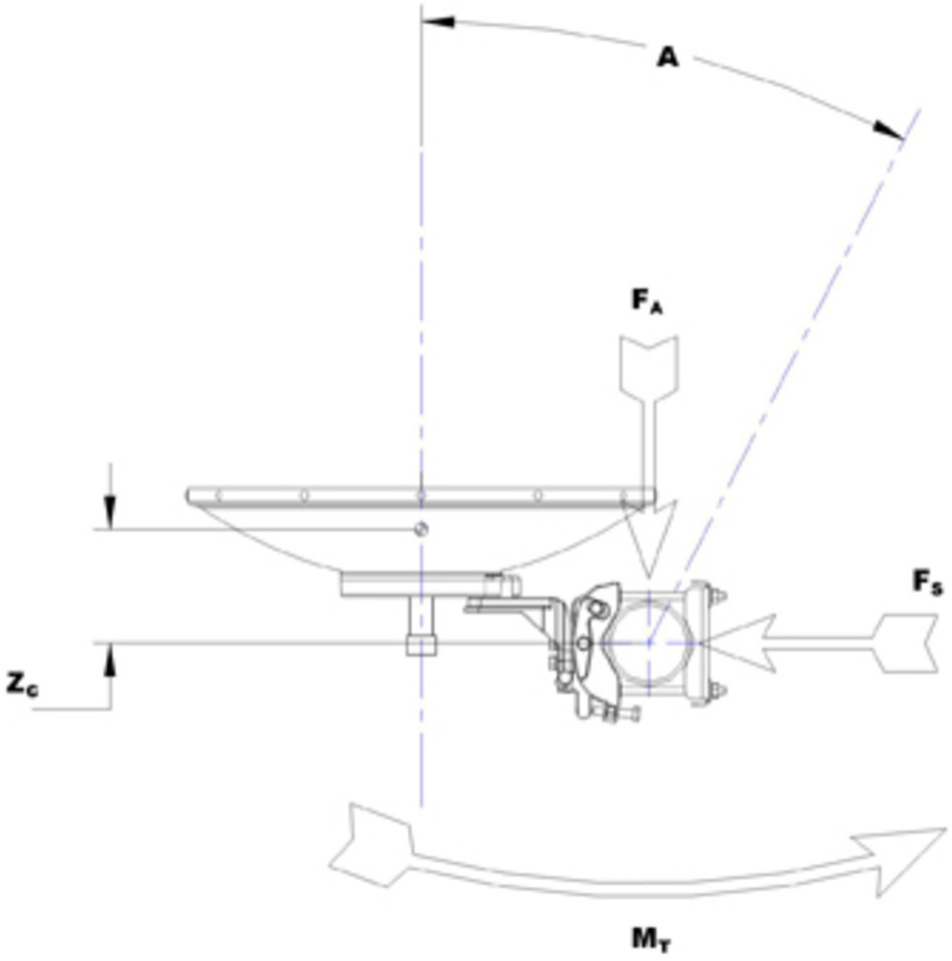
Wind Forces at Wind Velocity Survival Rating

Axial Force (FA)	10670 N | 2,398.712 lbf
Angle α for MT Max	-120 °
Side Force (FS)	5286 N | 1,188.34 lbf
Twisting Moment (MT)	4752 N-m | 42,058.742 in lb
Zcg without Ice	363 mm | 14.291 in
Zcg with 1/2 in (12 mm) Radial Ice	543 mm | 21.378 in
Weight with 1/2 in (12 mm) Radial Ice	234 kg | 515.881 lb

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VHLP6-6W/B

Wind Forces at Wind Velocity Survival Rating Image



Packaging and Weights

Weight, net	86 kg | 189.597 lb

Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system

* Footnotes

Operating Frequency Band	Bands correspond with CCIR recommendations or common allocations

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VoIP Orderwire



Deploy free voice communication at all your LAN sites across your network.

Benefits of Using VoIP Orderwire

- **Allows staff to communicate via LAN instead of leased telephone lines**
- **Hoot 'n Holler - Page all your staff at once within the orderwire system**
- **Build options: RTU capability with 16 discretes, 4 analogs, and 2-18 controls; +/-24VDC unit power; +12V sensor power**
- **Supports important legacy orderwire features**
- **Dialing on the handset - No need to stand right in front of your racks**
- **Slashes long-distance charges**
- **Avoid rolling out expensive POTS lines to distant sites**
- **Quick and easy to install**
- **Custom engineering available for compatibility with other manufacturers**
- **Rack-mountable - Just 1 RU**
- **Multiple power options available**

This next-gen orderwire product from DPS Telecom delivers voice communication at all your LAN sites. Using VoIP (Voice over IP) technology, you call another orderwire station, a select group of stations, or use the Hoot 'n Holler "all call" feature to page someone when you're not sure where they are.

Do your techs depend on their cell phones when working at distant sites? When cell coverage is poor, where will they turn in case of an emergency? Deploy this orderwire to achieve a reliable means of communication where you never had one before.

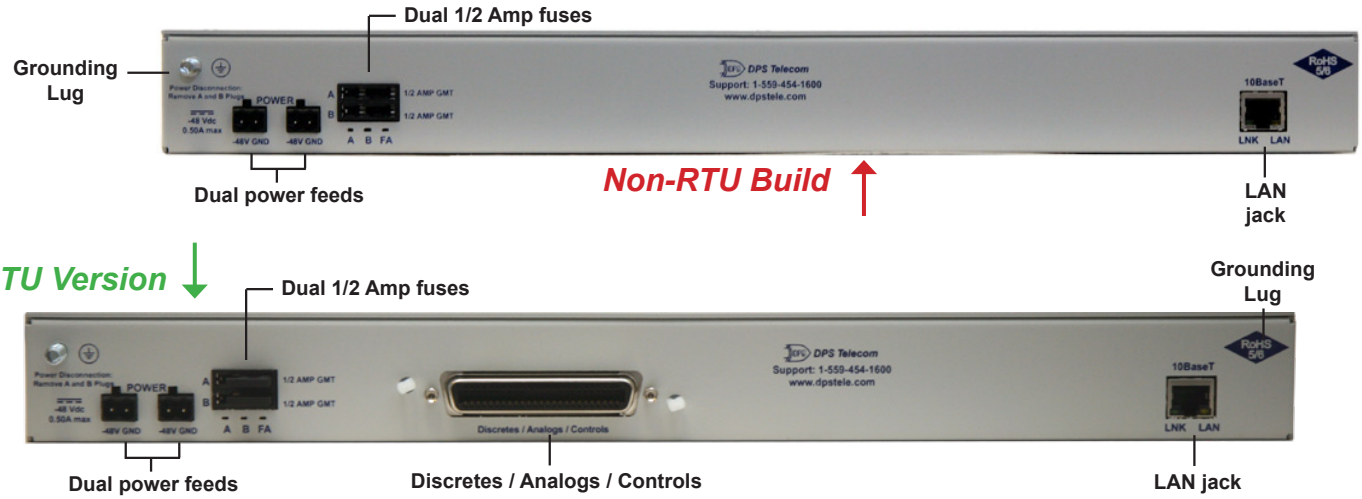
Plus, in the same 1 RU unit, you have the option of using RTU-functionality with 16 discrete alarm inputs, 4 analog inputs, and 2 to 18 control relays.

Each VoIP Orderwire station unit installs easily - just plug into your LAN hub. In just 1 RU of space, you can get rid of all those costly telephone lines and long-distance fees.

VoIP communication uses the industry-standard SIP 2.0 protocol and G.711 codec, making this orderwire system even easier to work with if you're already familiar with VoIP.

VoIP Orderwire from DPS Telecom currently runs on reliable DC power: -48VDC. Other power options include 10VAC via an optional wall transformer and +/-24VDC.

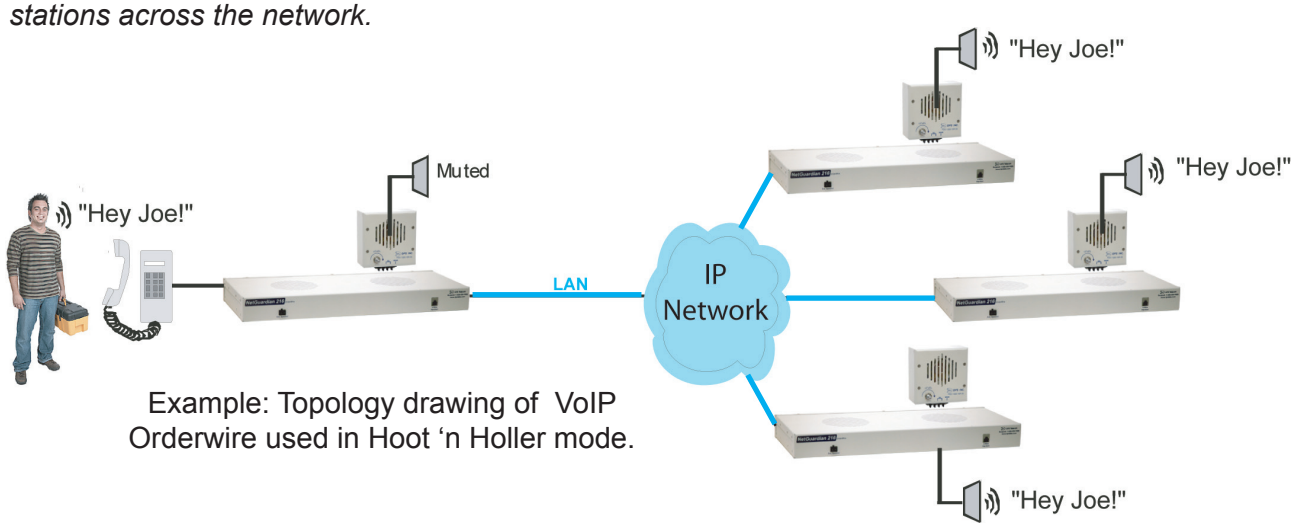
Back Panel View



VoIP Orderwire Functions

VoIP Orderwire offers different methods of VoIP communication with other stations across your network:

- ***Station to station -*** *Dial directly to another orderwire station, where it will "ring" until the party has answered. This call is considered private because other stations will not be able to hear the conversation.*
- ***Hoot 'n Holler -*** *This "all call" feature allows you to speak to every orderwire in the system. Personnel will hear your voice through the speaker at each station - Great if you're trying to locate someone or page all your staff.*
- ***Conference Bridging -*** *In this application, multiple stations join a private call where parties dial into a conference bridge to talk at the same time. This allows you to privately conference with orderwire stations across the network.*



Example: Topology drawing of VoIP Orderwire used in Hoot 'n Holler mode.

Specifications

- SIP 2.0 protocol - A standard VoIP protocol
- G.711 voice codec - A VoIP standard
- Dual -48VDC power feed, 10VAC via wall transformer, or +/-24 VDC
  (Call DPS for other power options)
- 2-wire handset included
- 1 - 10BaseT LAN port
- 1 DB9 craft port
- 1/2 amp fuse
- External speaker
- Available in multiple chassis colors
- Rack-mountable - 1 RU
- RTU version: 16 discretes, 4 analogs, 2-18 controls

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MOTOROLA SOLUTIONS

City of Fort Lauderdale

Attachment 22 - Path Profile Analysis

RFP # 549

December 18, 2025

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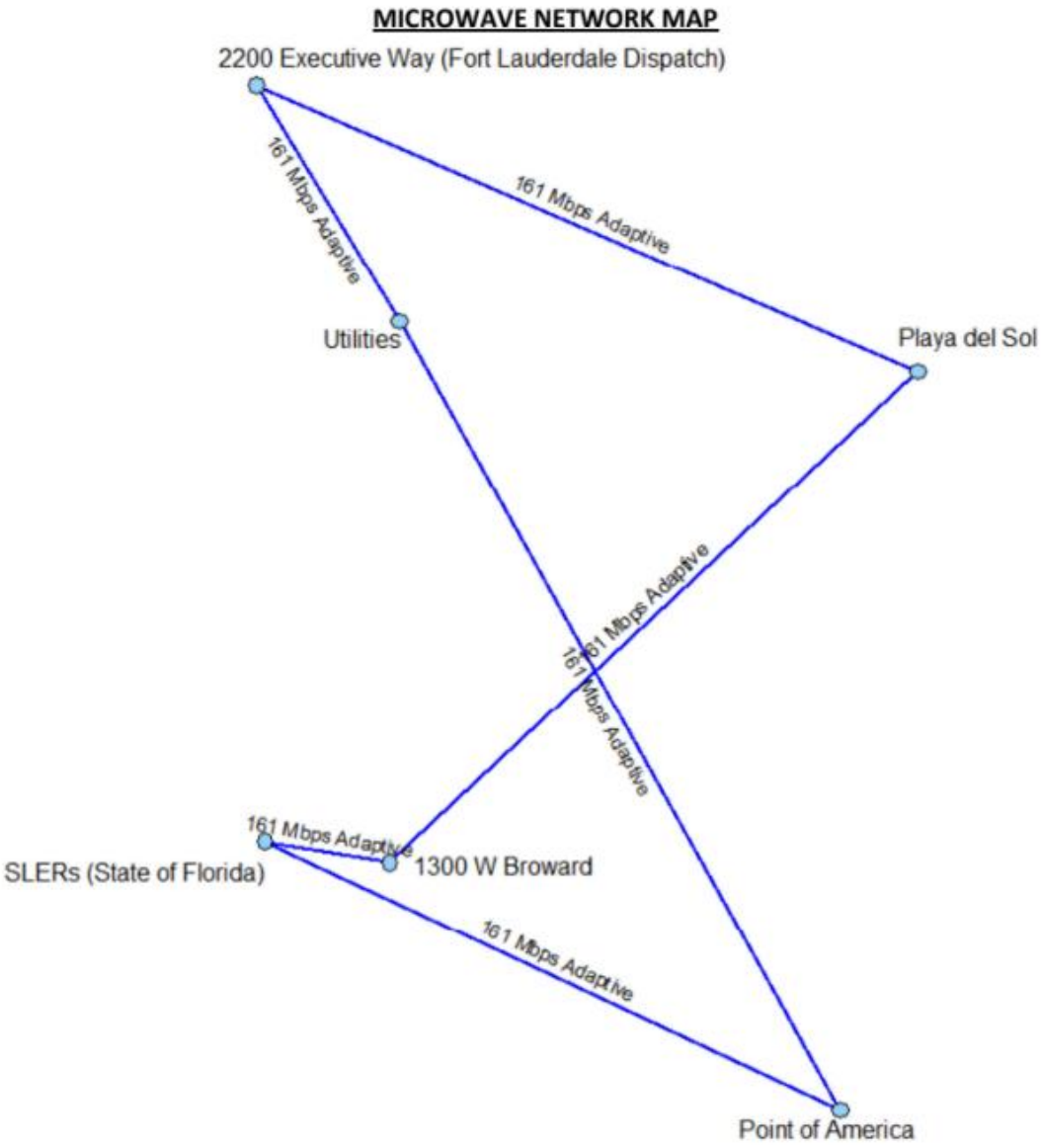
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Section 1

RFP Section 3.12.2.3 Path Profile Analysis

To meet this requirement, Motorola has provided a Microwave Feasibility Report in the following pages.

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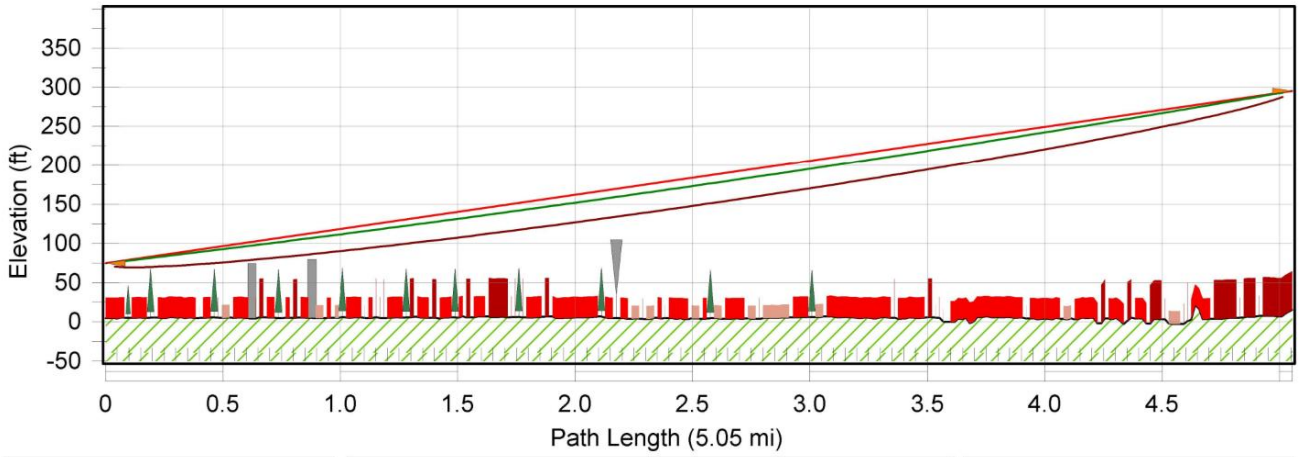


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Microwave Path Design Summary, Profiles, and Calculations

Site name S1	ASR S1	Latitude S1	Longitude S1	Tower Type S1	Elevation (ft) S1	Path Length (mi)	#1 Design frequency S1	#2 Design frequency S1	Polarization	Radio Model S1	Radio Configuration S1	TX Power (dBm) S1	TR TX Filter Loss (dB) S1	TR TX Switch Loss (dB) S1	TX Power at ACU Antenna Port (dBm) S1	RX Threshold Level (dBm) S1	Diffraction loss	Receive Signal (dBm) S1	Thermal Fade Margin (dB) S1	Annual multipath availability (%) S1	Annual rain + multipath availability (%)	Climatic factor	TR Antenna Model S1	TR Antenna Height (ft) S1	True Azimuth (°) S1	TR TX Line Model S1	TR TX Line Length (ft) S1	TR TX loss (dB) S1	TR RX loss (dB) S1	EIRP (dBm) S1
Point of America	1031418	26 05 47.60 N	080 06 26.00 W	4 Roof mount	13.82	6.32			Vertical	WVCE61-J0-128A30S-161	HSB (1:10) Diplexer Main	31	1.80	0.15	29.05	-70.1	0	-28.4	41.7	99.99981		3 VHLP6-6W	240	330.7	EW63	100	4.4	4.55	65.9
Utilities	1060231	26 10 35.60 N	080 09 25.10 W	1 Self Supporting	7.07	6.32			Vertical	WVCE61-J0-128A30S-161	HSB (1:10) Diplexer Main	31	1.80	0.15	29.05	-70.1	0	-28.4	41.7	99.99981		3 VHLP6-6W	110	150.68	EW63	140	4.98	5.13	65.32
Point of America	1031418	26 05 47.60 N	080 06 26.00 W	4 Roof mount	13.82	4.45			Vertical	WVCE61-J0-128A30S-161	HSB (1:10) Diplexer Main	28.5	1.80	0.15	26.55	-70.1	0	-28.11	41.99	99.99994		3 VHLP6-6W	240	294.9	EW63	100	4.4	4.55	63.4
SLERs (State of Florida)		26 07 25.60 N	080 10 20.00 W	1 Self Supporting	4.62	4.45			Vertical	WVCE61-J0-128A30S-161	HSB (1:10) Diplexer Main	28.5	1.80	0.15	26.55	-70.1	0	-28.11	41.99	99.99994		3 VHLP6-6W	130	114.87	EW63	160	5.27	5.42	62.53
2200 Executive Way (Fort Lauderdale Dispatch)		26 12 01.24 N	080 10 23.16 W	6 Monopole	13.09	1.94			Vertical	WVCE11-J1-128A30S-161	HSB (1:10) Diplexer Main	32.5	2.10	0.15	30.25	-69.6	0	-29.51	40.09	99.99999	99.99999	3 VHLP3-11W	50	148.54	EW90	80	5.7	5.65	65.2
Utilities	1060231	26 10 35.60 N	080 09 25.10 W	1 Self Supporting	7.07	1.94			Vertical	WVCE11-J1-128A30S-161	HSB (1:10) Diplexer Main	32.5	2.10	0.15	30.25	-69.6	0	-29.51	40.09	99.99999	99.99999	3 VHLP3-11W	180	328.55	EW90	210	9.68	9.63	61.22
Playa del Sol		26 10 17.50 N	080 05 54.50 W	4 Roof mount	15.12	5.06			Vertical	WVCE61-J0-128A30S-161	HSB (1:10) Diplexer Main	28	1.80	0.15	26.05	-70.1	0	-28.79	41.31	99.99989		3 VHLP6-6W	280	293.19	EW63	100	4.4	4.55	62.9
2200 Executive Way (Fort Lauderdale Dispatch)		26 12 01.24 N	080 10 23.16 W	6 Monopole	13.09	5.06			Vertical	WVCE61-J0-128A30S-161	HSB (1:10) Diplexer Main	28	1.80	0.15	26.05	-70.1	0	-28.79	41.31	99.99989		3 VHLP6-6W	65	113.15	EW63	95	4.33	4.48	62.97
1300 W Broward		26 07 17.90 N	080 09 29.22 W	4 Roof mount	4.61	0.89			Vertical	WVCE11-J1-128A30S-161	HSB (1:10) Diplexer Main	25	2.10	0.15	22.75	-69.6	0	-28.16	41.44	100	100	3 VHLP3-11W	60	279.54	EW90	50	4.78	4.73	58.62
SLERs (State of Florida)		26 07 25.60 N	080 10 20.00 W	1 Self Supporting	4.62	0.89			Vertical	WVCE11-J1-128A30S-161	HSB (1:10) Diplexer Main	25	2.10	0.15	22.75	-69.6	0	-28.16	41.44	100	100	3 VHLP3-11W	145	99.53	EW90	175	8.61	8.56	54.79
Playa del Sol		26 10 17.50 N	080 05 54.50 W	4 Roof mount	15.12	5.05			Vertical	WVCE61-J0-128A30S-161	HSB (1:10) Diplexer Main	30	1.80	0.15	28.05	-70.1	2.1	-28.23	41.87	99.99991		3 VHLP6-6W	280	227.19	EW63	100	4.4	4.55	64.9
1300 W Broward		26 07 17.90 N	080 09 29.22 W	4 Roof mount	4.61	5.05			Vertical	WVCE61-J0-128A30S-161	HSB (1:10) Diplexer Main	30	1.80	0.15	28.05	-70.1	2.1	-28.23	41.87	99.99991		3 VHLP6-6W	70	47.16	EW63	50	3.68	3.83	65.62

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1300 W Broward	
Latitude	26 07 17.90 N
Longitude	080 09 29.22 W
Azimuth	47.16°
Elevation	5 ft ASL
Antenna CL	70.0 ft AGL

Frequency (MHz) = 6100.0
Main 1 K = 1.330 %F1 = 100.00
Main 2 K = 0.400 %F1 = 0.00

Playa del Sol	
Latitude	26 10 17.50 N
Longitude	080 05 54.50 W
Azimuth	227.19°
Elevation	15 ft ASL
Antenna CL	280.0 ft AGL

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Transmission details (1300 W Broward-Playa del Sol.pl6)

	1300 W Broward	Playa del Sol
Latitude	26 07 17.90 N	26 10 17.50 N
Longitude	080 09 29.22 W	080 05 54.50 W
True Azimuth (°)	47.16	227.19
Vertical Angle (°)	0.45	-0.50
Elevation (ft)	4.61	15.12
Tower height (ft)	60.00	280.00
Tower Type	Roof mount	Roof mount
Antenna Model	VHLP6-6W (TR)	VHLP6-6W (TR)
Antenna Filename	vhlp6-6w	vhlp6-6w
Antenna Gain (dBi)	39.30	39.30
Antenna Height (ft)	70.00	280.00
TX Line Model	EW63	EW63
TX Line Unit Loss (dB/100 ft)	1.45	1.45
TX Line Length (ft)	50.00	100.00
TX Line Loss (dB)	0.73	1.45
Connector Loss (dB)	0.50	0.50
Extender Loss (dB)	0.50	0.50
TX Switch Loss (dB)	0.15	0.15
TX Filter Loss (dB)	1.80	1.80
RX Filter Loss (dB)	2.10	2.10
Frequency (MHz)	6100.00	
Polarization	Vertical	
Path Length (mi)	5.053	
Free Space Loss (dB)	126.38	
Atmospheric Absorption Loss (dB)	0.13	
Diffraction loss (dB)	2.10	
Net Path Loss (dB)	58.23	58.23
Configuration	HSB (1:10) Diplexer Main	HSB (1:10) Diplexer Main
Radio Model	WVCE61-J0-128A30S-161	WVCE61-J0-128A30S-161
Radio Filename	wvce61_j_4096a30s_258_ep	wvce61_j_4096a30s_258_ep
TX Power at ACU Antenna Port (dBm)	28.05	28.05
TX Power at Top of Rack (dBm)	27.55	27.55
Emission Designator	30M0D7W	30M0D7W
Climatic factor	3.00	

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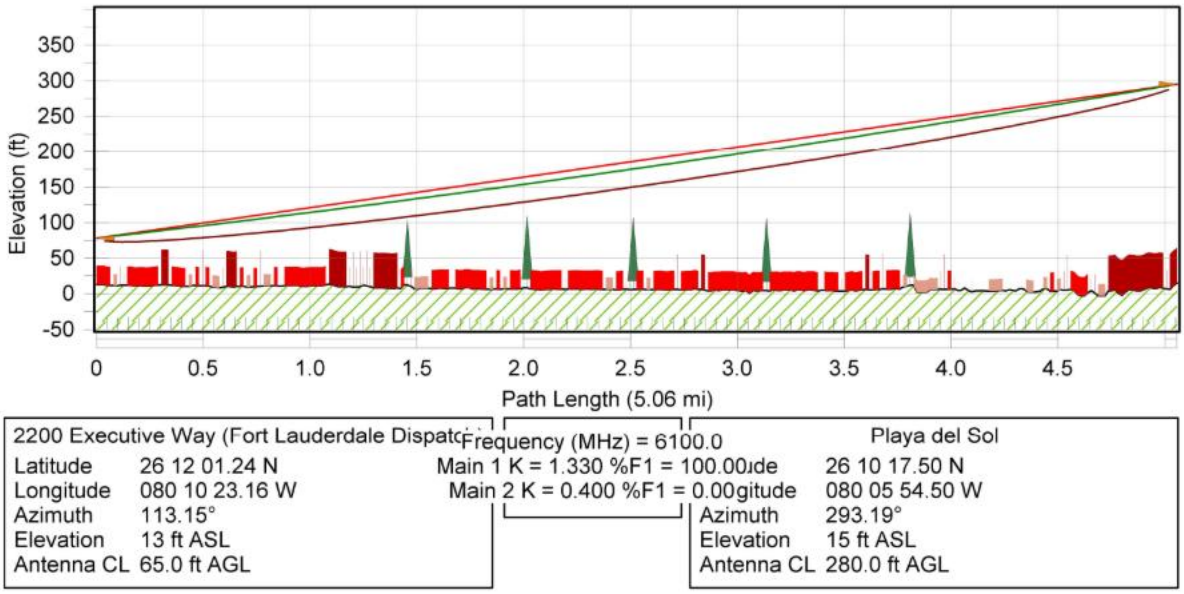
	1300 W Broward	Playa del Sol
Terrain roughness (ft)	20.00	
C factor	9.87	
Average annual temperature (°F)	74.37	
Fade occurrence factor (Po)	1.942E-02	

	TX Power (dBm)		RX Threshold Level (dBm)		EIRP (dBm)		Receive Signal (dBm)		Thermal Fade Margin (dB)		Flat Fade Margin - multipath (dB)	
128 161	**30.00**	**30.00**	**-70.10**	**-70.10**	**65.62**	**64.90**	**-28.23**	**-28.23**	**41.87**	**41.87**	**41.87**	**41.87**
64 136	30.00	30.00	-73.00	-73.00	65.62	64.90	-28.23	-28.23	44.77	44.77	44.77	44.77
32 114	30.00	30.00	-74.90	-74.90	65.62	64.90	-28.23	-28.23	46.67	46.67	46.67	46.67
16 90	30.00	30.00	-78.80	-78.80	65.62	64.90	-28.23	-28.23	50.57	50.57	50.57	50.57
4 43	30.00	30.00	-90.00	-90.00	65.62	64.90	-28.23	-28.23	61.77	61.77	61.77	61.77

	Worst Month Multipath		Annual Multipath		Annual Rain		Total Annual (2 way)	Time in Mode (2 way)
128 161	**99.9999**	**99.9999**	**99.9999**	**99.9999**			**99.9999**	**364:23:59:30.11**
64 136	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:14.50
32 114	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:05.39
16 90	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:05.81
4 43	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:03.69

Multipath fading method - Vigants - Barnett

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Transmission details (Fort Lauderdale Dispatch-Playa del Sol.pl6)

	2200 Executive Way (Fort Lauderdale Dispatch)	Playa del Sol
Latitude	26 12 01.24 N	26 10 17.50 N
Longitude	080 10 23.16 W	080 05 54.50 W
True Azimuth (°)	113.15	293.19
Vertical Angle (°)	0.44	-0.49
Elevation (ft)	13.09	15.12
Tower height (ft)	70.00	280.00
Tower Type	Monopole	Roof mount
Antenna Model	VHLP6-6W (TR)	VHLP6-6W (TR)
Antenna Filename	vhlp6-6w	vhlp6-6w
Antenna Gain (dBi)	39.30	39.30
Antenna Height (ft)	65.00	280.00
TX Line Model	EW63	EW63
TX Line Unit Loss (dB/100 ft)	1.45	1.45
TX Line Length (ft)	95.00	100.00
TX Line Loss (dB)	1.38	1.45
Connector Loss (dB)	0.50	0.50
Extender Loss (dB)	0.50	0.50
TX Switch Loss (dB)	0.15	0.15
TX Filter Loss (dB)	1.80	1.80
RX Filter Loss (dB)	2.10	2.10
Frequency (MHz)	6100.00	
Polarization	Vertical	
Path Length (mi)	5.057	
Free Space Loss (dB)	126.38	
Atmospheric Absorption Loss (dB)	0.13	
Diffraction loss (dB)	0.00	
Net Path Loss (dB)	56.79	56.79
Configuration	HSB (1:10) Diplexer Main	HSB (1:10) Diplexer Main
Radio Model	WVCE61-J0-128A30S-161	WVCE61-J0-128A30S-161
Radio Filename	wvce61_j_4096a30s_258_ep	wvce61_j_4096a30s_258_ep
TX Power at ACU Antenna Port (dBm)	26.05	26.05
TX Power at Top of Rack (dBm)	25.55	25.55
Emission Designator	30M0D7W	30M0D7W
Climatic factor	3.00	

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	2200 Executive Way (Fort Lauderdale Dispatch)	Playa del Sol
Terrain roughness (ft)	20.00	
C factor	9.87	
Average annual temperature (°F)	74.32	
Fade occurrence factor (Po)	1.947E-02	

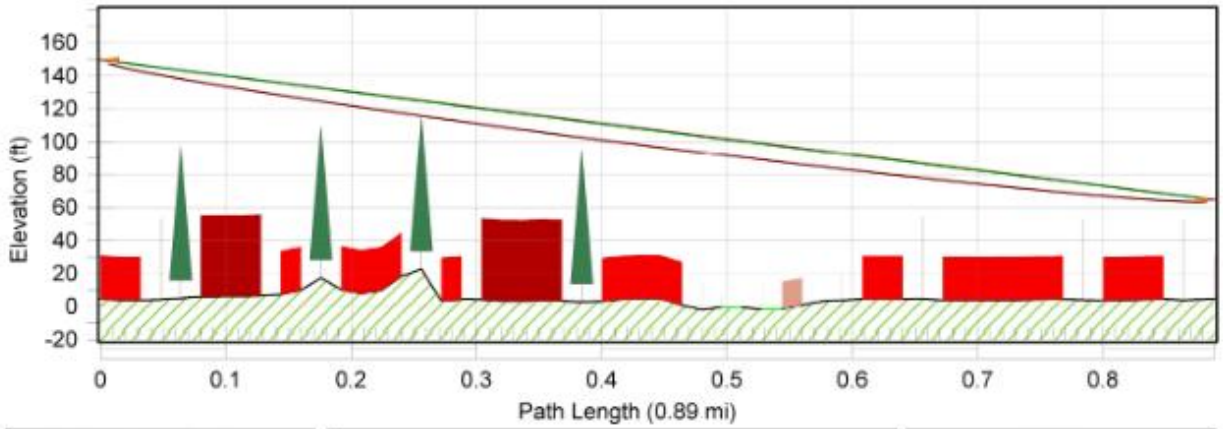
	TX Power (dBm)		RX Threshold Level (dBm)		EIRP (dBm)		Receive Signal (dBm)		Thermal Fade Margin (dB)		Flat Fade Margin - multipath (dB)	
128 161	**28.00**	**28.00**	**-70.10**	**-70.10**	**62.97**	**62.90**	**-28.79**	**-28.79**	**41.31**	**41.31**	**41.31**	**41.31**
64 136	28.00	28.00	-73.00	-73.00	62.97	62.90	-28.79	-28.79	44.21	44.21	44.21	44.21
32 114	28.00	28.00	-74.90	-74.90	62.97	62.90	-28.79	-28.79	46.11	46.11	46.11	46.11
16 90	28.00	28.00	-78.80	-78.80	62.97	62.90	-28.79	-28.79	50.01	50.01	50.01	50.01
4 43	28.00	28.00	-90.00	-90.00	62.97	62.90	-28.79	-28.79	61.21	61.21	61.21	61.21

	Worst Month Multipath		Annual Multipath		Annual Rain		Total Annual (2 way)	Time in Mode (2 way)
128 161	**99.9999**	**99.9999**	**99.9999**	**99.9999**			**99.9999**	**364:23:59:25.98**
64 136	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:16.51
32 114	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:06.14
16 90	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:06.62
4 43	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:04.21

Multipath fading method - Vigants - Barnett

MOTOROLA SOLUTIONS

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SLERs (State of Florida)	
Latitude	26 07 25.60 N
Longitude	080 10 20.00 W
Azimuth	99.53°
Elevation	5 ft ASL
Antenna CL	145.0 ft AGL

Frequency (MHz) = 11200.0
Main 1 K = 1.330 %F1 = 100.00
Main 2 K = 0.400 %F1 = 0.00

1300 W Broward	
Latitude	26 07 17.90 N
Longitude	080 09 29.22 W
Azimuth	279.54°
Elevation	5 ft ASL
Antenna CL	60.0 ft AGL

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Transmission details (SLERs (State of Florida)-1300 W Broward.pl6)

	SLERs (State of Florida)	1300 W Broward
Latitude	26 07 25.60 N	26 07 17.90 N
Longitude	080 10 20.00 W	080 09 29.22 W
True Azimuth (°)	99.53	279.54
Vertical Angle (°)	-1.04	1.03
Elevation (ft)	4.62	4.61
Tower height (ft)	350.00	60.00
Tower Type	Self Supporting	Roof mount
Antenna Model	VHLP3-11W (TR)	VHLP3-11W (TR)
Antenna Filename	vhlp3-11w	vhlp3-11w
Antenna Gain (dBi)	38.40	38.40
Antenna Height (ft)	145.00	60.00
TX Line Model	EW90	EW90
TX Line Unit Loss (dB/100 ft)	3.06	3.06
TX Line Length (ft)	175.00	50.00
TX Line Loss (dB)	5.36	1.53
Connector Loss (dB)	0.50	0.50
Extender Loss (dB)	0.50	0.50
TX Switch Loss (dB)	0.15	0.15
TX Filter Loss (dB)	2.10	2.10
RX Filter Loss (dB)	2.20	2.20
Frequency (MHz)	11200.00	
Polarization	Vertical	
Path Length (mi)	0.889	
Free Space Loss (dB)	116.56	
Atmospheric Absorption Loss (dB)	0.05	
Diffraction loss (dB)	0.00	
Net Path Loss (dB)	53.16	53.16
Configuration	HSB (1:10) Diplexer Main	HSB (1:10) Diplexer Main
Radio Model	WVCE11-J1-128A30S-161	WVCE11-J1-128A30S-161
Radio Filename	wvce11_j_4096a30s_258_ep	wvce11_j_4096a30s_258_ep
TX Power at ACU Antenna Port (dBm)	22.75	22.75
TX Power at Top of Rack (dBm)	22.25	22.25
Emission Designator	30M0D7W	30M0D7W
Climatic factor	3.00	

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	SLERs (State of Florida)	1300 W Broward
Terrain roughness (ft)	20.00	
C factor	9.87	
Average annual temperature (°F)	74.35	
Fade occurrence factor (Po)	1.943E-04	
Polarization	Vertical	
Rain Region	West Palm Beach, Florida	

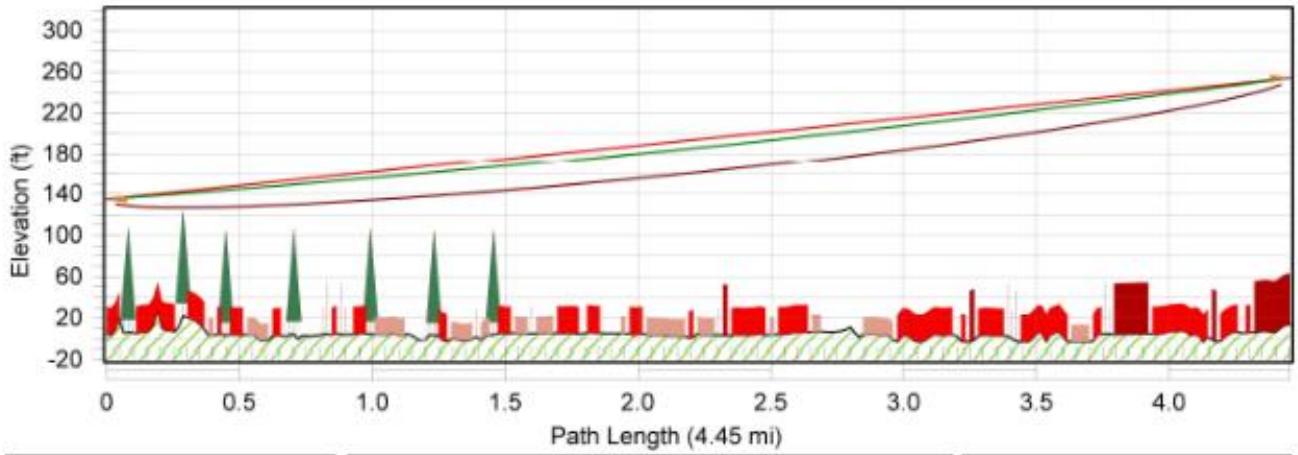
	TX Power (dBm)		RX Threshold Level (dBm)		EIRP (dBm)		Receive Signal (dBm)		Thermal Fade Margin (dB)		Flat Fade Margin - multipath (dB)	
128 161	**25.00**	**25.00**	**-69.60**	**-69.60**	**54.79**	**58.62**	**-28.16**	**-28.16**	**41.44**	**41.44**	**41.44**	**41.44**
64 136	25.00	25.00	-72.50	-72.50	54.79	58.62	-28.16	-28.16	44.34	44.34	44.34	44.34
32 114	25.00	25.00	-74.40	-74.40	54.79	58.62	-28.16	-28.16	46.24	46.24	46.24	46.24
16 90	25.00	25.00	-78.30	-78.30	54.79	58.62	-28.16	-28.16	50.14	50.14	50.14	50.14
4 43	25.00	25.00	-89.50	-89.50	54.79	58.62	-28.16	-28.16	61.34	61.34	61.34	61.34

	Worst Month Multipath		Annual Multipath		Annual Rain		Total Annual (2 way)	Time in Mode (2 way)
128 161	**99.9999**	**99.9999**	**99.9999**	**99.9999**	**99.9999**	**99.9999**	**99.9999**	**364:23:59:59.67**
64 136	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	000:00:00:00.16
32 114	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	000:00:00:00.06
16 90	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	000:00:00:00.06
4 43	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	000:00:00:00.04

Multipath fading method - Vigants - Barnett
Rain fading method - Crane

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SLERs (State of Florida)	
Latitude	26 07 25.60 N
Longitude	080 10 20.00 W
Azimuth	114.87°
Elevation	5 ft ASL
Antenna CL	130.0 ft AGL

Frequency (MHz) = 6100.0
Main 1 K = 1.330 %F1 = 100.00
Main 2 K = 0.400 %F1 = 0.00

Point of America	
Latitude	26 05 47.60 N
Longitude	080 06 26.00 W
Azimuth	294.90°
Elevation	14 ft ASL
Antenna CL	240.0 ft AGL

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Transmission details (SLERs-Point of America.pl6)

	SLERs (State of Florida)	Point of America
Latitude	26 07 25.60 N	26 05 47.60 N
Longitude	080 10 20.00 W	080 06 26.00 W
True Azimuth (°)	114.87	294.90
Vertical Angle (°)	0.27	-0.31
Elevation (ft)	4.62	13.82
Tower height (ft)	350.00	240.00
Tower Type	Self Supporting	Roof mount
Antenna Model	VHLP6-6W (TR)	VHLP6-6W (TR)
Antenna Filename	vhlp6-6w	vhlp6-6w
Antenna Gain (dBi)	39.30	39.30
Antenna Height (ft)	130.00	240.00
TX Line Model	EW63	EW63
TX Line Unit Loss (dB/100 ft)	1.45	1.45
TX Line Length (ft)	160.00	100.00
TX Line Loss (dB)	2.32	1.45
Connector Loss (dB)	0.50	0.50
Extender Loss (dB)	0.50	0.50
TX Switch Loss (dB)	0.15	0.15
TX Filter Loss (dB)	1.80	1.80
RX Filter Loss (dB)	2.10	2.10
Frequency (MHz)	6100.00	
Polarization	Vertical	
Path Length (mi)	4.454	
Free Space Loss (dB)	125.28	
Atmospheric Absorption Loss (dB)	0.11	
Diffraction loss (dB)	0.00	
Net Path Loss (dB)	56.61	56.61
Configuration	HSB (1:10) Diplexer Main	HSB (1:10) Diplexer Main
Radio Model	WVCE61-J0-128A30S-161	WVCE61-J0-128A30S-161
Radio Filename	wvce61_j_4096a30s_258_ep	wvce61_j_4096a30s_258_ep
TX Power at ACU Antenna Port (dBm)	26.55	26.55
TX Power at Top of Rack (dBm)	26.05	26.05
Emission Designator	30M0D7W	30M0D7W
Climatic factor	3.00	

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	SLERs (State of Florida)	Point of America
Terrain roughness (ft)	20.00	
C factor	9.87	
Average annual temperature (°F)	74.40	
Fade occurrence factor (Po)	1.330E-02	

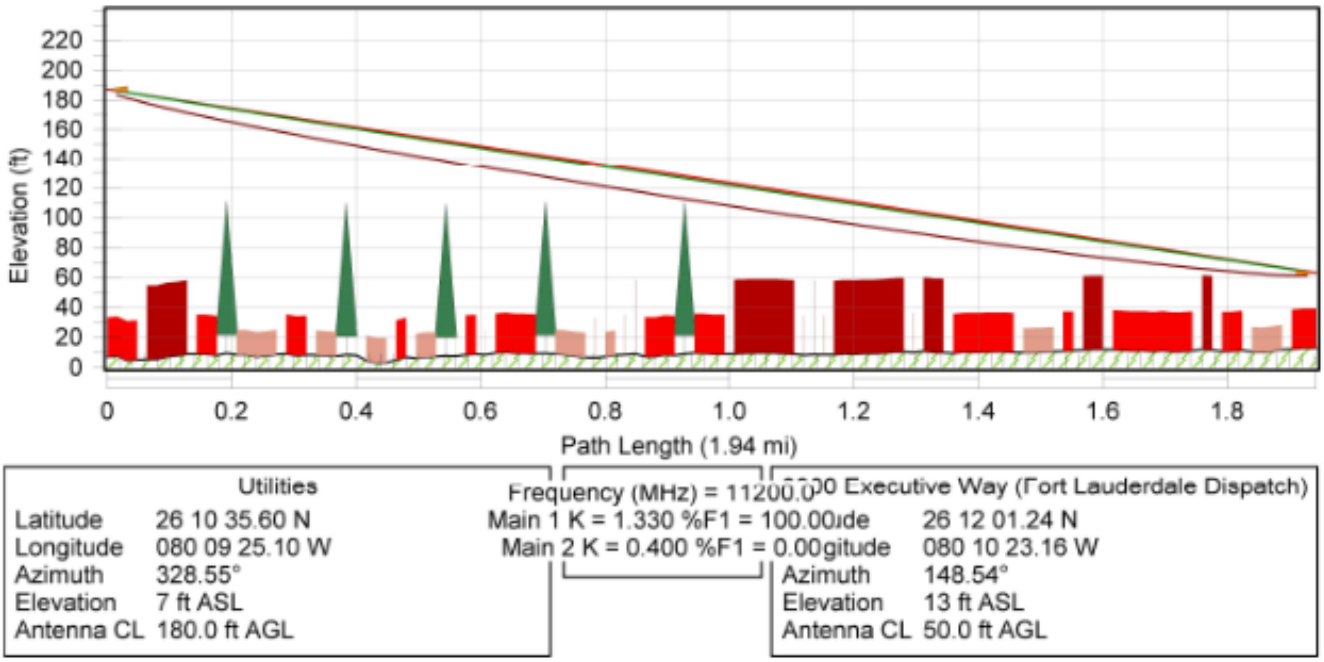
	TX Power (dBm)		RX Threshold Level (dBm)		EIRP (dBm)		Receive Signal (dBm)		Thermal Fade Margin (dB)		Flat Fade Margin - multipath (dB)	
128 161	**28.50**	**28.50**	**-70.10**	**-70.10**	**62.53**	**63.40**	**-28.11**	**-28.11**	**41.99**	**41.99**	**41.99**	**41.99**
64 136	28.50	28.50	-73.00	-73.00	62.53	63.40	-28.11	-28.11	44.89	44.89	44.89	44.89
32 114	28.50	28.50	-74.90	-74.90	62.53	63.40	-28.11	-28.11	46.79	46.79	46.79	46.79
16 90	28.50	28.50	-78.80	-78.80	62.53	63.40	-28.11	-28.11	50.69	50.69	50.69	50.69
4 43	28.50	28.50	-90.00	-90.00	62.53	63.40	-28.11	-28.11	61.89	61.89	61.89	61.89

	Worst Month Multipath		Annual Multipath		Annual Rain		Total Annual (2 way)	Time in Mode (2 way)
128 161	**99.9999**	**99.9999**	**99.9999**	**99.9999**			**99.9999**	**364:23:59:40.10**
64 136	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:09.66
32 114	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:03.59
16 90	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:03.88
4 43	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:02.46

Multipath fading method - Vigants - Barnett

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Transmission details (Utilities-Fort Lauderdale Dispatch.pl6)

	Utilities	2200 Executive Way (Fort Lauderdale Dispatch)
Latitude	26 10 35.60 N	26 12 01.24 N
Longitude	080 09 25.10 W	080 10 23.16 W
True Azimuth (°)	328.55	148.54
Vertical Angle (°)	-0.70	0.68
Elevation (ft)	7.07	13.09
Tower height (ft)	200.00	70.00
Tower Type	Self Supporting	Monopole
Antenna Model	VHLP3-11W (TR)	VHLP3-11W (TR)
Antenna Filename	vhlp3-11w	vhlp3-11w
Antenna Gain (dBi)	38.40	38.40
Antenna Height (ft)	180.00	50.00
TX Line Model	EW90	EW90
TX Line Unit Loss (dB/100 ft)	3.06	3.06
TX Line Length (ft)	210.00	80.00
TX Line Loss (dB)	6.43	2.45
Connector Loss (dB)	0.50	0.50
Extender Loss (dB)	0.50	0.50
TX Switch Loss (dB)	0.15	0.15
TX Filter Loss (dB)	2.10	2.10
RX Filter Loss (dB)	2.20	2.20
Frequency (MHz)	11200.00	
Polarization	Vertical	
Path Length (mi)	1.943	
Free Space Loss (dB)	123.35	
Atmospheric Absorption Loss (dB)	0.12	
Diffraction loss (dB)	0.00	
Net Path Loss (dB)	62.01	62.01
Configuration	HSB (1:10) Diplexer Main	HSB (1:10) Diplexer Main
Radio Model	WVCE11-J1-128A30S-161	WVCE11-J1-128A30S-161
Radio Filename	wvce11_j_4096a30s_258	wvce11_j_4096a30s_258
TX Power at ACU Antenna Port (dBm)	30.25	30.25
TX Power at Top of Rack (dBm)	29.75	29.75
Emission Designator	30M0D7W	30M0D7W
Climatic factor	3.00	

MOTOROLA SOLUTIONS

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	Utilities	2200 Executive Way (Fort Lauderdale Dispatch)
Terrain roughness (ft)	20.00	
C factor	9.87	
Average annual temperature (°F)	74.27	
Fade occurrence factor (Po)	2.027E-03	
Polarization	Vertical	
Rain Region	West Palm Beach, Florida	

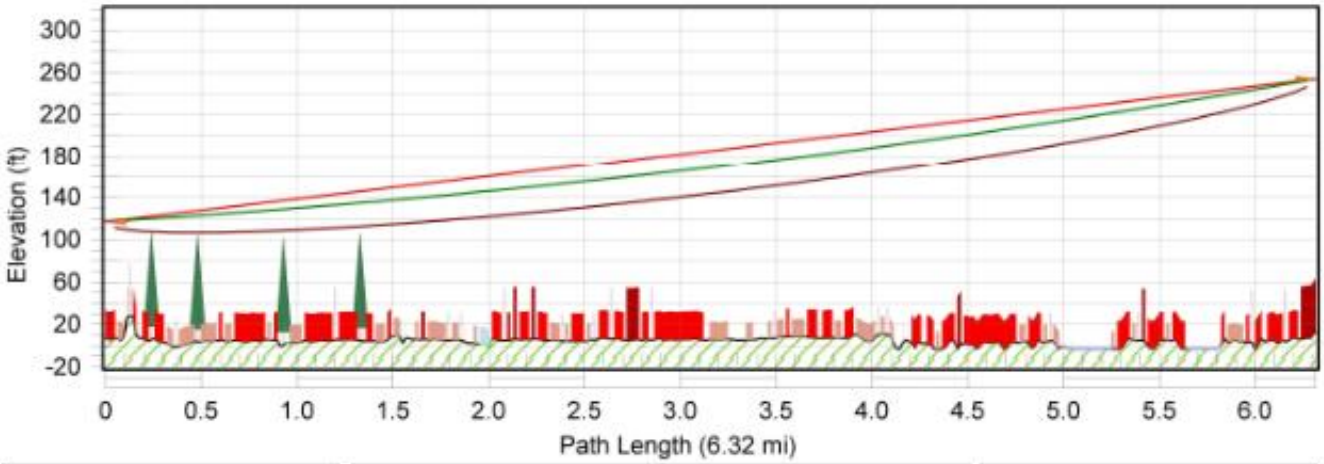
	TX Power (dBm)		RX Threshold Level (dBm)		EIRP (dBm)		Receive Signal (dBm)		Thermal Fade Margin (dB)		Flat Fade Margin - multipath (dB)	
128 161	**32.50**	**32.50**	**-69.60**	**-69.60**	**61.22**	**65.20**	**-29.51**	**-29.51**	**40.09**	**40.09**	**40.09**	**40.09**
64 136	32.50	32.50	-72.50	-72.50	61.22	65.20	-29.51	-29.51	42.99	42.99	42.99	42.99
32 114	32.50	32.50	-74.40	-74.40	61.22	65.20	-29.51	-29.51	44.89	44.89	44.89	44.89
16 90	32.50	32.50	-78.30	-78.30	61.22	65.20	-29.51	-29.51	48.79	48.79	48.79	48.79
4 43	32.50	32.50	-89.50	-89.50	61.22	65.20	-29.51	-29.51	59.99	59.99	59.99	59.99

	Worst Month Multipath		Annual Multipath		Annual Rain		Total Annual (2 way)	Time in Mode (2 way)
128 161	**99.9999**	**99.9999**	**99.9999**	**99.9999**	**99.9999**	**99.9999**	**99.9999**	**364:23:59:55.35**
64 136	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	000:00:00:02.26
32 114	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	000:00:00:00.84
16 90	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	000:00:00:00.91
4 43	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	99.9999	000:00:00:00.58

Multipath fading method - Vigants - Barnett
Rain fading method - Crane

MOTOROLA SOLUTIONS

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Utilities	
Latitude	26 10 35.60 N
Longitude	080 09 25.10 W
Azimuth	150.68°
Elevation	7 ft ASL
Antenna CL	110.0 ft AGL

Frequency (MHz) = 6100.0
Main 1 K = 1.330 %F1 = 100.00
Main 2 K = 0.400 %F1 = 0.00

Point of America	
Latitude	26 05 47.60 N
Longitude	080 06 26.00 W
Azimuth	330.70°
Elevation	14 ft ASL
Antenna CL	240.0 ft AGL

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Transmission details (Utilities-Point of America.pl6)

	Utilities	Point of America
Latitude	26 10 35.60 N	26 05 47.60 N
Longitude	080 09 25.10 W	080 06 26.00 W
True Azimuth (°)	150.68	330.70
Vertical Angle (°)	0.20	-0.27
Elevation (ft)	7.07	13.82
Tower height (ft)	200.00	240.00
Tower Type	Self Supporting	Roof mount
Antenna Model	VHLP6-6W (TR)	VHLP6-6W (TR)
Antenna Filename	vhlp6-6w	vhlp6-6w
Antenna Gain (dBi)	39.30	39.30
Antenna Height (ft)	110.00	240.00
TX Line Model	EW63	EW63
TX Line Unit Loss (dB/100 ft)	1.45	1.45
TX Line Length (ft)	140.00	100.00
TX Line Loss (dB)	2.03	1.45
Connector Loss (dB)	0.50	0.50
Extender Loss (dB)	0.50	0.50
TX Switch Loss (dB)	0.15	0.15
TX Filter Loss (dB)	1.80	1.80
RX Filter Loss (dB)	2.10	2.10
Frequency (MHz)	6100.00	
Polarization	Vertical	
Path Length (mi)	6.316	
Free Space Loss (dB)	128.32	
Atmospheric Absorption Loss (dB)	0.16	
Diffraction loss (dB)	0.00	
Net Path Loss (dB)	59.40	59.40
Configuration	HSB (1:10) Diplexer Main	HSB (1:10) Diplexer Main
Radio Model	WVCE61-J0-128A30S-161	WVCE61-J0-128A30S-161
Radio Filename	wvce61_j_4096a30s_258_ep	wvce61_j_4096a30s_258_ep
TX Power at ACU Antenna Port (dBm)	29.05	29.05
TX Power at Top of Rack (dBm)	28.55	28.55
Emission Designator	30M0D7W	30M0D7W
Climatic factor	3.00	

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	Utilities	Point of America
Terrain roughness (ft)	20.00	
C factor	9.87	
Average annual temperature (°F)	74.38	
Fade occurrence factor (Po)	3.793E-02	

	TX Power (dBm)		RX Threshold Level (dBm)		EIRP (dBm)		Receive Signal (dBm)		Thermal Fade Margin (dB)		Flat Fade Margin - multipath (dB)	
128 161	**31.00**	**31.00**	**-70.10**	**-70.10**	**65.32**	**65.90**	**-28.40**	**-28.40**	**41.70**	**41.70**	**41.70**	**41.70**
64 136	31.00	31.00	-73.00	-73.00	65.32	65.90	-28.40	-28.40	44.60	44.60	44.60	44.60
32 114	31.00	31.00	-74.90	-74.90	65.32	65.90	-28.40	-28.40	46.50	46.50	46.50	46.50
16 90	31.00	31.00	-78.80	-78.80	65.32	65.90	-28.40	-28.40	50.40	50.40	50.40	50.40
4 43	31.00	31.00	-90.00	-90.00	65.32	65.90	-28.40	-28.40	61.60	61.60	61.60	61.60

	Worst Month Multipath		Annual Multipath		Annual Rain		Total Annual (2 way)	Time in Mode (2 way)
128 161	**99.9997**	**99.9997**	**99.9999**	**99.9999**			**99.9998**	**364:23:58:58.99**
64 136	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:29.54
32 114	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:10.97
16 90	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:11.82
4 43	99.9999	99.9999	99.9999	99.9999			99.9999	000:00:00:07.51

Multipath fading method - Vigants - Barnett

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City of Fort Lauderdale

Attachment 23 - Test and Alignment Verification Process

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.12.2.4 Test and Alignment Verification Process

Motorola has provided a section from our hardware installation and replacement manual on how to conduct an antenna alignment in the following pages.

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Table 75: NMS cable pinout

Function	End 1 Core-E (RJ45)	Pair	Wire color	End 2 PC (RJ45)
TD+	1	3	White/Green	1
TD-	2		Green	2
RD+	3	2	White/Orange	3
Not Used	4	1	Blue	4
Not Used	5		White/Blue	5
RD-	6	2	Orange	6
Not Used	7	4	White/Brown	7
Not Used	8		Brown	8

The procedure is complete.

3.37 Antenna alignment

This chapter describes how to perform an antenna alignment.

3.37.1 General

An antenna alignment involves adjusting the direction of each antenna until the received signal strength reaches its maximum level at each end of the link. Fine adjustment for azimuth (horizontal angle) and elevation (vertical angle) is built into each antenna mount.

Adjustment procedures are provided with each antenna. If the horizontal adjuster does not provide sufficient range to locate the main beam, the antenna mounting brackets will need to be loosened and the antenna swiveled on its pole mount to locate the beam.

Before doing this, ensure the horizontal adjuster is set for mid-travel.

Some mounts for larger antennas have a separately clamped swivel base to allow the loosened antenna to swivel on it without fear of slippage down the pole. Where such a mount is not provided a temporary swivel clamp can often be provided using a pair of pipe brackets bolted together immediately below the antenna mount.

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3.37.1.1 Preparation

> **WARNING!**
>
> To Ensure continuity and avoid short circuits, all RJ45, Coaxial, Ethernet, Optical Fiber. cables / connector connections made in the field must be verified and checked with a Cable tester. Also, the weatherproofing must be checked.

Before aligning antennas ensure:

- The ODUs are powered up at both ends of the link.
- Transmit and receive frequencies are correctly set.
- Transmit powers are correctly set and transmit mute is turned off.

> **Note:**
>
> If frequency and/or power settings are not correct for the application, interference may be caused to other links in the same geographical area.

See the Wavence Product Information Manual for equipment part numbers.

3.37.1.2 Signal measurement

Two receive signal-strength indicators are provided to assist antenna alignment, RSL in the WTPMS tool, and the RSSI voltage at the radio. See:

- Using RSL data for any radio
- MPT/AWY service cable operative information
- Using the RSSI voltage at the MPT-HLS/HLC

3.37.1.2.1 Using RSL data for any radio

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Purpose

To align using RSL.

Since RSL data is accessed using the craft terminal connection to the MSS, a separate means of communication such as two-way radio or cell phone is required between the CT operator and the person at the antenna. See the Wavence WebEML User Manual for more information about performance monitoring.

Procedure

1. **Monitor RSL in the WTPMS.**
2. **Set antenna alignment for maximum RSL.**
3. **Repeat for the far end of the link.**
4. **Compare actual RSLs with the expected RSLs from the link installation data sheet. RSL measurement accuracies:**
   - ± 2 dB for levels -40 to -70 dBm, over a temperature range of 0 to +35°C.
   - ±4 dB for levels -25 to -85 dBm, over an extended -33 to +55°C range.

3.37.1.2.2 Using the RSSI voltage for MPT ODU

Purpose

A voltmeter, such as a multi meter and MPT/AWY Service cable, is used to measure RSSI voltage.

Procedure

1. **Connect a voltmeter to the MPT ODU using the MPT/AWY service cable.**
2. **Adjust antenna alignment until the voltage reading is at maximum value.**
3. **Repeat for the far end of the link.**
4. **Compare actual RSLs to the expected RSLs from the link installation data sheet. See RSL measurement guidelines .**

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Verify and record the peak voltage at each end. The RSSI voltage provides a direct relationship with RSL, as follows:

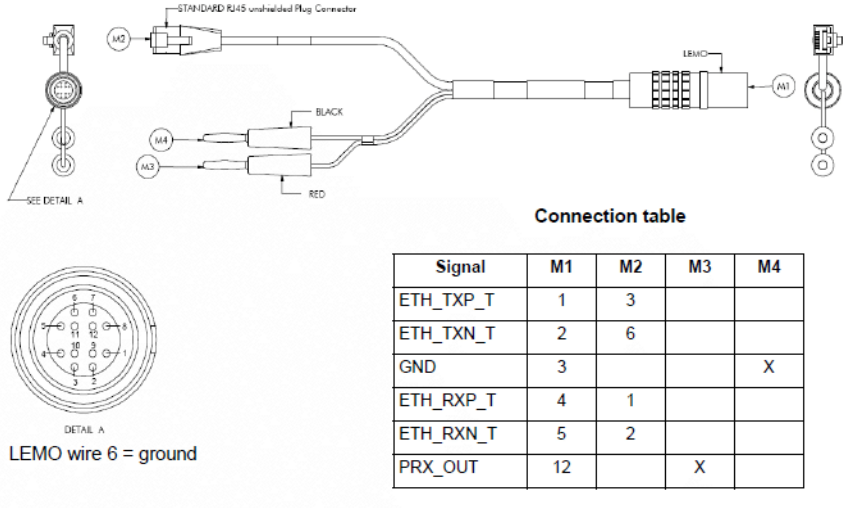
Table 76: Typical RSSI voltage levels with RSL for MPT-HC/HC-HQAM/MC/XP/XP-HQAM

Units	Measurement (with MPT ODU)									
Service kit cable (Vdc)	5	4.71	4.12	3.5	2.9	2.3	1.71	1.11	0.59	0.14
RSL (dBm)	-10	-20	-30	-40	-50	-60	-70	-80	-90	-100

3.37.1.2.2.1 MPT/AWY service cable operative information

Figure: MPT/AWY service cable shows this optional cable.

Figure 507: MPT/AWY service cable



Connection table

Signal	M1	M2	M3	M4
ETH_TXP_T	1	3		
ETH_TXN_T	2	6		
GND	3			X
ETH_RXP_T	4	1		
ETH_RXN_T	5	2		
PRX_OUT	12		X	

- Connector usage:
  - (M1) LEMO connector, plugs into LEMO connector on MPT ODU.
  - banana plugs (M3) and (M4): output is a 0 to +5V DC voltage proportional to the radio Rx field. During equipment line–up, through a multi–meter it is possible to easily point the antenna until the measured voltage is the maximum, corresponding to the maximum radio Rx field.
  - (M2) RJ45 connector, to connect MCT directly to the MPT.

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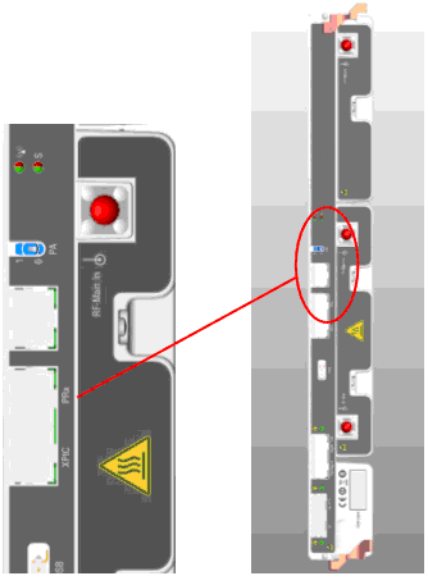
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3.37.1.2.3 Using the RSSI voltage at the MPT-HLS/HLC

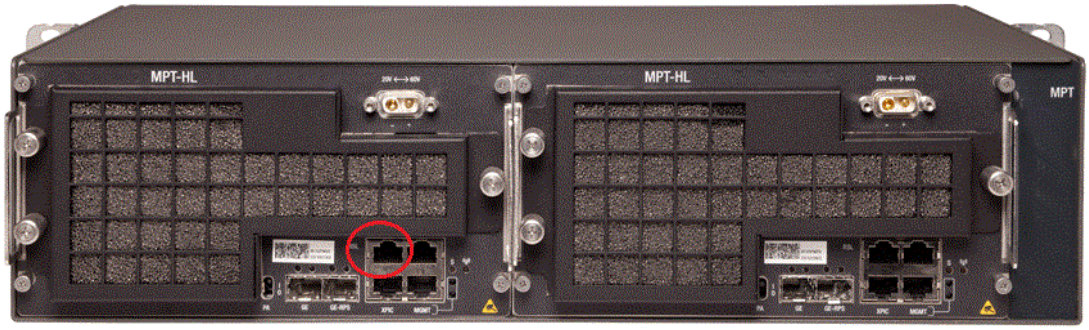
A voltmeter, such as a multimeter, is used to measure RSSI voltage.Use the MPT-HLS/HLC RSSI voltage cable in addition to the voltmeter.

To measure the signal using the RSL voltage:

1. Connect a voltmeter to the port on the transceiver using the MPT-HLS/HLC RSSI voltage cable:
   - For the MPT-HLS: PRx port (see Figure: PRx port on the MPT-HLS)
     Figure 508: PRx port on the MPT-HLS



   - For the MPT-HLC: RSL port (see Figure: RSL port on the MPT-HLC)
     Figure 509: RSL port on the MPT-HLC



2. Perform antenna alignment and maximize the voltage reading.
3. Repeat for the far end of the link.
   Check and record the peak voltage at each end. The RSSI voltage provides a direct

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relationship with RSL. Table: Typical RSSI voltage levels with RSL for MPT-HLS/HLC shows the typical values to be expected:

Table 77: Typical RSSI voltage levels with RSL for MPT-HLS/HLC

Units	Measurements (with MPT-HLS/HLC)								
PRX cord (Vdc)	4.94	4.31	3.72	3.10	2.46	1.86	1.25	0.62	0.26
RSL (dBm)	-20	-30	-40	-50	-60	-70	-80	-90	-100

4. Compare actual RSL to the expected RSLs from the link installation datapack. See RSL measurement guidelines .

MPT-HLS/HLC RSSI voltage cable operative information

Figure: MPT-HLS/HLC RSSI voltage cable for RSSI voltage reading shows the cable used for RSSI voltage readings during antenna alignment. The cable permits the measurements of RSSI levels for both the main receiver and the diversity receiver when present. Table: Wiring table for PRx cable provides connection information.

Figure 510: MPT-HLS/HLC RSSI voltage cable for RSSI voltage reading

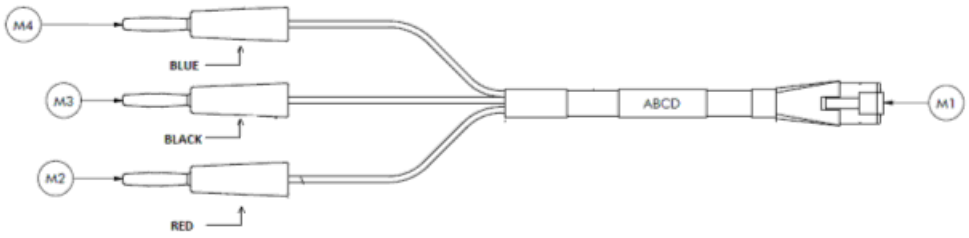


Table 78: Wiring table for PRx cable

Signal	M1 standard RJ45 unshielded plug connector	M2 red banana plug	M3 black banana plug	M4 blue banana plug
RX PW MAIN	6	X		
GND	7		X	
RX PW DIV	8			X

The RJ45 connector (M1) must be plugged to the PRX connector on the MPT-HL transceiver.

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The black banana plug (M3) must be plugged to the common of the voltmeter/multimeter. The red banana plug (M2) will provide the Vdc level (positive) relative to the Main receiver power level. The blue banana plug (M4) will provide the Vdc level (positive) relative to the Diversity receiver (if present).

3.37.1.3 RSL measurement guidelines

When verifying the RSSI/RSL against the predicted link values ensure appropriate allowances are made for Tx power-setting accuracy, path-loss calculation accuracy, and RSSI/RSL measurement accuracy.

- For a worst-case the overall accuracy is the sum of the individual accuracy limits, which for a link would be ±4 dB of the predicted value (±2 dB for transmit, ±2 dB for receive, 0 to 35°C), aside from the path-loss calculation accuracy, which should be within limits of ±3 dB.
- Typically, when the measured RSSI/RSL is more than 4 dB lower than the expected receive level, check the path survey results, path calculations and antenna alignment.

  Note:

  When checking RSSI/RSL, ensure the measurement is made under normal, unfaded and interference-free path conditions.

- A discrepancy of 20 dB or greater between the measured and calculated RSSI/ RSLs suggests an antenna is aligned on a side lobe, or there is a polarization mismatch.

3.37.1.4 Main beams and side lobes

This section describes how to locate the main beam, and typical tracking path errors.

Locating the main beam

Ensure the antennas are aligned on the main beam, and not a side lobe.

Once a measurable signal is observed, very small alignment adjustments are required to locate the main beam. For instance, a 1.2m antenna at 23 GHz typically has 0.9° of adjustment from center of main beam to the first null (0.4° to the -3 dB point). Antenna movement across the main beam will result in a rapid rise and fall of signal level. As a guide,

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1 degree of beam width is equivalent to moving approximately 1.0 mm around a standard 114 mm (4.5 in.) diameter O/D pipe.

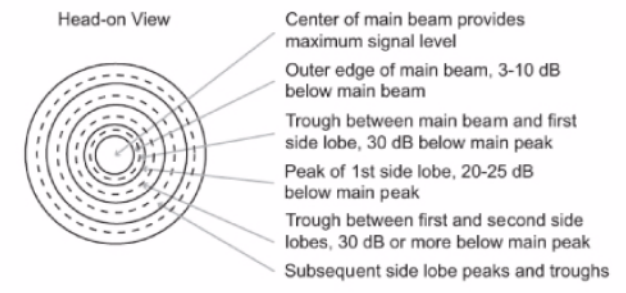
Antennas can be verified as being on main beam (as opposed to a side lobe) by comparing measured receive signal level with the calculated level.

Signal strength readings are usually measurable when at least a main beam at one end and first side lobes at the other are aligned.

The strongest signal occurs at the center of the main beam. The highest first lobe signal is typically 20 - 25 dB less than the main beam signal. When both antennas are aligned for maximum main beam signal strength, the receive signal level should be within 2 dB of the calculated level for the path. This calculated level should be included in the installation data sheet for the link.

Figure: Indicative head-on signal pattern for a parabolic antenna shows an example of a head-on, conceptual view of the beam signal strength, with concentric rings of side lobe peaks and troughs radiating outward from the main beam.

Figure 511: Indicative head-on signal pattern for a parabolic antenna



Tracking path error

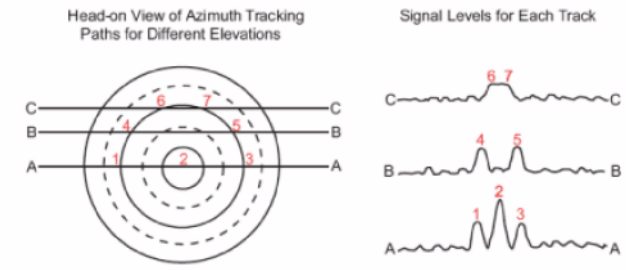
Side lobe signal readings can be confused with main beam readings. This is particularly true for the first side lobe as the signal level at its center is greater than the signal level at the edges of the main beam, and if tracking on an incorrect elevation (or azimuth) a false impression of main beam reception can be obtained. This illustration shows an example of this with a simplified head-on view of an antenna radiation pattern, and tracking paths for three elevation settings.

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Figure 512: Example tracking path signals

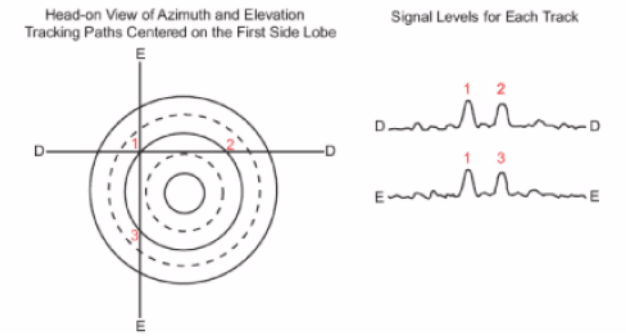


Line AA represents the azimuth tracking path of a properly aligned antenna.The main beam is at point 2, and the first side lobes at points 1 and 3. Line BB represents the azimuth tracking path with the antenna tilted down slightly. Signal strength readings show only the first side lobe peaks, 4 and 5. In some instances the side lobe peaks are unequal due to antenna characteristics, which can lead to the larger peak being mistaken for the main beam. The correct method for locating the main beam in this case is to set the azimuth position midway between the first side lobe peaks, and then adjust the elevation for maximum signal.

Line CC represents an azimuth tracking path with the antenna tilted down further still. The first side lobe signal peaks (6 and 7) appear as one peak, leading to a mistaken interpretation of a main beam. The correct method for locating the main beam is to set the azimuth at mid peak, between 6 and 7, and then adjust elevation for maximum signal.

This first side lobe peaking is probably the most frequent cause of misalignment in both azimuth and elevation, especially so if one side lobe peaks higher than the other, as shown in Figure: Example tracking path signals on the first side lobe . A common error is to move the antenna left to right along line DD, or top to bottom along line EE, always ending up with the maximum signal at position 1.

Figure 513: Example tracking path signals on the first side lobe



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3.37.2 Recommended tools

- Multi meter
- MPT/AWY Service Cable or MPT-HLS/HLC RSSI voltage cable

3.37.3 Procedure

Purpose

> **Note:**
>
> Ensure antennas are aligned on the main beam, and not a side lobe. For guidance, refer to the sections Locating the Main Beam and Tracking Path Error. Ensure ATPC is turned off during the alignment procedure.

Procedure

1. **Loosen the azimuth adjuster on the antenna mount (horizontal angle) and adjust azimuth position for maximum signal strength. Ensure antennas are aligned on the main beam, and not a side lobe.**
2. **Tighten the azimuth securing mechanism. Ensure signal strength does not drop as it is tightened.**
3. **Loosen the elevation adjuster (vertical angle) and adjust for maximum signal strength. Ensure antennas are aligned on the main beam, and not a side lobe.**
4. **Tighten the elevation securing mechanism. Ensure signal strength does not drop as it is tightened. The terminal is now aligned and ready to carry operational traffic.**
5. **Record RSL and/or RSSI voltage in the commissioning log.**

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3.37.4 Additional procedure for CCDP XPIC links with MPT-HC/HC-HQAM/MC/XP/XP-HQAM

Note:

Procedures are provided for the alignment of dual polarized antennas and for protected XPIC links.

For CCDP (Co-channel Dual Polarized) XPIC links it is important that antenna feeds are correctly aligned to achieve optimum XPIC performance.

While a dual-feed antenna may be specified with a cross polarization discrimination of 30 dB, unless the antenna-to-antenna alignment over a link is correct, the effective discrimination can be significantly less.

- The horizontal-to-vertical receive signal discrimination for satisfactory XPIC operation must not be less than 20 dB, and where possible should be set for optimum discrimination using this procedure.
- High performance shielded antennas typically exhibit 30 dB cross polarization discrimination whereas 40 dB is typical for purpose-designed, high polarization discrimination antennas.
- The received-signal V and H discrimination can be checked using the Measurement tab-panel of the MPT-HC/HC-HQAM/MC/XP/XP-HQAM. See Figure: XPD measurement . The cross pole discrimination measures the V and H signal discrimination in dB at the input to the MPT-HC/HC-HQAM/XP/XP-HQAM (from the antenna feeds). The improvement in signal discrimination provided by the XPIC function is in addition to this measurement.

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Figure 514: XPD measurement



3.37.5 Alignment procedure for dual polarized antenna

Purpose

The following procedure details steps required to:

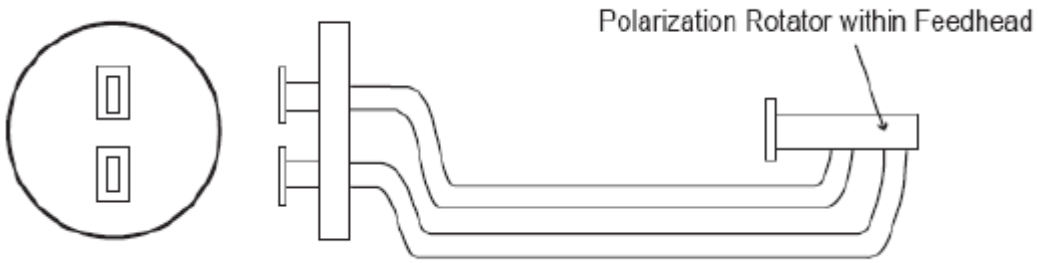
- Set initial feedhead alignment for V and H polarization of antennas in a static way.
- Align the antennas at each end using just one feed, H or V. (Standard co-plane antenna alignment).
  - If the V and H waveguide ports on an antenna are not marked they can be identified by the orientation of the waveguide slots.
  - If a dual-polarized antenna presents the same orientation on both ports, there should be a straight waveguide feed to the antenna feedhead. The other will include a 90 degree twist or have a straight waveguide feed but with a polarization rotator in the feedhead. Generally the polarization rotator will act on the outer-most waveguide on the feedhead.
  - For convention, if ports are not marked for V and H, it is recommended that the port that has the straight waveguide feed or is connected to the inner-most waveguide at the feedhead, should be selected as the horizontal antenna feed port. Figure: Example of antenna feedhead assembly shows an antenna feedhead assembly. The top port is

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connected to the inner feed on the feedhead. With the port orientation shown, it provides a horizontally polarized feed. The lower port has a rotator included in the feedhead to provide a vertical feed.

Figure 515: Example of antenna feedhead assembly



- Ensure the same port is selected for vertical at both ends. Where possible, the same ‘above and below" relationship of the feed ports should be used at both ends. For example, if at one end the horizontal feed port is located above the vertical port, as in the example above, then the same relationship should be used at the other end.

- Check cross pole discrimination (XPD) in the Measurement tab-panel of the MPT-HC/HC-HQAM/XP/XP-HQAM.
- Optimize alignment of the feed-heads to achieve maximum cross polarization discrimination.

> **Note:**
>
> This procedure assumes that the antennas used at each end of the link do comply with their cross-polarization discrimination specification. If in doubt, refer to the antenna supplier.

Procedure

1 Static feedhead alignment

This procedure would normally be completed in conjunction with antenna alignment, step 2 , to ensure no misalignment of skew angle is introduced during the pan and tilt process. It should be completed before any feedhead weatherproofing is applied, so that a spirit level can be used against the flange to check and set precise physical vertical / horizontal alignment of the feeds:

1. Do not rely on antenna markings as these will not be accurate when a mount is not perfectly level.
2. Set the spirit level against the flange of the feedhead. Take care that only the flange

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of the feedhead is measured, so that no error is introduced by any minor misalignment of the mating flexible waveguide flange.

3. If not exactly vertical or horizontal, adjust the feedhead skew angle (rotate the feedhead) until correct (spirit level bubble is precisely centered). For a typical feedhead check both flanges for level, using an end point half way between the level points of the two flanges should there be any discrepancy between the two.

2 Align antennas

- Align the antennas at both ends using the standard (co-plane) alignment procedure, but using just one of the feeds, V or H. See Standard alignment procedure .
- If an integrated antenna is in use, align the OMT or OMT-C. See MPT ODU installation .
- If major adjustment to the pointing of the antenna is made during this process, recheck the feedhead skew angle.
- When correct, go to step 3 .

3 Check operation and end-to-end feedhead alignment.

Power-up both V and H links and check they are operating normally and are alarm-free. Use the Measurement tab-panel of the MPT-HC/HC-HQAM/XP/XP-HQAM to check that:

1. Tx power measurements are within 1 dB (typically). If not check Tx power settings.
2. RSL measurements are within 2 dB. See Using RSL data for any radio for guidance on measurement accuracy.
3. Links are operating error-free.
   Note: Where there is potential for interference from other links in the same geographical area, check by turning the far end transmitter(s) off and measuring the local end RSL on both V and H feeds.

4 Check XPD performance.

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Note:

This operation must be performed in the following conditions:

- good weather conditions (clear sky condition, no rain, snow, fog)
- using the middle frequency channel in case of multichannel links
- no external interferences
- no alarms or errors in the link

The verification is done by reading the cross polar discrimination (XPD) values reported in the Measurement tab-panel of the MPT-HC/HC-HQAM/XP-HQAM. This value, when antennas are properly aligned, should be close to the static XPD guaranteed by the antenna (between 30 and 40dB depending on the antenna type). Anyway, MPT system is accepting values better than 25dB, so this value can be considered the minimum acceptable one.

Read XPD values in the Measurement Tab-Panel and evaluate each condition:

- XPD is <25dB: it means that the initial feedhead setting is not sufficient. Go to optimization steps (5 to 7 in this procedure).
- XPD is in between 25 and 35dB: the XPD value for the link is acceptable. But it is worth performing the optimization steps (5 to 7 in this procedure) for maximizing the XPD.
- XPD value is >35d: this condition must be carefully considered. Values like this are not always representative of the real XPD of the system but can be due to measurements done in improper measurement conditions. Check all the conditions listed in the note above before your consider the antennas aligned for the XPD performance.

5 Optimize end-end feedhead alignment

This procedure corrects for any minor rotational alignment between antennas at each end.

One antenna is the reference antenna and its feed-head assembly is not adjusted during this procedure.

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> **Note:**
>
> Only check/adjust skew angles on one antenna. If both antennas are adjusted and re-adjusted there is potential for progressive misalignment to occur. Select one antenna as the reference antenna. On long hops and where fading is prevalent there is potential for the V and H plane paths to be affected differently and to therefore exhibit variable cross-polarization discrimination. This alignment procedure must be conducted during periods of known, stable path conditions.

6 **Determine which end of the link provides the reference antenna, and at the opposite end open the Measurement tab-panel of the MPT-HC/HC-HQAM/XP/XP-HQAM for the V and H.**

7 **Adjust the feedhead skew angle of the antenna for maximum XPD on both the V and H link. If the maximums for each are at (slightly) different angles, adjust for a mid-point.**

> **Note:**
>
> Ensure that as you adjust the skew angle, the physical antenna alignment does not shift, which would make it necessary to repeat step 2. Check that antenna mounting bolts and azimuth and elevation adjuster locks have been correctly tightened. The maximum points may be quite sharp, rotate the feedhead slowly to ensure they are not missed.

8 **Check the XPD on the link at the reference end of the link, which should be within 1 to 2 dB of the measurements at the adjusted end.**

9 **On completion ensure feedhead bolts are correctly tightened - check that XPDs do not change during tightening.**

10 **Retain feed-head adjustment data for the commissioning records.**

The procedure is complete.

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MOTOROLA SOLUTIONS

City of Fort Lauderdale

Attachment 24 - Bandwidth Information

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.12.2.6 Bandwidth Information

System Bandwidth

The proposed backhaul solution will feature Adaptive Coding and Modulation, per the RFP's request, which will allow for a maximum throughput of 161 Mbps at 128 QAM during ideal conditions (those lacking abnormal fading). The sample path profile analysis document is attached in section 3.12.2.3.

The table below shows preliminary bandwidth calculations for the system. The bandwidth shown does not include future use, expansion, or optional system requirements.

Table: Preliminary Bandwidth Calculations

Site	Bandwidth
State of Florida Core Site	10 Mbps
Utilities DSR Core Site	10 Mbps
State of Florida Prime Site	10 Mbps
Utilities GeoPrime Site	10 Mbps
State of Florida Subsite	2 Mbps
Utilities Subsite	2 Mbps
Point of America Subsite	2 Mbps
Playa del Sol Subsite	2 Mbps
W. Cypress Creek Road Dispatch	5 Mbps
Executive Airport Way Dispatch	5 Mbps
1300 Broward (Primary Dispatch	5 Mbps
System Totals	
Initial Fort Lauderdale P25 System Bandwidth Requirements	58 Mbps

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Proposed Available	161 Mbps
Additional Bandwidth (Available)	103 Mbps

It should be noted that the microwave system is a closed network, and any bandwidth used outside of the RNI must be allocated through the customer's CEN. Once these requirements are defined, Motorola will work with the city of Fort Lauderdale to quote the necessary interfaces required to implement additional bandwidth allocations.

Bandwidth per Hop

REFER TO COMPETITIVE NEGOTIATIONS TERM SHEET

Motorola Solutions, in partnership with Infinity Technology Solutions, is proposing a microwave backhaul solution for Fort Lauderdale that will provide a guaranteed throughput of 161 Mbps at 128 QAM.

2200 Executive Way (Fort Lauderdale Backup Dispatch) to Playa del Sol												
Modulation	**TX Power (dBm)**		**RX Threshold Level (dBm)**		**EIRP (dBm)**		**Receive Signal (dBm)**		**Thermal Fade Margin (dB)**		**Flat Fade Margin - multipath (dB)**	
128 161	28	28	-70.1	-70.1	62.97	62.9	-28.79	-28.79	41.31	41.31	41.31	41.31
64 136	28	28	-73	-73	62.97	62.9	-28.79	-28.79	44.21	44.21	44.21	44.21
32 114	28	28	-74.9	-74.9	62.97	62.9	-28.79	-28.79	46.11	46.11	46.11	46.11
16 90	28	28	-78.8	-78.8	62.97	62.9	-28.79	-28.79	50.01	50.01	50.01	50.01
4 43	28	28	-90	-90	62.97	62.9	-28.79	-28.79	61.21	61.21	61.21	61.21

2200 Executive Way (Backup Dispatch) to Utilities												
Modulation	**TX Power (dBm)**		**RX Threshold Level (dBm)**		**EIRP (dBm)**		**Receive Signal (dBm)**		**Thermal Fade Margin (dB)**		**Flat Fade Margin - multipath (dB)**	
128 161	32.5	32.5	-69.6	-69.6	61.22	65.2	-29.51	-29.51	40.09	40.09	40.09	40.09
64 136	32.5	32.5	-72.5	-72.5	61.22	65.2	-29.51	-29.51	42.99	42.99	42.99	42.99
32 114	32.5	32.5	-74.4	-74.4	61.22	65.2	-29.51	-29.51	44.89	44.89	44.89	44.89
16 90	32.5	32.5	-78.3	-78.3	61.22	65.2	-29.51	-29.51	48.79	48.79	48.79	48.79
4 43	32.5	32.5	-89.5	-89.5	61.22	65.2	-29.51	-29.51	59.99	59.99	59.99	59.99

Utilities to Point of America												
Modulation	**TX Power (dBm)**		**RX Threshold Level (dBm)**		**EIRP (dBm)**		**Receive Signal (dBm)**		**Thermal Fade Margin (dB)**		**Flat Fade Margin - multipath (dB)**	
128 161	31	31	-70.1	-70.1	65.32	65.9	-28.4	-28.4	41.7	41.7	41.7	41.7

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64 136	31	31	-73	-73	65.32	65.9	-28.4	-28.4	44.6	44.6	44.6	44.6
32 114	31	31	-74.9	-74.9	65.32	65.9	-28.4	-28.4	46.5	46.5	46.5	46.5
16 90	31	31	-78.8	-78.8	65.32	65.9	-28.4	-28.4	50.4	50.4	50.4	50.4
4 43	31	31	-90	-90	65.32	65.9	-28.4	-28.4	61.6	61.6	61.6	61.6

Point of America to State of Florida												
Modulation	**TX Power (dBm)**		**RX Threshold Level (dBm)**		**EIRP (dBm)**		**Receive Signal (dBm)**		**Thermal Fade Margin (dB)**		**Flat Fade Margin - multipath (dB)**	
128 161	28.5	28.5	-70.1	-70.1	62.53	63.4	-28.11	-28.11	41.99	41.99	41.99	41.99
64 136	28.5	28.5	-73	-73	62.53	63.4	-28.11	-28.11	44.89	44.89	44.89	44.89
32 114	28.5	28.5	-74.9	-74.9	62.53	63.4	-28.11	-28.11	46.79	46.79	46.79	46.79
16 90	28.5	28.5	-78.8	-78.8	62.53	63.4	-28.11	-28.11	50.69	50.69	50.69	50.69
4 43	28.5	28.5	-90	-90	62.53	63.4	-28.11	-28.11	61.89	61.89	61.89	61.89

State of Florida to 1300 Broward (Primary Dispatch)												
Modulation	**TX Power (dBm)**		**RX Threshold Level (dBm)**		**EIRP (dBm)**		**Receive Signal (dBm)**		**Thermal Fade Margin (dB)**		**Flat Fade Margin - multipath (dB)**	
128 161	25	25	-69.6	-69.6	54.79	58.62	-28.16	-28.16	41.44	41.44	41.44	41.44
64 136	25	25	-72.5	-72.5	54.79	58.62	-28.16	-28.16	44.34	44.34	44.34	44.34
32 114	25	25	-74.4	-74.4	54.79	58.62	-28.16	-28.16	46.24	46.24	46.24	46.24
16 90	25	25	-78.3	-78.3	54.79	58.62	-28.16	-28.16	50.14	50.14	50.14	50.14
4 43	25	25	-89.5	-89.5	54.79	58.62	-28.16	-28.16	61.34	61.34	61.34	61.34

1300 Broward (Primary Dispatch) to Playa del Sol												
Modulation	**TX Power (dBm)**		**RX Threshold Level (dBm)**		**EIRP (dBm)**		**Receive Signal (dBm)**		**Thermal Fade Margin (dB)**		**Flat Fade Margin - multipath (dB)**	
128 161	30	30	-70.1	-70.1	65.62	64.9	-26.13	-26.13	43.97	43.97	43.97	43.97
64 136	30	30	-73	-73	65.62	64.9	-26.13	-26.13	46.87	46.87	46.87	46.87
32 114	30	30	-74.9	-74.9	65.62	64.9	-26.13	-26.13	48.77	48.77	48.77	48.77
16 90	30	30	-78.8	-78.8	65.62	64.9	-26.13	-26.13	52.67	52.67	52.67	52.67
4 43	30	30	-90	-90	65.62	64.9	-26.13	-26.13	63.87	63.87	63.87	63.87

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City of Fort Lauderdale

Attachment 25 - Self-Testing and Diagnosis Documentation

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.21.5.2.B1 Self-Testing and Diagnosis Documentation

Dispatch Console System Fault Management

Hardware Element Monitoring

The radio system's fault manager known as the Unified Element Manager (UEM) monitors and reports the status of all the hardware elements in the console sub-system. This allows the console sub-system to be fault managed from the same point at which the rest of the radio system is fault managed.

The specific hardware elements which are monitored are the dispatch position, the archiving interface server and any networking equipment which supports the console elements. Each of these hardware elements monitors critical internal hardware sub-elements and reports its status. This allows a failure within a hardware element to be detected. The hardware elements in the console sub-system are also periodically polled to request their status. This allows a failure of an entire hardware element to be detected.

Software Process Monitoring

The console sub-system monitors and reports the status of all the critical software processes running on the various hardware elements which comprise the sub-system. Changes in the status of software processes on a device are recorded internally. These internal records are primarily intended for use by qualified technical personnel in troubleshooting problems with the console sub-system. Status changes which are useful for understanding the console sub-system's overall status are also reported to the radio system's fault manager (UEM).

If a failure of a software process is detected, self-healing actions may be initiated to correct the failed process. Refer to the Self-Healing Actions feature for more information.

Network Link Integrity Monitoring

The network elements which are used by the console sub-system are monitored in the same manner as the network elements for the rest of the radio system. Any failures in these links are reported to the radio system's fault manager (UEM).

Automatic Discovery of Console Elements

The console sub-system supports the automatic discovery of console elements by the radio system's fault manager (UEM). This saves the user from having to manually gather and enter the necessary data into the radio system fault manager.

The radio system fault manager automatically discovers all network elements (both Motorola manufactured elements and Motorola supported third party elements) that are included in the system and adds them to the map of network elements in a topologically descriptive manner.

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Outputting of Monitoring Results (SNMP)

The console sub-system supports the reporting of fault status to the radio system's network manager (UEM) via the SNMP protocol.

Self-Healing Actions

The console sub-system automatically takes certain actions to try to remedy failures detected by its fault management routines. These actions are intended to provide as much functionality to the user as possible.

These actions include restarting failed software processes, resetting internal hardware or reloading software into internal hardware.

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City of Fort Lauderdale

Attachment 26 - Distribution of Diagnostics

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.21.5.B2 Distribution of Diagnostics

Diagnostic capability shall be distributed among independent and redundant subsystems and shall not rely on one central diagnostic circuit.

Motorola's dispatch console subsystem uses a distributed architecture and does not rely upon any one central component for mission critical operations or diagnostics. Motorola does not use a centralized server architecture for its console operations. Rather, console voice and call processing takes place locally at each dispatch console within the computer motherboard integrated into the CommandCentral Hub. This means that a failure of console processing will only affect that single, local console and will not spread to other consoles. Network equipment, specifically the LAN switches and site routers, are deployed in pairs at each dispatch console site.

Dual-NIC (Dual Network Interface Card) architecture of the console positions ensures that each console position is connected to two LAN switches so that either LAN switch can fail without affecting operations at any console. In turn, the dual LAN Switches are connected to dual Site Routers. Site Routers, in turn, connect into a fault-tolerant MPLS Router, with dual power feed and duplicated Control Switch Modules. Each of these components is monitored by the Unified Element Manager (UEM) system using SNMP protocol. The UEM application itself is duplicated between the virtual machine known as VMS02 in the Zone Core and VMS10 in the Backup Zone Core.

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Attachment 28 - Power Supply/Backup Power - UPS Documentation

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.21.7.1.G Power Supply/Backup Power – UPS Documentation

CyberPower

EC850LCD
ECOLOGIC UPS

Offering advanced energy-saving battery backup and surge protection against power surges and interruptions.

A compact UPS with standby topology, the CyberPower Ecologic EC850LCD provides battery backup (using simulated sine wave output) and surge protection for desktop computers, workstations, networking devices, and home entertainment systems.

During power interruptions, the EC850LCD offers reliable power protection and battery backup. When the battery backup detects that the computer is off or in sleep mode, computer peripherals connected to the ECO Mode, surge protected outlets will be automatically turned off, reducing power usage and lowering energy costs (USB connection required). The multifunction LCD provides immediate, detailed information about the UPS battery and power conditions and generates alerts of potential problems before they can affect critical equipment and cause downtime.

The EC850LCD comes with a three-year warranty (including coverage of batteries) and a $100,000 Connected Equipment Guarantee.



TYPICAL APPLICATIONS
- Desktop Computers
- Workstations
- Personal Electronics
- Home Networking/VoIP

FEATURES
- 850VA / 510W
- Standby Topology
- Selectable ECO Technology
- GreenPower UPS™ Technology
- Full-time Surge Protection and Battery Backup
- Multifunction LCD
- Compact Form Factor
- 12 Outlets
- PowerPanel® Personal
- 3-Year Warranty

SPECIFICATIONS

GENERAL	
UPS Topology	Standby
Energy Saving	GreenPower UPS™ High Efficiency
ENERGY STAR® Certified	Yes

INPUT	
Frequency	47Hz - 63Hz
Plug Type	NEMA 5-15P
Plug Style	Right Angle - 45° Offset
Cord Length	5 ft.

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EC850LCD
ECOLOGIC UPS



SPECIFICATIONS - CONT.

OUTPUT	
VA	850
Watts	510
On Battery Voltage	120Vac +/- 5%
On Battery Frequency	50/60Hz +/- 1% (auto-sensing)
On Battery Waveform	Simulated Sine Wave
Outlets - Total	12
Outlet Type	NEMA 5-15R
Outlets - Eco Controlled	3
Outlets - Battery & Surge Protected	6
Outlets - Surge-Only Protected	6
Outlets - Widely Spaced	4
Overload Protection	Internal circuitry limiting circuit breaker
Transfer Time	4ms
BATTERY	
Runtime at Half Load (min)	7.9
Runtime at Full Load (min)	2.3
Battery Type	Sealed Lead-Acid
Field-serviceable Battery	Replaceable by qualified technician
Typical Recharge Time	8 Hours
SURGE PROTECTION & FILTERING	
Surge Suppression	526 Joules
EMI/RFI Filtration	Yes

MANAGEMENT & COMMUNICATIONS	
HID Compliant USB Port	Yes
Management Cable	USB Cable
LED Indicators	Power On, ECO on/off
Audible Alarms	Battery Mode, On Battery, Low Battery, Overload
Software	PowerPanel® Personal
PHYSICAL	
Form Factor	Compact
Keyhole Mounting Slots	Yes
Dimensions (WxHxD) (in.)	12.2 x 3.1 x 7 in.
Weight (lbs.)	7.7
ENVIRONMENTAL	
Operating Temperature	32°F to 104°F / 0°C to 40°C
Operating Relative Humidity	0% - 90% non-condensing
Operating Elevation	0-10,000 feet (0-3000 meters)
Storage Temperature	5°F to 113°F / -15°C to 45 °C
Storage Relative Humidity	0% - 95% non-condensing
Storage Elevation	0-50,000 feet (0-15,000 meters)
CERTIFICATIONS	
Safety	UL1778, cUL 107.3, FCC DOC Class B
Environmental	RoHS Compliant
WARRANTY	
Product Warranty	3 Years
Connected Equipment Guarantee	Lifetime
CEG Amount	$100,000

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MOTOROLA SOLUTIONS

City of Fort Lauderdale

Attachment 30 - Flat Panel Display Documentation

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.21.8 Flat Panel Display Documentation



24" Evolution Multi-Touch LED Touch Screen

Touch Screen Performance (Evolution-Touch)
- Superior High-Performance Projected Capacitive (Unlimited Touch Activations)
- 10 Point Multi-Touch (Finger, Capacitive Stylus, Nitrile, Latex and Vinyl Gloves)
- USB HID compliant & Driver free with no calibration
- Ultra Fast Precision Touch Response
- Requires human intentional touch (HIT)
- Anti-Fingerprint Oleophobic nano-coating
- Anti-Glare Diffuses mirror-like reflection
- Noise Immunity (Advanced technology to eliminate wide band and narrow band interference)
- 3mm thick, sealed full glass display
- Windows 8 (Swipe Zone)
- Multiple monitor supported (W8)
- Touch operation is unaffected by surface contaminants

Display Performance
- Medical "A" Grade LCD Panel/ 16:9
- Edge-to-Edge sealed 3mm glass surface
- Integrated Multi-Media Speakers
- Industrial Cooling
- America's Best Commercial Warranty 4 Years with advanced replacement
- Proprietary CFD Designed Ventilation
- Custom vent system to limit dust collection and prevent fluid intrusion
- (MTBF) 124,000 Hours
- HDMI (HDCP Compatible) input provides expanded connectivity with advanced technology
- VESA compliant
- Locking power supply connection
- Made in the USA

Applications
- Mission Critical
- Industrial
- Nurse Stations
- ERP
- Retail

Certifications
- 60601-1
- IPX2
- IP34

Designed and Manufactured by Tech Global, Inc. in Chicago, IL

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SPECIFICATIONS

Touch Interface	Evolution-Touch (PCT/ Anti-Fingerprint/ Anti-Glare): USB/ HID Compliant
Touch Response	5ms
Display	24/7 Medical "A" Grade Display/ Edge-Lit LED LCD
Viewable Image Size	24"/ 16:9
Mean Time Between Failure (MTBF)	124,000 Hours
Pixel Pitch	0.25mm
Pixels Per Inch	102 @ native resolution
Brightness	250 cd/m2
Contrast Ratio	3000:1
Viewing Angle	178° Vert., 178° Hor.
Response Time	LCD Rapid Response (25ms)
Synchronization Range	
Horizontal	31.5 kHz to 81.1 kHz (Analog/Digital)
Vertical	56 to 76 Hz
Internal Speakers	Built-in multimedia speakers provide quality sound
Input Signal	
Video	ANALOG 0.7 Vp-p/75 Ohms
Sync	TTL Level (Positive/Negative)
Input Connectors	DisplayPort, HDMI and DVI
Native Resolution	1920 x 1080 HD @ 60 Hz
Power Consumption	
On	18W/ Power Savings Mode .35W/
Dimensions (WxHxD)	
Net (with stand)	23.5 x 14.4 x 8.1 in.
Net (without stand)	23.5 x 14.4 x 1.64 in.
Net Weight (with stand)	17 lbs.
VESA Hole Configuration Specification	100 x 100mm
Environmental Conditions	
Operating Temperature	5-35C/41-95F
Operating Humidity	20-80%
Operating Altitude	2000m / 6562 ft.
Storage Temperature	-10-60C/14-140F
Storage Humidity	10-85%
Storage Altitude	12,192m/40,000 ft.
Warranty	4 years parts and labor including backlight and touch components

TechGlobal

Inc. 5000

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City of Fort Lauderdale

Attachment 30 - Headset Jack Documentation

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.21.9 Headset Jack Documentation

HEADSET JACK BOX B1913

The headset jack box allows a dispatcher to use a headset while operating the dispatch position. The headset jack supports headsets which use either PJ7 (6-wire) or PJ327 (4-wire) longframe connectors. (6-wire headsets have a PTT button while 4-wire headsets do not have a PTT button.) The headset jacks ship from the factory configured for 6-wire headsets but can be reconfigured for 4-wire headsets in the field.

The headset jack contains two volume controls; one for adjusting the level of received radio audio and one for adjusting the level of received telephone audio. A small dimple is molded into the headset jack housing near the telephone volume control so the dispatcher can tell them apart without having to look at them.

The headset jack may be mounted either underneath a writing surface or on top of a writing surface. It is designed with a low profile and rounded edges to minimize "knee banging" when mounted underneath a writing surface.

HEADSET JACK BOX SPECIFICATIONS	
Frequency Response	300 - 3400 Hz
Total Harmonic Distortion	<1.0%
Dimensions (H x W x D)	1.6 x 5 x 6 inches 41 x 127 x 152 mm
Weight	1.2 lbs (0.5 kg)
Cable Length	12 feet (3.7 m) total length 6 feet (1.8 m) for permanently attached cable 6 feet (1.8 m) for extension cable
Power Consumption	<< 1 Watt
Thermal Output	< 1 BTU/Hr
Operating Temperature	50°F to 86°F 10°C to 30°C
Storage Temperature	50°F to 86°F 10°C to 30°C
Relative Humidity Operating	0% - 90% relative humidity at 30°C non-condensing



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Attachment 31 - Footswitch Documentation

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.21.10 Footswitch Documentation

FOOTSWITCH DSTWIN6328A

The footswitch provides two separate foot pedals for controlling functions on your radio dispatch position. Typically, one pedal controls the general transmit function while the other pedal controls the monitor (disable CTCSS) function.

Each pedal controls its own single pole, double throw (Form C) switch with the common and normally open terminals of each switch connected to the footswitch cable. The free end of the cable terminates in a RJ45 connector.

The footswitch is built with quality heavy cast iron construction and provides a non-skid base pad minimizing the chance of a missed transmission. With four screw holes you can permanently install the footswitch or keep it mobile.

FOOTSWITCH SPECIFICATIONS	
Dimensions (H x W x D)	1.8 x 8.4 x 4.6 inches 45.72 x 213.36 x 116.84 mm
Weight	5.0 lbs (2.3 kg)
Cable Length	10 feet 3.0 m
Operating Temperature	-20°F to 140°F -29°C to 60°C
Storage Temperature	-20°F to 140°F -29°C to 60°C
Relative Humidity Operating	0% - 90% relative humidity at 60°C non-condensing



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City of Fort Lauderdale

Attachment 32 - Master Time Source Documentation

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.21.11 Master Time Source Documentation



-SecureSync 2406-013

SecureSync 2400 Time & Frequency synchronization system with 6 expansion slots for option cards, single fixed AC power supply, OCXO oscillator, and L1 GNSS reference. Includes a SMA to N-type conversion RF cable, front panel mounting ears, quick start guide and US power cord. Includes (2) Gbe Network ports, 1PPS, 10Mhz, HD-15 Configurable I/O and Multi-Signal Configurable BNC.

- ***Option Card 1204-49 - 2 GbE ports with NTP (installed)***
- ***Option Card 1204-0F - 3 Dry Contact Alarm relay outputs (installed)***
- ***8230 GNSS L1 outdoor antenna***
- ***8226 GPS Surge protector and grounding kit***
- ***Breakout cable for SecureSync 2400, supporting NetClock/NENA interfaces***

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City of Fort Lauderdale

Attachment 33 - Telecommunicator Headset Documentation

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.21.12 Telecommunicator Headset Documentation

NOTE: The RFP asks us to furnish this documentation but states that Poly CA22CD-SC headsets “are currently in use by the Customer and are required to operate with the new dispatch consoles.” We have interpreted this to mean that no headsets need to be included with our proposal.

The documentation provided below is for the Motorola Solutions Certified headsets that are compatible with our consoles, however none have been included with this proposal as requested by the RFP.

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PLANTRONICS HEADSETS

The Plantronics EncorePro 510 and EncorePro 520 headsets are certified for use with dispatch consoles from Motorola Solutions. These headsets provide all day comfort with soft ear cushions, superior noise-cancelling for clearer calls, and increased reliability so conversations can continue without worry. The flexible microphone provides both visual and tactical positioning guides for precise positioning resulting in clearer conversations. These headsets meet OSHA standards for work regulations. You can use headsets not certified by Motorola Solutions but we cannot guarantee their performance.

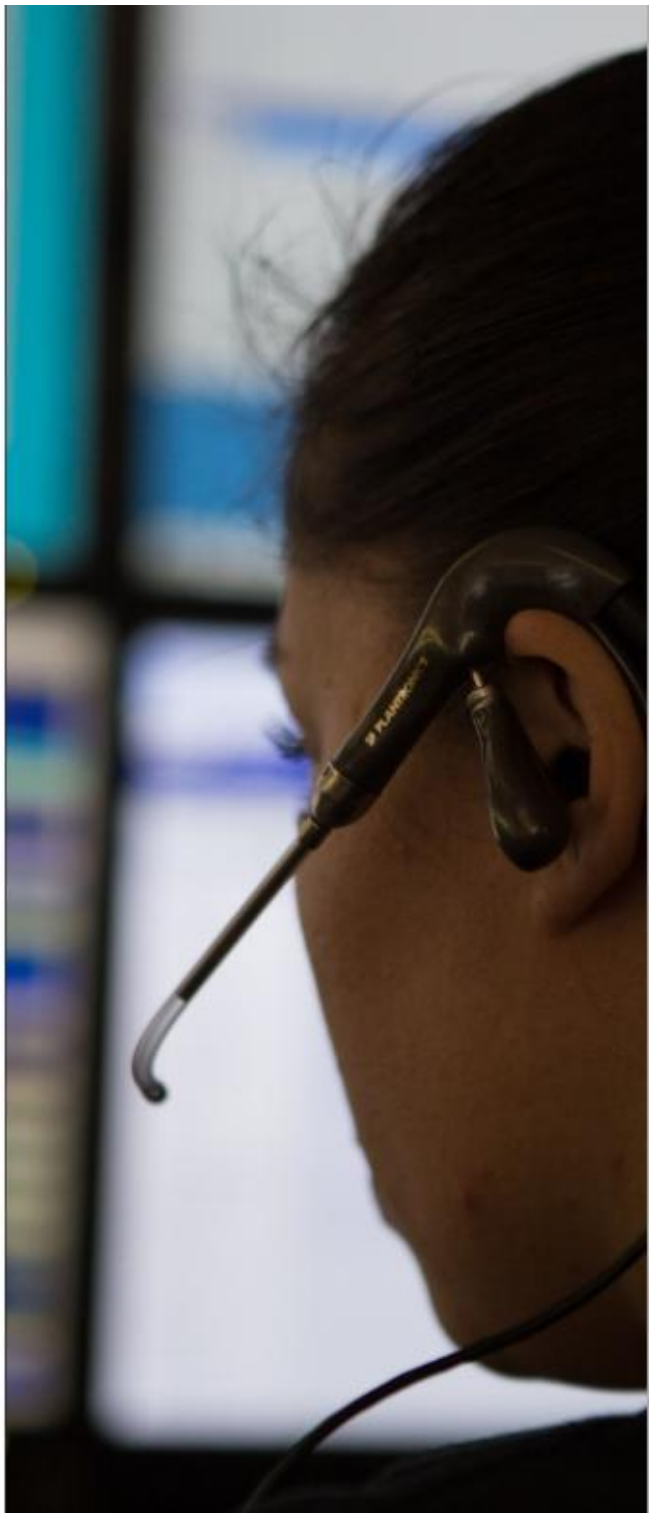
For more information about these products is available at
https://www.plantronics.com/us/en/product/encorepro-510-520



EncorePro 510



EncorePro 520



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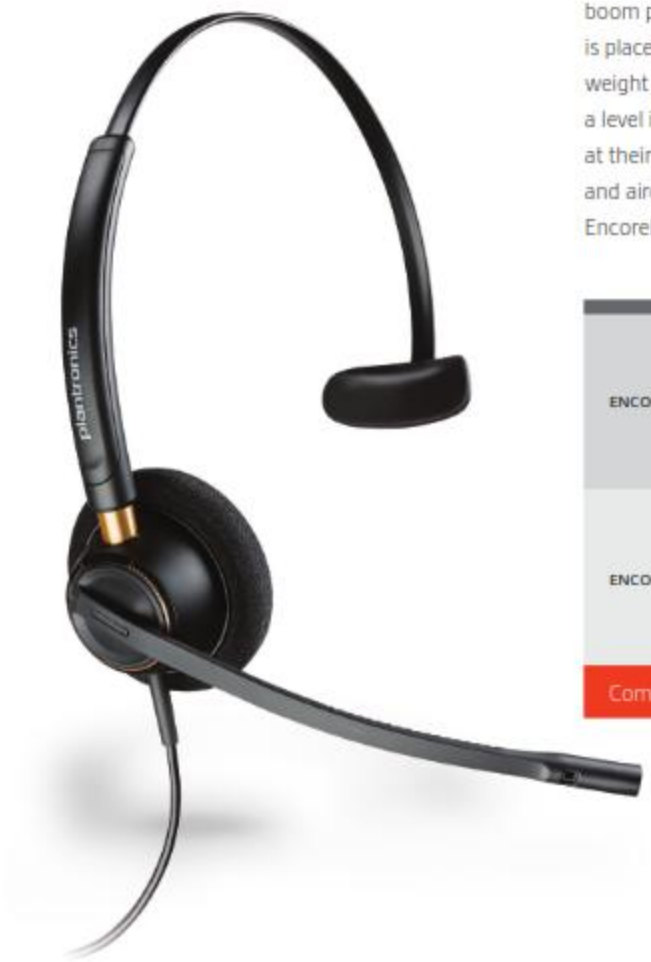
plantronics.

ENCOREPRO 510/520

Designed to exceed expectations

Feel the difference with the EncorePro. Our all-new over-the-head headset incorporates a range of leading design features to enhance the performance of your customer service representatives.

The sophisticated new design offers visual and tactile boom positioning feedback, ensuring the microphone is placed correctly for the clearest conversations. Lighter weight and softer, more luxurious ear cushions create a level in comfort for staff who need to be performing at their peak all day, every day. And with laser welding and aircraft-grade aluminum, this is the most durable EncorePro yet.





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plantronics.

ENCOREPRO 510/520



HIGHLIGHTS

- Laser welding and aircraft-grade aluminum for greater reliability
- Precise visual and tactile feedback on mic positioning
- Next-generation noise-canceling microphone
- Soft, luxurious ear cushions for all-day comfort
- Voice-tube versions also available

AUDIO PROCESSORS

VISTA M22



DA80



Performance by design

KEY FEATURES

- Our lightest dedicated over-the-head model ever
- Next-generation custom microphone reduces background noise and interference, ensuring fewer missed words and a better caller experience
- Tactile and visual guidance mean the user can feel and hear ratchet clicks when the boom is moved into the proper range for optimum mic positioning
- Tuned wideband audio delivers richer, clearer conversations while SoundGuard technology protects user from noise spikes and listening fatigue
- Metals employed structurally, not cosmetically, at key joints
- Unibody flexible boom and laser welding ensure maximum robustness
- Quick Disconnect (QD) feature provides walkaway convenience and compatibility with all Plantronics USB and deskphone audio processors and direct connect cables

EncorePro headsets require a Plantronics audio processor or direct connect cable to connect to phone, or USB audio processor to connect to computer.

VISTA M22 AUDIO PROCESSOR

The Vista M22 audio processor delivers precise levels of listening comfort, sophisticated hearing protection, and superior audio performance. The Vista M22 includes Clearline audio to improve call quality in any environment, especially wideband VoIP.

DA80 USB AUDIO PROCESSOR

Compatible with all Plantronics QD-equipped headsets, the Plantronics DA80 is a high-performance USB audio processor with high-quality audio and one-touch call, volume and mute controls. The DA80 also helps you meet OSHA/Noise at Work regulations.

Connects to	PC or deskphone with Plantronics audio processors and cables
Ideal for	Telephone-intensive users, including formal customer care centers, help desks, telesales, and customer service organizations
Hearing protection	SoundGuard technology: acoustic limiting for protection against sounds above 118 dBA
Audio performance	Wideband audio (up to 6,800 Hz), noise-canceling microphone
Limited warranty	Two years

Headset	Model	Weight
HW510	Over-the-head, Monaural, Noise-canceling	52g
HW510V	Over-the-head, Monaural, Voice-tube	50g
HW520	Over-the-head, Binaural, Noise-canceling	74g
HW520V	Over-the-head, Binaural, Voice-tube	72g

For more information about the EncorePro 510/520 or other products, please visit our Web site at plantronics.com.

GLOBAL CUSTOMER CARE

Backed by Plantronics industry-leading global service and support.
+1-800-544-4660 (US and Canada)
+1-831-458-7700 (outside US)

2 YEAR WARRANTY

Connect with Plantronics

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City of Fort Lauderdale

Attachment 34 - Fallback Control Station Documentation

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.22.1 Fallback Control Station Documentation

Backup Control Stations – APX Consolette

Motorola has included APX Consolette control stations at the Dispatch Sites, configured as follows per the City's requirements:

- Six (6) 700/800 MHz APX Consolettes (one per dispatch position) at 1515 West Cypress Creek Road dispatch site.
- Eight (8) 700/800 MHz APX Consolettes (one per dispatch position) at 2200 Executive Airport Way dispatch site.

At both locations, an 8-port Control Station Combiner has been included in our proposal, along with a pair of coaxial lines and 3 dBd gain control station antennas per location, intended for roof mounting. These locations were not available for visit during the RFP site walks. The proposal was prepared with the assumption of coaxial cable runs not exceeding 300 ft at 1515 West Cypress Creek Road and 200 ft at 2200 Executive Airport Way.



Figure: APX Consolette

The APX Consolette provides a low-cost, mid-power wireless dispatch solution as an ideal complement to a modern P25 dispatch center. Equipped with leading edge P25 technology, the APX Consolette can be used as an emergency backup station when infrastructure is offline, or for wireless access to different system types for increased interoperability between agencies.

The APX Consolette's P25 operation and compatibility with legacy systems ensures that communications are clear, continuous, and coordinated across multiple users, agencies, and systems. The durable robust metal housing provides durability and allows for easy servicing, while the integrated front panel numeric keypad allows fast access to radio controls.

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MOTOROLA SOLUTIONS

City of Fort Lauderdale

Attachment 38 - Logging Recorder Documentation

RFP # 549

December 18, 2025

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Motorola Solutions

Section 1

RFP Section 3.24.2.1 Logging Recorder Documentation

Eventide®

NexLog™ DX SERIES™

Advanced Recording Solutions
for Mission-Critical Communications



Recording Systems • Software Solutions • Smart Gateways

NG9-1-1 • P25 Radio • DMR • IP Dispatch • ATC/ATM
Incident Reconstruction • Instant Recall • Mobile
Quality Assessment • Screen Recording • Reporting
VoIP • SIP • Digital • Analog • T1/E1 • ISDN • ED-137B/C

Eventide's mission-critical recording solutions are trusted by organizations worldwide to capture, secure and reconstruct their most important interactions.

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NexLog DX-Series Communications Recording Software and Solutions

NexLog DX-Series™ recording solutions are the culmination of over 30 years of mission-critical recording experience. The DX-Series continues the NexLog tradition of reliability and ease-of-use while focusing on Digital Transformation (DX) to meet tomorrow's needs. With expanded solution architectures, as well as enhanced security, scalability and integrations, the NexLog DX-Series is truly the next generation recorder.

The NexLog DX-Series software includes multi-tier security and a web-based configuration management tool, as well as support for password policies, Active Directory, SNMP, TLS and AES-256 encryption.

The innovative *NexLog Access Bridge* option enables a scalable approach to enterprise deployments. Multiple recorders can be linked together for unified searching, replay, incident management and configuration.

NexLog 740 DX-Series™ Recording Solution



Channel Capacity*: 96 Analog, 96 Digital PBX, 192 T1, 240 E1, 560 VoIP, 240+ P25, 240+ DMR
3U Rack-Mountable

NexLog 840 DX-Series™ Recording Solution



Channel Capacity*: 240 Analog, 240 Digital PBX, 240 T1, 240 E1, 560 VoIP, 240+ P25, 240+ DMR
4U Rack-Mountable

DX-Series Smart Gateways™



Captures, Buffers and Transfers to DX-Series Recording Solutions
Up to 24 Analog, 24 Digital, 48 T1, 60 E1 or 120 VoIP Channels. 1U

NexLog DX-Series™ Virtual Recording Solution



Channel Capacity*: 560 VoIP, 240+ P25. Add ***DX-Series Smart Gateways*** for Analog, Digital or Remote VoIP. Works with **ESXi**

MediaWorks DX Software: Incident Reconstruction, Instant Recall and More!

The ***MediaWorks DX*** ™ software option provides secure access, replay and management of audio, screen, multimedia, text and TDD recordings. It is available via web browser on PCs, tablets and phones (using secure HTML5 technology) or as a native application on a PC. MediaWorks DX provides a complete set of tools to Browse, Search, Replay, Instant Recall, Live Monitor, Reconstruct Incidents, Protect, Export and much more.



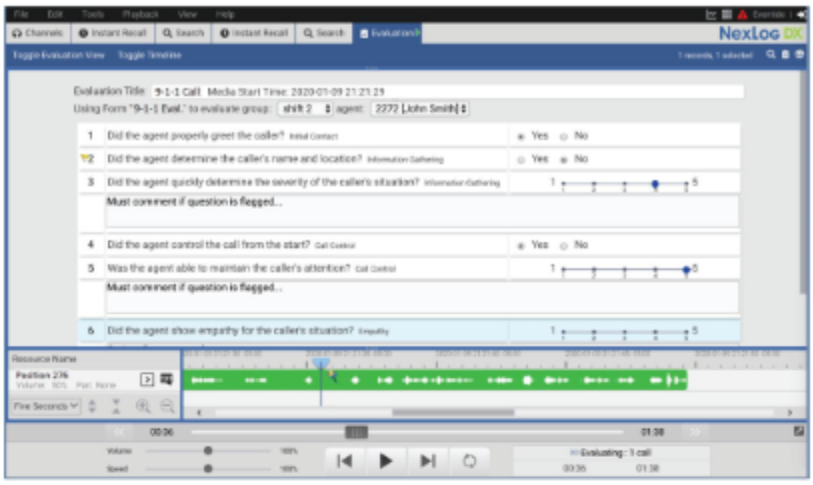
Capabilities include: Graphical Time-Line • Waveform Display • Talking Time and Date • Zoom In/Out • Loop Playback Skip Forward/Back • Playback AGC • Pitch-Corrected Variable Speed • Redact Audio • Obfuscate Audio • Audio Annotation • Text Annotation • Screen Replay • Text/SMS Replay • Multimedia Replay • Call Notes • Lock Recordings Protect Calls • Quarantine Recordings • Pop-Out Search Tools • Geo-Fence Search • Speech Search • Location Display** Location Tracking** • Multi-Parameter Search • Create Incident • Modify Incident • Attach Other Media • Split/Join Audio Clips • Restrict Access • Share Incident Folder • Pre-Set Exports • Menu Driven Export • Incident Export • Single and Multi-Recording Export • Export with Secure Standalone Player • Phone and Tablet Support • Multiple Monitor Support Configurable Layout • Dark Mode • Touch Screen Support • Accessibility Modes • Two Factor Authentication • Auditing

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Quality Factor DX Software: Integrated Quality Assessment and Reporting

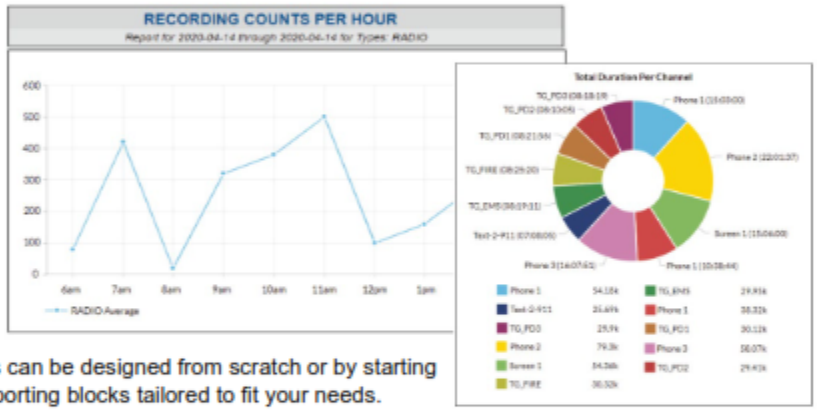
The *Quality Factor DX* ™ software option facilitates a quality assurance program to fit your agency's needs. With its built-in APCO/NENA QA/QI evaluation forms, you can quickly start measuring agent performance and help to protect your center from unwarranted conformance questions.

Quality Factor DX software includes a wide range of options for scoring, comments, notifications, scheduling, and reporting that can be selected to fit any agency. Add the optional *Screen Recording DX* software to get the complete picture via synchronized voice and screen replay.



Reporting Engine DX

The flexible *Reporting Engine DX* ™ option provides directors and managers with business intelligence to help determine necessary staffing levels and workflows, and to help justify budgets. Radio traffic, 9-1-1 and administrative phone activity can all be joined into actionable reports.



Reports can be generated on a schedule and delivered via email, PDF, or viewed in a browser. Custom reports can be designed from scratch or by starting from a wide range of pre-configured reporting blocks tailored to fit your needs.

Screen Recording DX

The *Screen Recording DX* ™ option allows you to capture high-quality videos of workstation activity that can be seamlessly synchronized with recorder audio. Supervisors can benefit by obtaining a better understanding of each agent's compliance with required practices and protocols. *Screen Recording DX* can capture the important imagery appearing on a user's PC screen, such as surveillance camera video, maps, or overlay application video. Screen recording replay can also aid during incident investigations and can help to document issues with other software.

The *Screen Recording DX* software can efficiently capture up to 20 frames per second, offers flexible bandwidth-limiting options, supports multiple displays and is compatible with modern Windows and Linux workstations.

NexLog DX-Series Software Update Subscription (DXSUS)

The NexLog DX-Series software continues to evolve in order to meet tomorrow's technical and security challenges, and new software versions and updates are produced on a regular basis. The *DX-Series Software Update Subscription* (***DXSUS*** ™) provides access to these important software versions and updates, which can incorporate Linux security updates, application-level security updates, and improvements to existing functionality. Each NexLog DX-Series software version is conveniently designated by its year of release, as well as its update level (example: "Version 2020.1").

The first 12 Months of ***DXSUS*** coverage is included at no charge with the purchase of each DX-Series recorder, virtual recording solution or DX-Series Smart Gateway product. *Yearly renewals of coverage will help assure that your NexLog DX-Series products maintain the highest levels of security, performance, functionality and supportability.*

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NEXLOG DX-SERIES 740 SPECIFICATIONS SUMMARY

Front Panel GUI	Available HDMI high resolution multitouch (or use an external HDMI or SVGA)
Front Panel I/O	USB jack, 1/8-inch line level output, 1/8-inch headphone output
Remote software	Web browser based NexLog DX-Series Configuration Manager Web browser based MediaWorksDX call search, replay, monitor and export. Windows-based remote playback client software (optional)
Operating System	Debian Linux (embedded)
Database	PostgresSQL (embedded)
Call Record Database	Internal relational database with programmable retention
Analog Channel Specs	Compression Rates (Kbits/s): 13.3, 16, 32, 64 Mu-law Frequency Response: 200 to 3400 Hz Signal to Noise: -50dB Crosstalk: -60dB AGC: 24dB Boost Impedance: >10 K ohm Wow and Flutter: < .8 % peak Distortion: <3%
Network	Ethernet 1,000 Mbps (2 standard, up to 8 optional)
RAM	16GB (Standard) up to 64GP (optional)
Archiving Options	NAS, Storage Area Network (SAN), Eventide Central Archive Server(CAS), Single or dual Blu-ray/Multi-drive, USB Flash, USB HDD, Removable 500 GB HDD, Removable 1 TB HDD, RDX drive.
	NexLog DX-Series 740
Height	5 1/2 inches (3U)
Depth	26 inches
Rack Dimensions	5.25"H [134mm] x 19"W [482mm] x 24"D [610mm]
Power Supplies	Dual redundant load sharing - 420 watts
Weight	50-80 pounds
Environmental	Operating Ranges: Standard HDD: +5C (41F) to 40C (104F); Humidity 10-80% relative, non-condensing SSD Option: 0C (32F) to 60C (140F); Humidity 10- 80% relative, non-condensing
Analog channels	8-120
Digital PBX channels	8-120
T1/E1/ISDN PRI channels	24-192
ISDN BRI channels	4-48
VoIP channels	8-560
Maximum hard disk capacity	2 or 4 drives, RAID 1, RAID 5, or RAID 10 (Up to 18TB), Hot Spare options available
Standard archive drive	1 X BluRay Drive (Also support single sided DVD-RAM)
Processor	Intel i5 4-Core (i5-7500T), 2.7 GHz, 6MB Cache

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City of Fort Lauderdale

Attachment 39 - Dispatch Console Supporting Documentation

RFP # 549

December 18, 2025

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Section 1

RFP Section 3.25.3 Console Supporting Documentation

CommandCentral AXS Dispatch Sites

AXS Overview

Motorola Solutions, Inc.'s (Motorola) CommandCentral AXS Dispatch Console reduces the barriers between systems in the City's dispatch centers, allowing access to all the mission-critical tools and applications dispatchers need in the moments that matter. This makes operation more efficient in emergency situations. Resources are accessible with an intuitive, highly configurable browser-based GUI. Dispatchers will have an expansive feature set and a mission-critical IP network for transporting information and calls throughout the system.

CommandCentral AXS improves the efficiency and operation of dispatchers in the following ways:

- **Next Generation Dispatch Experience** – The solution responds to touch, type, or click, giving dispatchers the flexibility to interact and stay connected to teams in the way that best suits them. Extensive configuration options, flexible deployment configurations, and simple scalability means agencies only pay for what is needed now, with the room to adapt and grow as needs change over time.
- **Purpose-Built Dispatch Console Accessories** – Enhances the dispatch experience with accessories, such as gooseneck microphone, speakers, headset jack, and footswitch, designed and tested for industry-leading performance and reliability.

This solution also reduces operating costs and provides a smaller physical footprint in the command center without compromising on features or reliability. This combination of seamless communications, modern architecture, and advanced integration capabilities enables the CommandCentral AXS solution to scale and evolve as needs change over time.

Integration with the ASTRO 25 Network

The proposed dispatch console seamlessly integrates into the City's proposed ASTRO 25 system for an integrated, mission-critical network. This tight union between radio infrastructure and console equipment has several operational benefits to the City of Fort Lauderdale. The physical space to accommodate the proposed console is comparable to that required for a personal computer.

The console can access both trunked talk groups and conventional radio channels over the same network. This architecture reduces overall transport costs and the need for duplicate fixed network equipment.

Connection to ASTRO 25 System

The ASTRO 25 system's architecture is flexible and can be configured to meet the City's unique needs.

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Single Site Link

1. While dual site links are encouraged and preferred, Motorola recognizes that single site links may be used either short-term or longer-term at the dispatch sites nominated for this system. A site gateway will provide an interface that handles the following IP traffic between the dispatch center and the City's ASTRO 25 system's core sites:
   - Network management traffic.
   - Call control and audio traffic for all the calls being handled by the dispatch positions.
   - Aux I/O traffic for the Aux I/Os being handled by the dispatch positions.

The site gateway fragments and prioritizes large IP packets according to industry standards, and converts Ethernet data to the desired transport medium.

Dual Site Link

When dual site links are available, the console site has two logical connections to the core sites, with each connection using a different core router.

Each console site gateway provides an interface that handles and prioritizes the IP traffic (as described above) between the proposed console center and the City's ASTRO 25 core sites.

Redundant connections to the core are provided from the console site LAN switches and the core LAN switches.

LAN Switches

LAN switches provide LAN interfaces for console site equipment and a LAN port for the link to the core site. Service technicians can access the system's configuration manager and service the equipment through the switch.

Advanced Conventional

This capability provides the dispatcher with the ability to control ASTRO 25 conventional channels.

Conventional Base Station Interfaces

The proposed consoles will be able to access and control the City's conventional base stations through the use of Conventional Channel Gateways (CCGW). The console processes audio received from the station and controls various features on compatible stations, such as frequency selection, private line selection, and repeater on/off.

Additionally, the CCGWs allow for recovery of digital signaling, such as unit ID and emergency alarm.

Making Consoles Easy to Operate

Motorola's proposed consoles are optimized for real-time audio, prioritizing emergency calls over other traffic, and minimizing voice queuing. Using robust error mitigation to maintain call quality even when the system is heavily loaded, the proposed console reduces communication errors that may force dispatchers or radio users to repeat their transmissions.

Next Generation Dispatch Experience

CommandCentral AXS features a highly configurable graphical user interface (GUI) that provides quick, single-view access to important information and functionalities. The browser-based GUI's versatile folders, tabs, and scalable resources allow users to organize and configure their dispatch experience

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and make engagement more familiar and intuitive from shift to shift. Folders and tabs can be relocated, exposed, or overlapped as needed, giving dispatchers more control of what information they see and how they interact with those resources. CommandCentral AXS also offers multiple options for routing audio to speakers and controlling volume levels.

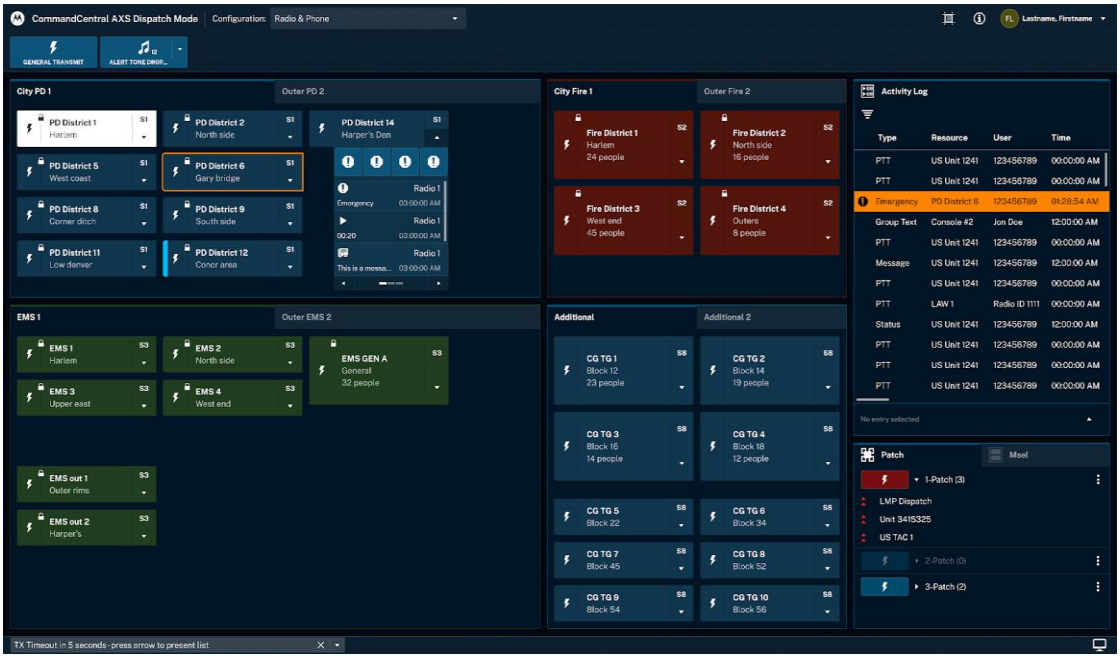


Figure: Next Generation Dispatch Experience

CommandCentral AXS features flexible window positioning and capabilities for quick and efficient access to services such as:

- **Activity Log** – Provides an efficient point of reference for all incoming calls into a dispatch console , showing dispatchers detailed, searchable call information (radio resource name and call time) to enable faster and more informed response.
- **Paging** – Allows users to send user configured pages on radio resources. This flexible paging feature is integrated with CommandCentral AXS for both conventional and trunked radio resources, while an external paging encoder port on the CommandCentral Hub enables third-party paging encoders to send pages on the selected radio resources.
- **Patch Capabilities** – Enables dispatchers to set up a communication path between two or more resources that are normally unable to communicate with each other, such as trunked resources and conventional resources.
- **Alert Tones** – Allows dispatchers to send one of fifteen user-configurable alert tones on selected radio resources. Fifteen default .wav files are provided with the dispatch console software, but any combination of these default files may be replaced with user configured.wav files to meet specific needs.
- **Channel Marker** – Enables dispatchers to send a periodically repeating piece of audio on radio resources to meet the specific needs.

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Motorola Solutions

MOTOROLA SOLUTIONS

City of Fort Lauderdale

Attachment 40 - Shelter Design Documentation

RFP # 549

December 18, 2025

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RFP Section 3.26.1 Shelter Design Documentation 1-1

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Section 1

RFP Section 3.26.1 Shelter Design Documentation

Shelter Design Documentation is provided on the following pages.

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VFP, INCORPORATED
SHELTER MODEL 2506
MOTOROLA STANDARD BUILDING

OVERALL AREA OF THIS BUILDING = 376 SQ FT.
OVERALL HEIGHT OF THIS BUILDING = 130 IN.
THIS BUILDING IS NOT SPRINKLED.
ALL GLAZING TO MEET ANSI 97.1 WITH
CPSC 16 CFR PART 1201 REQUIREMENTS.

Code Classification	Occy	Constr
IBC- INTERNATIONAL BUILDING CODE	S2	VB

SHELTER DESIGN LOADS

uniform floor load	300 psf
uniform roof live load	150 psf
wind load (including sliding and overturning moments)	150 mph
fire rating wall (see Table 7.21.2.1.1 for design reference)	2 hour
seismic zone	CAT "D"
estimated shipping weight	80,000 lbs
min. compressive strength of precast concrete	4000 psi

IBC Code Reference - Per Table 721.2.1.1 -3.6" Min. LW Concrete
Wall Material is Solid Concrete
Item #4-1.1 - Lightweight Concrete 4" Minimum 2 Hour Fire Rating
Door Has a Manufacturer Fire Rating of 1.5 Hours

Field Notes:

a. Allowable stresses calculated using the recommended foundation while anchored with VFP-designated hardware.

b. Uniform floor loading while being lifted is 125 psf.

c. Locate wedge anchor after building is located on foundation to correctly align with installed anchor plate. Refer to detail T, sheet 15.

IBC CODE SECTION 1603 DESIGN LOADS

1.1 FLOOR LIVE LOAD = 300PSF
1.2 ROOF LIVE LOAD = 150PSF
1.3 ROOF SNOW LOAD WITH A GROUND SNOW LOAD OF 100PSF:
- (1) FLAT-ROOF SNOW LOAD = 100PSF
- (2) SNOW EXPOSURE FACTOR = 1.0
- (3) SNOW IMPORTANCE FACTOR = 1.2
- (4) THERMAL FACTOR = 1.0

1.4 WIND LOAD:
- (1) BASIC WIND SPEED = 150MPH
- (2) WIND IMPORTANCE FACTOR = 1.15 & OCCUPANCY CATEGORY = IV
- (3) WIND EXPOSURE = 'C'
- (4) INTERNAL PRESSURE COEFFICIENT = +/- 0.55
- (5) COMPONENTS AND CLADDING = N/A

1.5 EARTHQUAKE DESIGN DATA FOR CONCRETE SHELTERS:
- (1) SEISMIC, IMPORTANCE FACTOR = 1.5 & OCCUPANCY CATEGORY = IV
- (2) MAPPED SPECTRAL RESPONSE ACCELERATIONS, SS = 1.85, S1 = 0.10
- (3) SITE CLASS = 'D'
- (4) SPECTRAL RESPONSE COEFFICIENTS SS = 1.24, SD1 = 0.19
- (5) SEISMIC DESIGN CATEGORY = "D"
- (6) BASIC SEISMIC-FORCE RESISTING SYSTEM = (BEARING WALL SYSTEM W/ INTERMEDIATE PRECAST CONCRETE SHEAR WALLS)
- (7) DESIGN BASE SHEAR
  - (a) 36' = 6.9 KIPS
  - (b) 34' = 6.5 KIPS
  - (c) 32' = 6.2 KIPS
  - (d) 26' = 5.2 KIPS
  - (e) 15' = 3.5 KIPS
- (8) SEISMIC RESPONSE COEFFICIENT, CS = .465
- (9) RESPONSE MODIFICATION FACTOR, R. = 4.0
- (10) ANALYSIS PROCEDURE = EQUIVALENT LATERAL FORCE PROCEDURE

NOTES

1. REFER TO DRAWING 101116 FOR GENERAL NOTES.
2. INSTALL IPGB GROUND AS SHOWN ON SHEETS 10, 11 & 12. REFER TO SHEET 13 FOR GROUNDING DETAILS.
3. FABRICATE TO THE MIRROR IMAGE OF THIS DRAWING WHERE REQUIRED BY ECN, TCN, SALES ORDER, OR NEW DRAWING RELEASE.
4. INSTALL FIRE SUPPRESSIDN SYSTEM WHEN REQUIRED BY SALES ORDER, ECN OR TCN.
5. REFER TO DWG #277034 ON SPECIFIC SET-UP INSTRUCTIONS.
6. REFER TO SHEET NOTES ON SPECIFIC PAGES FOR ADDITIONAL INSTRUCTIONS.
7. THIS BUILDING DOES NOT CONTAIN PLUMBING FACILITIES. PLUMBING FACILITIES SHALL BE PROVIDED ON SITE SUBJECT TO THE LOCAL AUTHORITY HAVING JURISDICTION.

INDEX OF DRAWINGS

Drawing	Description
202506, sheet 1	Title, Allowable Stresses, Revisions Status
202506, sheet 2	One-Line Diagram
202506, sheet 3	Panel Schedules
202506, sheet 4	Alarms/Wiring Diagrams
202506, sheet 5	Generator Wiring
202506, sheet 6	Alarm Terminal Board
202506, sheet 7	Exterior Elevations
202506, sheet 8	Bill of Materials
202506, sheet 9	Interior Layout
202506, sheet 10	Ceiling Layout
202506, sheet 11	Grounding Layout
202506, sheet 12	Grounding Details
202506, sheet 13	* Construction Details
202506, sheet 14	Wiremold Details
202506, sheet 15	* Foundation Details
202506, sheet S1	Roof & Floor Castings
202506, sheet S2	Front & Rear Long Wall Castings
202506, sheet S3	Left & Right Short Wall Castings
	General Notes
101116	
101562	Fastening Schedule
277034	* Set-Up Instructions

* Indicates drawing containing work to be done in the field.

REVISION STATUS OF SHEETS

G	G																REVISION	WGE MIRROR OPTION
S3bm	S2bm																SHEET	
G	G																REVISION	WGE OPTION
S3b	S2b																SHEET	
								K		K					K		REVISION	MTS MIRROR OPTION
								9am		7am					2a		SHEET	
								K		K					K		REVISION	MTS OPTION
								9a		7a					2a		SHEET	
G	G	G				K	K	K		K							REVISION	MIRROR OPTION
S3m	S2m	S1m				11m	10m	9m		7m							SHEET	
G	G	G	K	K	K	K	K	K	K	K	K	K	K	K	K	K	REVISION	STANDARD
S3	S2	S1	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	SHEET	

REVISIONS			
CHG. BY	APPR. BY	DATE	REV
SFB	WEC	09/02/08	H
UPDATE SHEETS 2,2b,8,9,9m,9a 9am,10 & 11			
SFB	WEC	09/02/08	J
UPDATE SHEETS 2,2a,6 & 8			
TJS	WEC	06/24/13	K
UPDATE ENTIRE PRINT			

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DRAWN BY T.K.SCOTT	DATE 08/15/02
CHECKED BY W.J.BLANKENSHIP	DATE 09/10/02
CHECKED BY S.R.SHUMATE	DATE 09/10/02
DO NOT SCALE DRAWING	
SIZE B	CAGE NO 53223 / REV K
SCALE 1/4"=1'0"	MODEL 2506

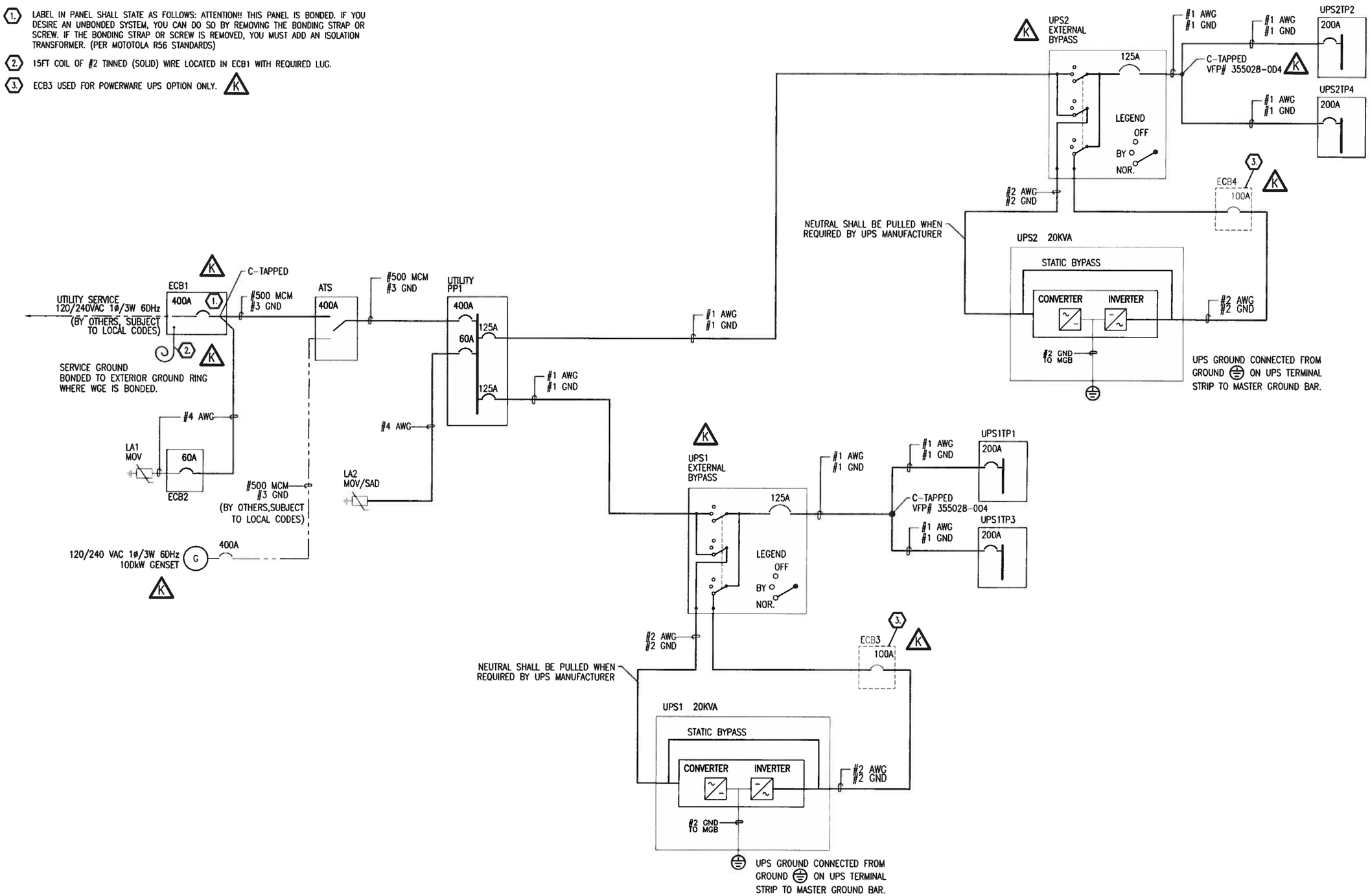
TITLE
11'8"x32'0"x9'2" CONC
MOTOROLA STANDARDS
TITLE SHEET

DRAWING NO. 202506

SHEET 1 OF 15

NOTES

1. LABEL IN PANEL SHALL STATE AS FOLLOWS: ATTENTION!! THIS PANEL IS BONDED. IF YOU DESIRE AN UNBONDED SYSTEM, YOU CAN DO SO BY REMOVING THE BONDING STRAP OR SCREW. IF THE BONDING STRAP OR SCREW IS REMOVED, YOU MUST ADD AN ISOLATION TRANSFORMER. (PER MOTOTOLA R56 STANDARDS)
2. 15FT COIL OF #2 TINNED (SOLID) WIRE LOCATED IN ECB1 WITH REQUIRED LUG.
3. ECB3 USED FOR POWERWARE UPS OPTION ONLY. K



ONE-LINE WIRING DIAGRAM

REVISIONS			
CHG. BY	APPR. BY	DATE	REV
SFB	WEC	09/02/08	H
UPDATES			
SFB	WEC	09/02/08	J
UPDATES			
TJS		06/24/13	K
UPDATE ENTIRE PRINT			

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DRAWN BY: T.K.SCOTT		DATE: 08/15/02
CHECKED BY: W.J.BLANKENSHIP		DATE: 09/10/02
CHECKED BY: S.R.SHUMATE		DATE: 09/10/02
DO NOT SCALE DRAWING		
SIZE: B	CAGE NO: 53223	REV: K
SCALE: 1/4"=1'0"	MODEL: 2506	

TITLE: 11'8"x32'0"x9'2" CONC MOTOROLA STANDARDS ONE-LINE DIAGRAM

DRAWING NO.: 202506

SHEET: 2 OF 15

PP1 UTILITY — 400A, 120/240VAC, 1ø/3W, 60Hz, M.BKR

LOAD	VOLT AMPS A	VOLT AMPS B	WIRE	BREAKER P	BREAKER TRIP			BREAKER TRIP	BREAKER P	WIRE	VOLT AMPS A	VOLT AMPS B	LOAD
UPS1 FEED	8400		1	2	125	1	2	30	1	10	250		TOWER LIGHT
		8400				3	4	30	1	10		250	TOWER LIGHT
* SITE POWER FAIL	120		12	2	15	5	6	60	2	4	60		* LIGHTNING ARRESTOR
		120										60	
ACH1	5280		6	2	60	9	10	60	2	6	5280		ACH2
		5280										5280	
SMOKE DETECTOR	120		12	1	15	13	14	15	1	12	120		** FIRE SUPPRESSION
LIGHTS, INT "A" & EXT.		1636	12	1	20	15	16	20	1	12		1260	INT RECEPTACLES B&C
LIGHTS, INT "B" , LM/EXIT	1252		12	1	20	17	18	20	1	12	720		INT RECEPTACLES A&D
SPARE		–	–	–	–	19	20	20	1	12		360	EXT. RECEPTACLE
BLANK	–		–	–	–	21	22	20	2	12	120		**** WTR HTR JKT
		–	–	–	–	23						120	*** **** BATTERY CHARGER
	–		–	–	–	25	26	–	–	–	–		BLANK
		–	–	–	–	27	28	–	–	–		–	
	–		–	–	–	29	30	–	–	–	–		
		–	–	–	–	31	32	–	–	–		–	
	–		–	–	–	33	34	125	2	1	8400		UPS2 FEED
		–	–	–	–	35						8400	
	–		–	–	–	37	38	30	2	–	1440		SUB-FEED
		–	–	–	–							1440	GENERATOR BUILDING (OPTIONAL)
VOLT AMPS PER PHASE	15172	15436									16390	17170	VOLT AMPS PER PHASE
											31562	32606	TOTAL VOLT AMPS
											263	272	TOTAL AMPS PER PHS
												340	AMPS x 125%
												374	MAIN x 110%

* WHEN MIRROR OPTION IS TAKEN CKT #5 AND #6 TRADE PLACES.
** WHEN FIRE SUPPRESSION OPTION IS NOT TAKEN CKT #14 SHALL BE A SPARE.
*** CKT 22 SHALL BE A SPARE WHEN ONAN OPTION IS USED.
**** GROUND FAULT PROTECTON BY OTHERS AS REQUIRED

UPS1TP1 TECH — 200A, 120/240VAC, 1ø/3W, 60Hz, M.BKR

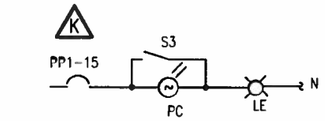
LOAD	VOLT AMPS A	VOLT AMPS B	WIRE	BREAKER P	BREAKER TRIP			BREAKER TRIP	BREAKER P	WIRE	VOLT AMPS A	VOLT AMPS B	LOAD
ROW #1, RECEPT #1	180		12	1	20	1	2	20	1	12	180		ROW #1, RECEPT #2
ROW #1, RECEPT #3		180	12	1	20	3	4	20	1	12		180	ROW #1, RECEPT #4
ROW #1, RECEPT #5	180		12	1	20	5	6	20	1	12	180		ROW #1, RECEPT #6
ROW #1, RECEPT #7		180	12	1	20	7	8	20	1	12		180	ROW #1, RECEPT #8
ROW #1, RECEPT #9	180		12	1	20	9	10	20	1	12	180		ROW #1, RECEPT #10
ROW #1, RECEPT #11		180	12	1	20	11	12	20	1	12		180	ROW #1, RECEPT #12
ROW #1, RECEPT #13	180		12	1	20	13	14	20	1	12	180		ROW #1, RECEPT #14
ROW #1, RECEPT #15		180	12	1	20	15	16	20	1	12		180	ROW #1, RECEPT #16
ROW #2, RECEPT #17	180		12	1	20	17	18	20	1	12	180		ROW #2, RECEPT #18
ROW #2, RECEPT #19		180	12	1	20	19	20	20	1	12		180	ROW #2, RECEPT #20
ROW #2, RECEPT #21	180		12	1	20	21	22	20	1	12	180		ROW #2, RECEPT #22
ROW #2, RECEPT #23		180	12	1	20	23	24	20	1	12		180	ROW #2, RECEPT #24
ROW #2, RECEPT #25	180		12	1	20	25	26	20	1	12	180		ROW #2, RECEPT #26
ROW #2, RECEPT #27		180	12	1	20	27	28	20	1	12		180	ROW #2, RECEPT #28
ROW #2, RECEPT #29	180		12	1	20	29	30	20	1	12	180		ROW #2, RECEPT #30
ROW #2, RECEPT #31		180	12	1	20	31	32	20	1	12		180	ROW #2, RECEPT #32
BLANK	–		–	–	–	33	34	–	–	–	–		BLANK
		–	–	–	–	35	36	–	–	–		–	
	–		–	–	–	37	38	–	–	–	–		
		–	–	–	–	39	40	–	–	–		–	
VOLT AMPS PER PHASE	1440	1440									1440	1440	VOLT AMPS PER PHASE
											2880	2880	TOTAL VOLT AMPS
											24	24	TOTAL AMPS PER PHS
												30	AMPS x 125%
												33	MAIN x 110%

UPS2TP2 TECH — 200A, 120/240VAC, 1ø/3W, 60Hz, M.BKR

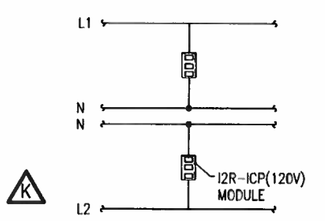
LOAD	VOLT AMPS A	VOLT AMPS B	WIRE	BREAKER P	BREAKER TRIP			BREAKER TRIP	BREAKER P	WIRE	VOLT AMPS A	VOLT AMPS B	LOAD
ROW #1, RECEPT #1	180		12	1	20	1	2	20	1	12	180		ROW #1, RECEPT #2
ROW #1, RECEPT #3		180	12	1	20	3	4	20	1	12		180	ROW #1, RECEPT #4
ROW #1, RECEPT #5	180		12	1	20	5	6	20	1	12	180		ROW #1, RECEPT #6
ROW #1, RECEPT #7		180	12	1	20	7	8	20	1	12		180	ROW #1, RECEPT #8
ROW #1, RECEPT #9	180		12	1	20	9	10	20	1	12	180		ROW #1, RECEPT #10
ROW #1, RECEPT #11		180	12	1	20	11	12	20	1	12		180	ROW #1, RECEPT #12
ROW #1, RECEPT #13	180		12	1	20	13	14	20	1	12	180		ROW #1, RECEPT #14
ROW #1, RECEPT #15		180	12	1	20	15	16	20	1	12		180	ROW #1, RECEPT #16
ROW #2, RECEPT #17	180		12	1	20	17	18	20	1	12	180		ROW #2, RECEPT #18
ROW #2, RECEPT #19		180	12	1	20	19	20	20	1	12		180	ROW #2, RECEPT #20
ROW #2, RECEPT #21	180		12	1	20	21	22	20	1	12	180		ROW #2, RECEPT #22
ROW #2, RECEPT #23		180	12	1	20	23	24	20	1	12		180	ROW #2, RECEPT #24
ROW #2, RECEPT #25	180		12	1	20	25	26	20	1	12	180		ROW #2, RECEPT #26
ROW #2, RECEPT #27		180	12	1	20	27	28	20	1	12		180	ROW #2, RECEPT #28
ROW #2, RECEPT #29	180		12	1	20	29	30	20	1	12	180		ROW #2, RECEPT #30
ROW #2, RECEPT #31		180	12	1	20	31	32	20	1	12		180	ROW #2, RECEPT #32
BLANK	–		–	–	–	33	34	–	–	–	–		BLANK
		–	–	–	–	35	36	–	–	–		–	
	–		–	–	–	37	38	–	–	–	–		
		–	–	–	–	39	40	–	–	–		–	
VOLT AMPS PER PHASE	1440	1440									1440	1440	VOLT AMPS PER PHASE
											2880	2880	TOTAL VOLT AMPS
											24	24	TOTAL AMPS PER PHS
												30	AMPS x 125%
												33	MAIN x 110%

UPS1TP3 TECH — 200A, 120/240VAC, 1ø/3W, 60Hz, M.BKR

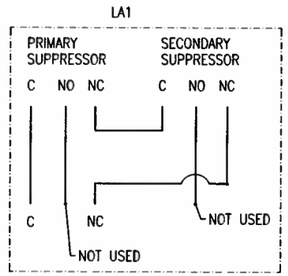
LOAD	VOLT AMPS A	VOLT AMPS B	WIRE	BREAKER P	BREAKER TRIP			BREAKER TRIP	BREAKER P	WIRE	VOLT AMPS A	VOLT AMPS B	LOAD
ROW #3, RECEPT #1	180		12	1	20	1	2	20	1	12	180		ROW #3, RECEPT #2
ROW #3, RECEPT #3		180	12	1	20	3	4	20	1	12		180	ROW #3, RECEPT #4
ROW #3, RECEPT #5	180		12	1	20	5	6	20	1	12	180		ROW #3, RECEPT #6
ROW #3, RECEPT #7		180	12	1	20	7	8	20	1	12		180	ROW #3, RECEPT #8
ROW #3, RECEPT #9	180		12	1	20	9	10	20	1	12	180		ROW #3, RECEPT #10
ROW #3, RECEPT #11		180	12	1	20	11	12	20	1	12		180	ROW #3, RECEPT #12
ROW #3 RECEPT #13	180		12	1	20	13	14	20	1	12	180		ROW #3, RECEPT #14
ROW #3, RECEPT #15		180	12	1	20	15	16	20	1	12		180	ROW #3, RECEPT #16
ROW #4, RECEPT #17	180		12	1	20	17	18	20	1	12	180		ROW #4, RECEPT #18
ROW #4, RECEPT #19		180	12	1	20	19	20	20	1	12		180	ROW #4, RECEPT #20
ROW #4, RECEPT #21	180		12	1	20	21	22	20	1	12	180		ROW #4, RECEPT #22
ROW #4, RECEPT #23		180	12	1	20	23	24	20	1	12		180	ROW #4, RECEPT #24
ROW #4, RECEPT #25	180		12	1	20	25	26	20	1	12	180		ROW #4, RECEPT #26
ROW #4, RECEPT #27		180	12	1	20	27	28	20	1	12		180	ROW #4, RECEPT #28
ROW #4, RECEPT #29	180		12	1	20	29	30	20	1	12	180		ROW #4, RECEPT #30
ROW #4, RECEPT #31		180	12	1	20	31	32	20	1	12		180	ROW #4, RECEPT #32
BLANK	–		–	–	–	33	34	–	–	–	–		BLANK
		–	–	–	–	35	36	–	–	–		–	
	–		–	–	–	37	38	–	–	–	–		
TELCO RECPT #1		180	12	1	20	39	40	20	1	12		180	TELCO RECPT #2
VOLT AMPS PER PHASE	1440	1620									1440	1620	VOLT AMPS PER PHASE
											2880	3240	TOTAL VOLT AMPS
											24	27	TOTAL AMPS PER PHS
												34	AMPS x 125%
												38	MAIN x 110%



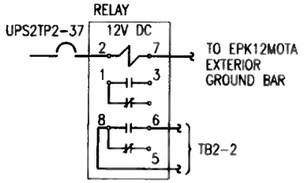
EXTERIOR LTG. CKT.



120V SURGE PROTECTOR MODULE



LIGHTNING ARRESTOR ALARM WIRING



GROUNDBAR ALARM WIRING DIAGRAM

REVISIONS			
CHG. BY	APPR. BY	DATE	REV
TJC	SRS	9/30/05	D
UPDATES			
TKL	WEC	07/01/08	G
UPDATE COMM PWR FAIL			
TJS	WEC	06/24/13	K
UPDATE ENTIRE PRINT			

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DRAWN BY T.K.SCOTT	DATE 08/15/02
CHECKED BY W.J.BLANKENSHIP	DATE 10/05/02
CHECKED BY S.R.SHUMATE	DATE 10/05/02
DO NOT SCALE DRAWING	
SIZE B / CAGE NO 53223	REV K
SCALE 1/4"=1'0" / MODEL 2506	
TITLE: 11'8"x32'0"x9'2" CONC MOTOROLA STANDARDS PANEL SCHEDULES	
DRAWING NO. 202506	
SHEET 3 OF 15	

FIRE SUPPRESSION CONCENTRATION CALCULATION

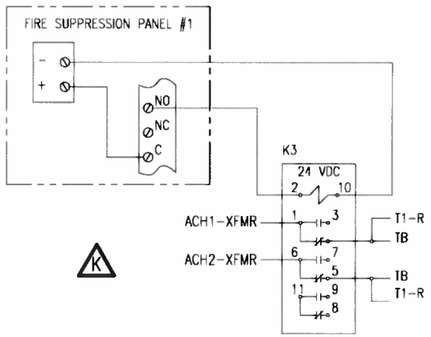
V = VOLUME = $\frac{129" \times 277" \times 110"}{1728\ in^3\ /\ ft^3} = 2275 ft^3$

W = CHEMICAL WEIGHT = 77.5 lbs

S = SPECIFIC VAPOR VOLUME = 2.201 $\frac{ft^3}{lb}$ (AT 70° F)

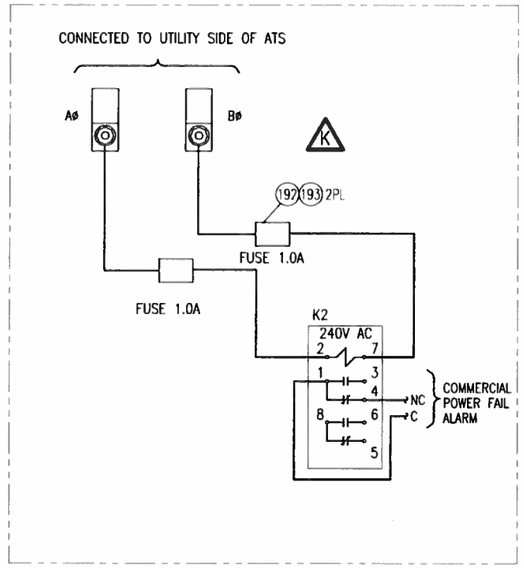
Y = $\frac{V}{W \times S} = \frac{2275}{77.5 \times 2.201} = 13.3$

C = CONCENTRATION = $\frac{1}{Y + 1} \times 100\ \% = \frac{100}{13.3 + 1} = 7.0\%$ CONC.



FIRE SUPPRESSION SHUTDOWN DIAGRAM

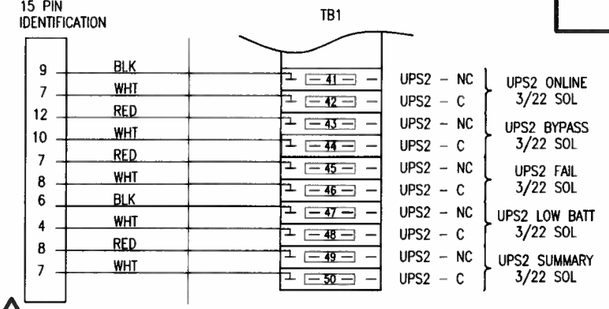
ATS



UPS2TP4 TECH 200A, 120/240VAC, 1ø/3W, 60Hz, M.BKR

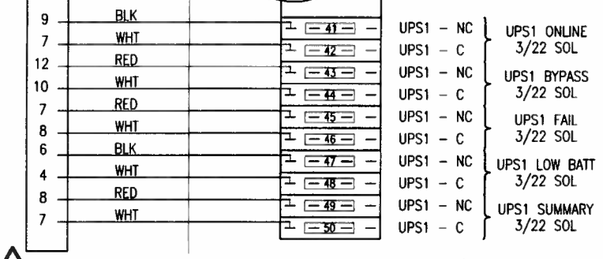
LOAD	VOLT AMPS A	VOLT AMPS B	WIRE	BREAKER P	BREAKER TRIP		BREAKER TRIP	WIRE P	VOLT AMPS A	VOLT AMPS B	LOAD
ROW #3, RECEPT #1	180		12	1	20	1 2	20	1	12	180		ROW #3, RECEPT #2
ROW #3, RECEPT #3		180	12	1	20	3 4	20	1	12		180	ROW #3, RECEPT #4
ROW #3, RECEPT #5	180		12	1	20	5 6	20	1	12	180		ROW #3, RECEPT #6
ROW #3, RECEPT #7		180	12	1	20	7 8	20	1	12		180	ROW #3, RECEPT #8
ROW #3, RECEPT #9	180		12	1	20	9 10	20	1	12	180		ROW #3, RECEPT #10
ROW #3, RECEPT #11		180	12	1	20	11 12	20	1	12		180	ROW #3, RECEPT #12
ROW #3, RECEPT #13	180		12	1	20	13 14	20	1	12	180		ROW #3, RECEPT #14
ROW #3, RECEPT #15		180	12	1	20	15 16	20	1	12		180	ROW #3, RECEPT #16
ROW #4, RECEPT #17	180		12	1	20	17 18	20	1	12	180		ROW #4, RECEPT #18
ROW #4, RECEPT #19		180	12	1	20	19 20	20	1	12		180	ROW #4, RECEPT #20
ROW #4, RECEPT #21	180		12	1	20	21 22	20	1	12	180		ROW #4, RECEPT #22
ROW #4, RECEPT #23		180	12	1	20	23 24	20	1	12		180	ROW #4, RECEPT #24
ROW #4, RECEPT #25	180		12	1	20	25 26	20	1	12	180		ROW #4, RECEPT #26
ROW #4, RECEPT #27		180	12	1	20	27 28	20	1	12		180	ROW #4, RECEPT #28
ROW #4, RECEPT #29	180		12	1	20	29 30	20	1	12	180		ROW #4, RECEPT #30
ROW #4, RECEPT #31		180	12	1	20	31 32	20	1	12		180	ROW #4, RECEPT #32
BLANK	–		–	–	–	33 34	–	–	–	–		BLANK
|		–	–	–	–	35 36	–	–	–		–	|
|	–		–	–	–	37 38	–	–	–	–		|
TELCO RECEPT #3		180	12	1	20	39 40	20	1	12		180	TELCO RECEPT #4
VOLT AMPS PER PHASE	1440	1620								1440	1620	VOLT AMPS PER PHASE
										2880	3240	TOTAL VOLT AMPS
										24	27	TOTAL AMPS PER PHS
											34	AMPS x 125%
											38	MAIN x 110%

COMMERCIAL POWER FAIL DIAGRAM



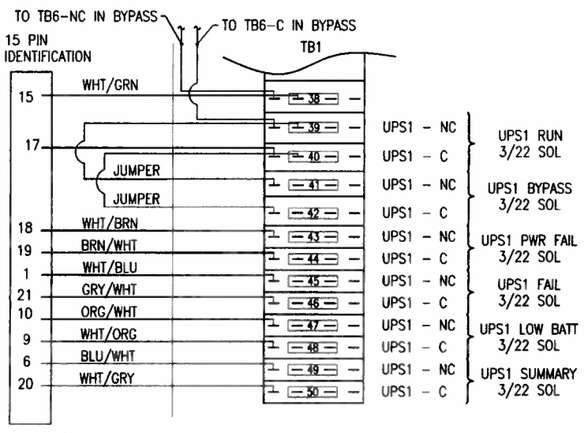
POWERWARE UPS1 ALARM CONNECTIONS (UPS OPTION)

POWERWARE 9170 18KVA UPS 15-PIN INTERFACE CABLE CONNECTION



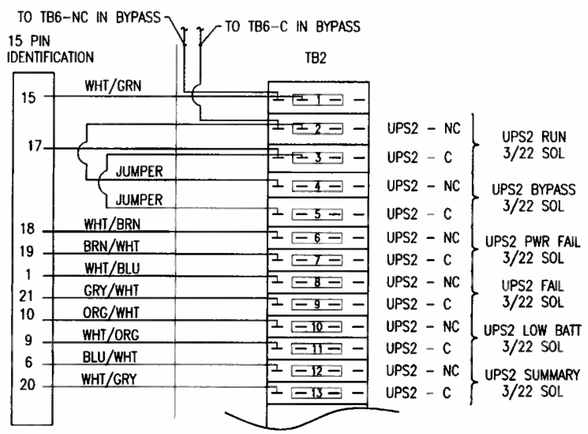
POWERWARE UPS2 ALARM CONNECTIONS (UPS OPTION)

POWERWARE 9170 18KVA UPS 15-PIN INTERFACE CABLE CONNECTION



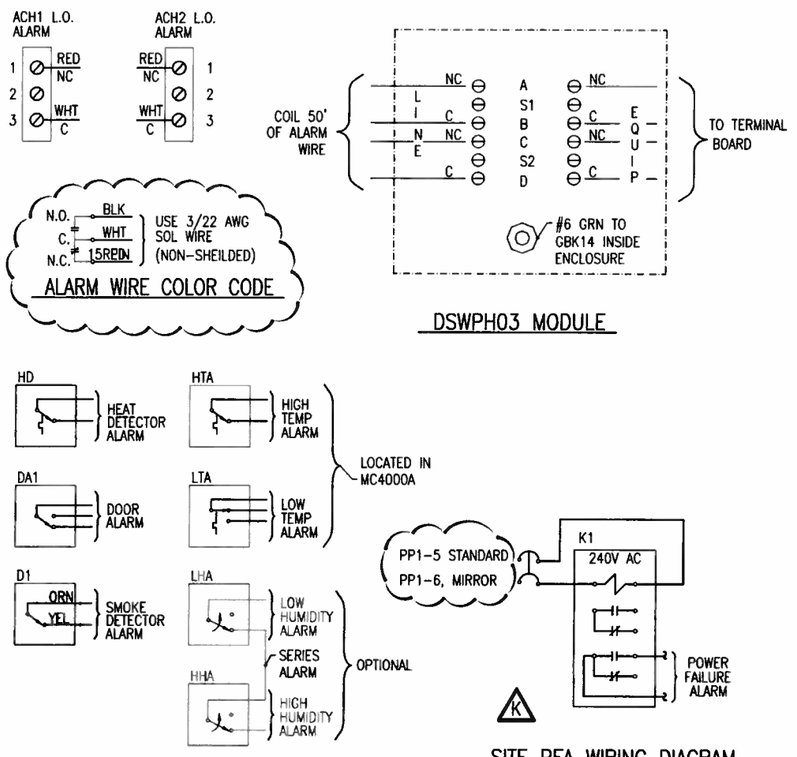
LIEBERT UPS1 ALARM CONNECTIONS

LEIBERT 20KVA UPS 15-PIN INTERFACE CABLE CONNECTION



LIEBERT UPS2 ALARM CONNECTIONS

LEIBERT 20KVA UPS 15-PIN INTERFACE CABLE CONNECTION



REVISIONS			
CHG. BY	APPR. BY	DATE	REV
TTW	SRS	4/7/05	C
UPDATES			
TKL	WEC	06/16/08	G
ADD COMMERCIAL PFA ALARM, REMOVE SERIES FROM ACH,HTA,LTA			
TJS	WEC	06/24/13	K
UPDATE ENTIRE PRINT			

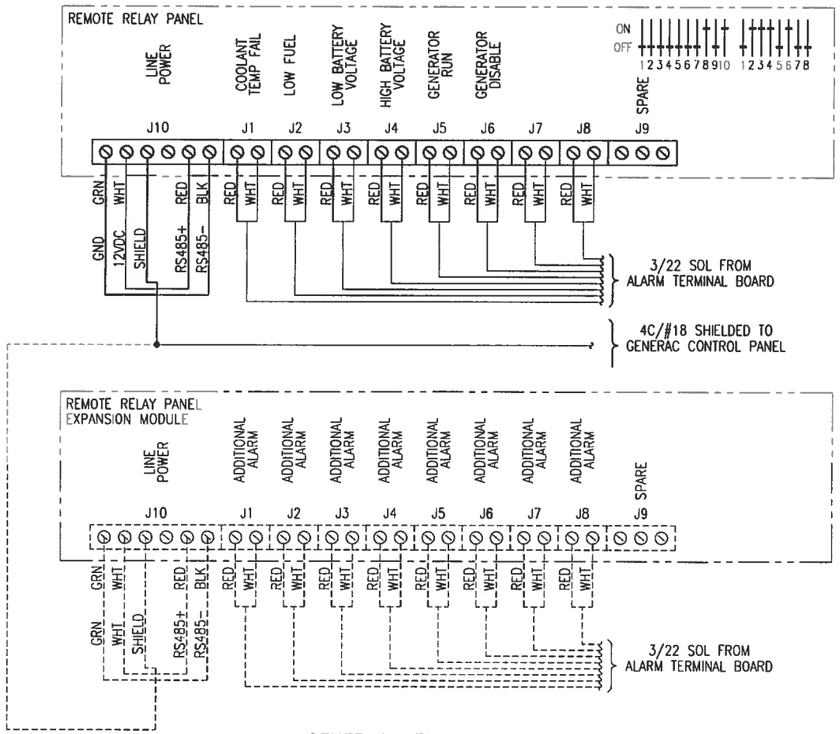
VFP, INC.

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17D1 Midland Road
Salem, Virginia 24153-6424
(540)977-0500 (540)977-5555 fax

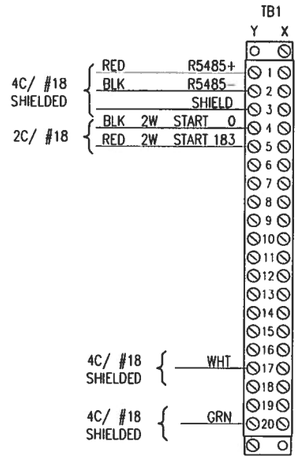
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(276)431-4000 (276)431-1756 fax

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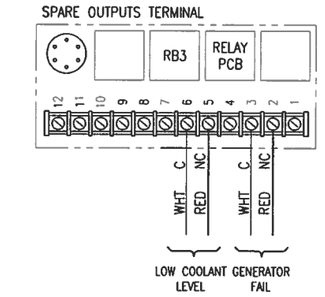
DRAWN BY T.K.SCOTT	DATE 08/15/02
CHECKED BY W.J.BLANKENSHIP	DATE 09/15/02
CHECKED BY S.R.SHUMATE	DATE 09/15/02
DO NOT SCALE DRAWING	
SIZE B / CAGE NO 53223	REV K
SCALE 1/4"=1'0"	MODEL 2506
TITLE: 11'8"x32'0"x9'2" CONC MOTOROLA STANDARDS ALARM WIRING	
DRAWING NO. 202506	
SHEET 4 OF 15	



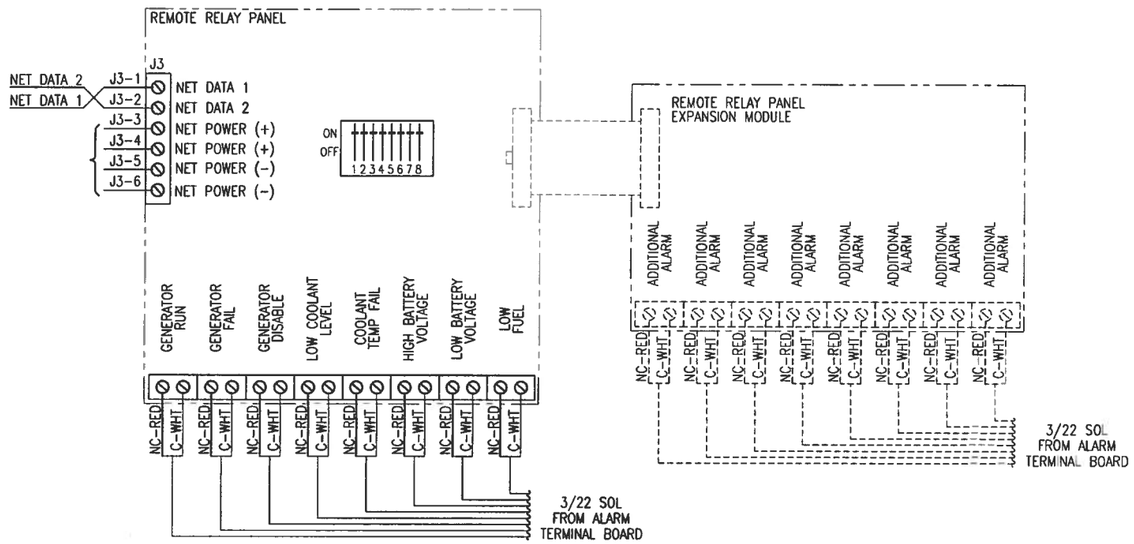
GENERAC REMOTE RELAY WIRING



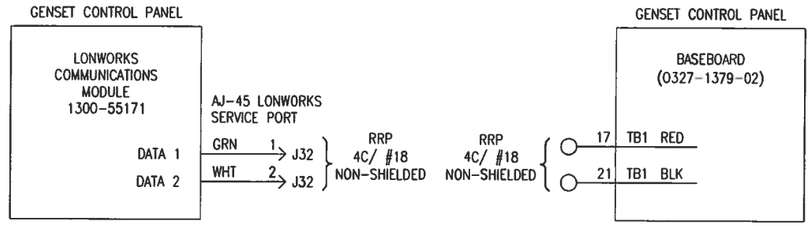
GENERAC CONTROL PANEL



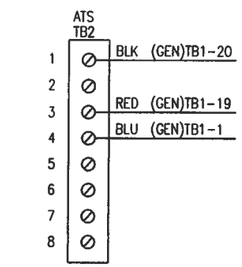
GENERAC SPARE OUTPUT WIRING



ONAN REMOTE RELAY WIRING



ONAN REMOTE RELAY PANEL WIRING



ONAN GENSET START CIRCUIT

REVISIONS			
CHG. BY	APPR. BY	DATE	REV
TJS	WEL	06/24/13	K
UPDATE ENTIRE PRINT			

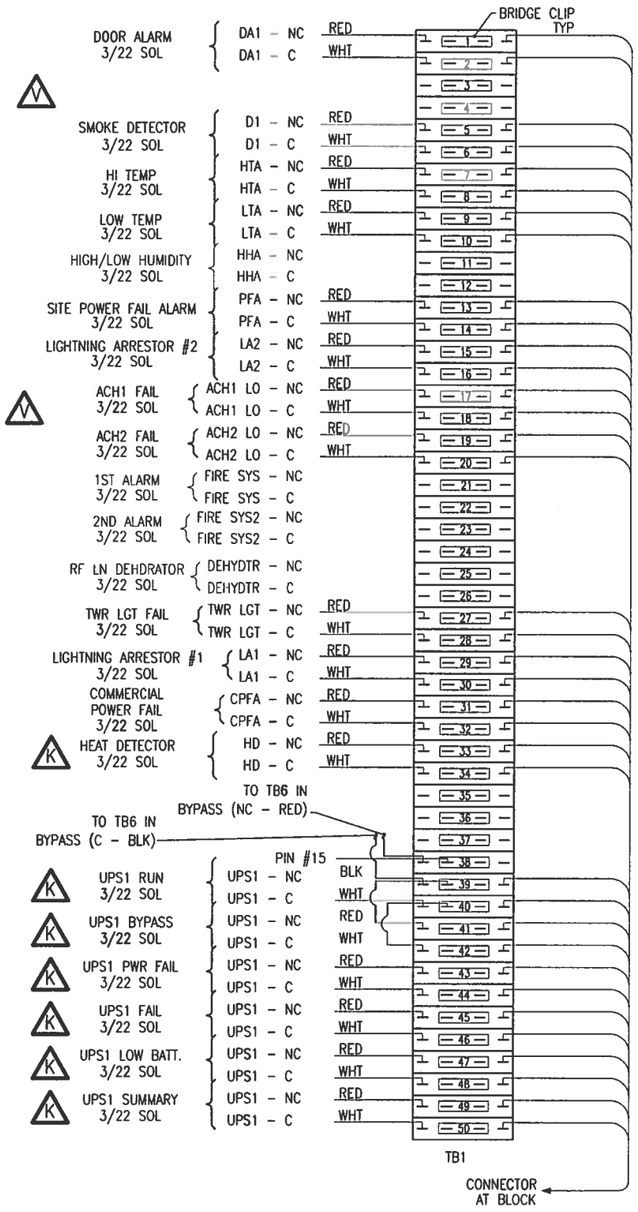
VFP, INC.

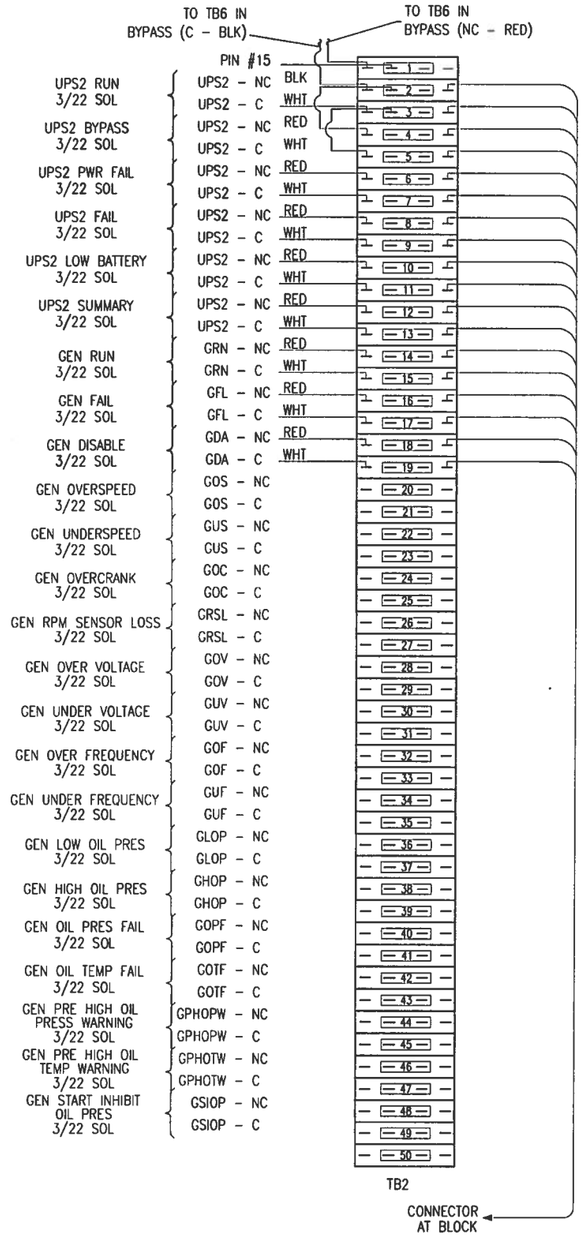
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(540)977-0500 (540)977-5555 fax

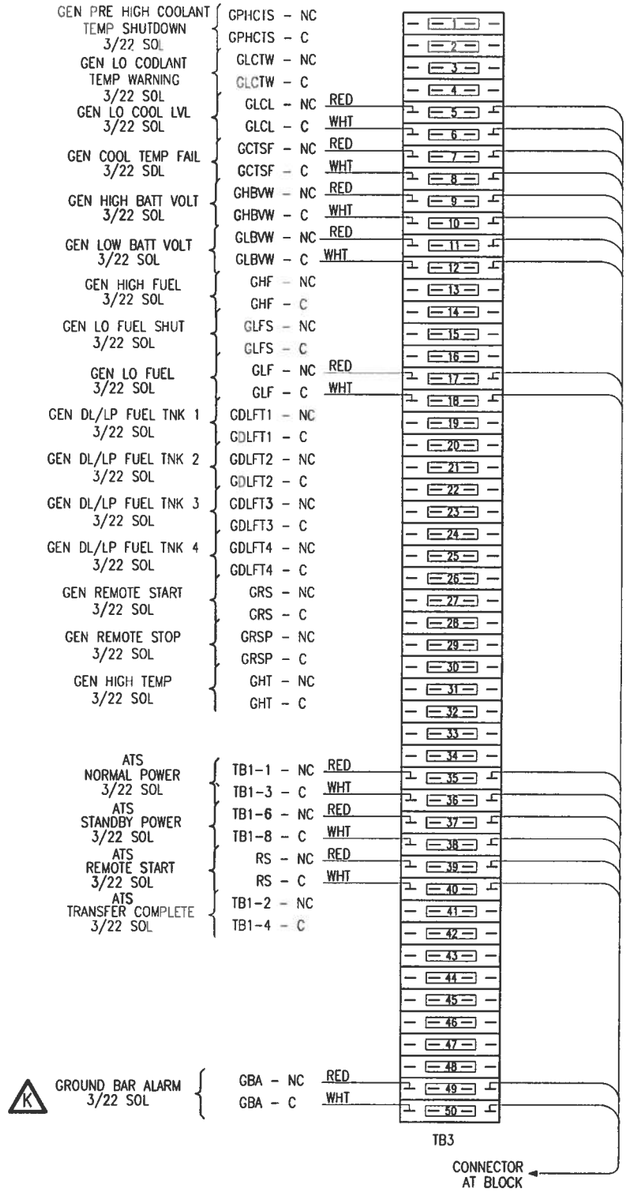
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CHECKED BY: W.J.BLANKENSHIP	DATE: 09/15/02
CHECKED BY: S.R.SHUMATE	DATE: 09/15/02
DO NOT SCALE DRAWING	
SIZE: B	CAGE NO: 53223 REV: K
SCALE: 1/4"=1'0"	MODEL: 2506
TITLE: 11'8"x32'0"x9'2" CONC MOTOROLA STANDARDS GENERATOR WIRING	
DRAWING NO.: 202506	
SHEET: 5 OF 15	







TERMINAL BOARD DETAIL

ALL ALARMS WITHOUT WIRE SHOWN ARE OPTIONAL

* ALLOW NO MORE THAN A 2" LOOP AT THE END OF EACH PUNCHED DOWN WIRE. INDIVIDUAL WIRES SHALL ENTER THE PUNCH TERMINAL FROM THE TOP SO THAT THE WIRE TAIL POINTS DOWN AFTER PUNCH DOWN.

REVISIONS			
CHG. BY	APPR. BY	DATE	REV
TKL	WEC	06/17/08	G
RUN HTA/LTA & ACH ALARMS SEPARATE, ADD COMMERCIAL PFA			
SFB	WEC	06/10/09	J
ADD ALARM			
TJS		06/24/13	K
UPDATE ENTIRE PRINT			

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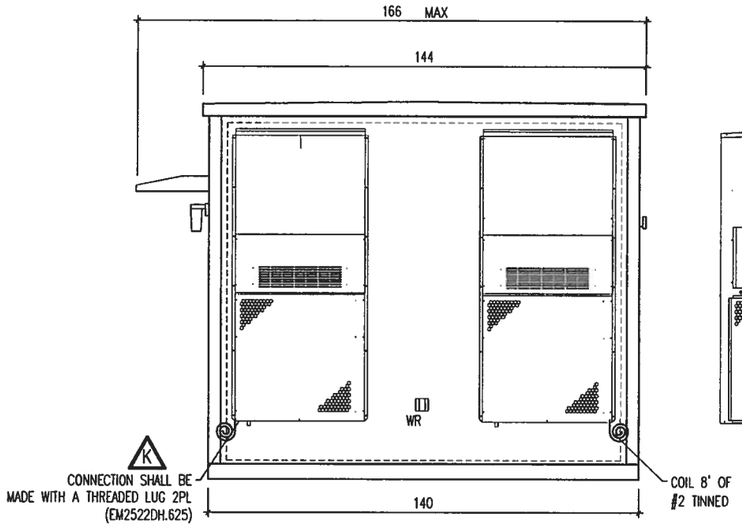
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DRAWN BY T.K.SCOTT		DATE 08/15/02
CHECKED BY W.J.BLANKENSHIP		DATE 09/10/02
CHECKED BY S.R.SHUMATE		DATE 09/10/02
DO NOT SCALE DRAWING		
SIZE B	CAGE NO 53223	REV K
SCALE 1/4"=1'0"	MODEL 2506	

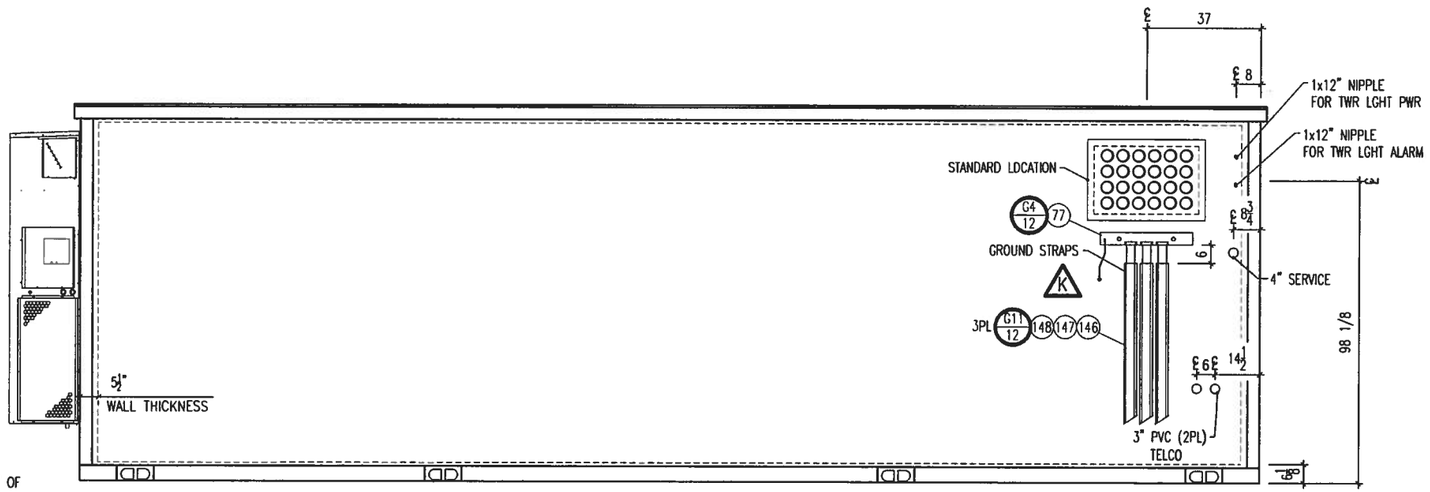
TITLE
11'8"x32'0"x9'2" CONC
MOTOROLA STANDARDS
ALARM TERMINAL BOARDS

DRAWING NO. 202506

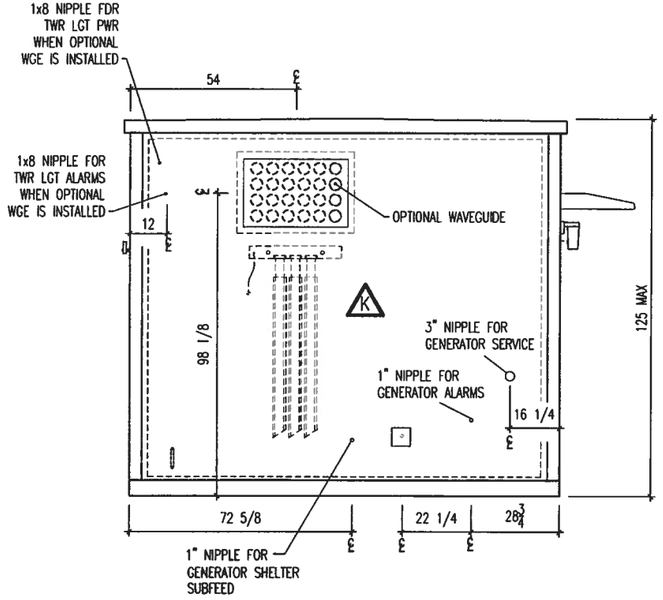
SHEET 6 OF 15



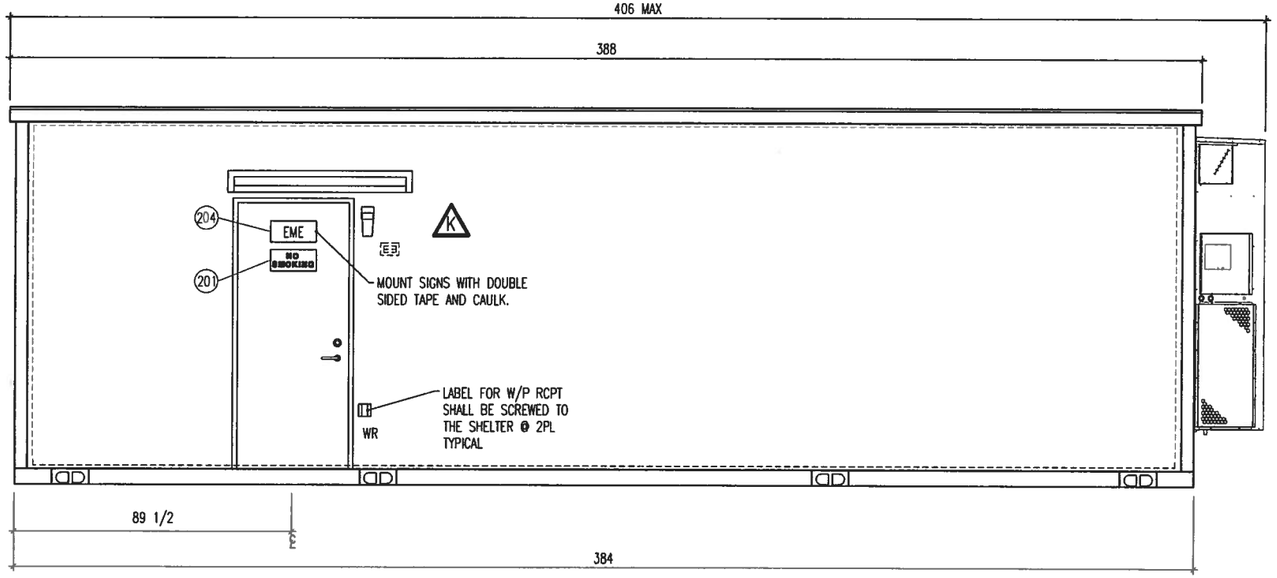
RIGHT WALL ELEVATION 'D'



REAR WALL ELEVATION 'C'



LEFT WALL ELEVATION 'B'



FRONT WALL ELEVATION 'A'

EXTERIOR ELEVATIONS

DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

REVISIONS			
CHG. BY	APPR. BY	DATE	REV
TJC	SRS	9/30/05	D
UPDATES			
TKL	WEC	06/17/08	G
ADD NOTE AT ACH COIL, ADD DIMENSION FOR SUBFEED NIPPLE			
TJS		06/24/13	K
UPDATE ENTIRE PRINT			

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CHECKED BY: W.J.BLANKENSHIP		DATE: 09/10/02
APPROVED BY: S.R.SHUMATE		DATE RELEASED: 09/10/02
DO NOT SCALE DRAWING		
SIZE: B	CAGE NO: 53223	REV: K
SCALE: 1/4"=1'0"	MODEL: 2506	

TITLE: 11'8"x32'0"x9'2" CONC MOTOROLA STANDARDS EXTERIOR ELEVATIONS

DRAWING NO. 202506

SHEET 7 OF 15

ONAN GENERATOR OPTION

QTY	U/M	PART NO.	DESCRIPTION		ITEM
1	EA	2507ATS2	ATS, 225A, 1PH, 240V	ATS	207
1	EA	355600-101	REMOTE RELAY PANEL,8 MODBUS	RRP	206
1	EA	2507GEN2	GENSET,50KW,LP,120/240V,60HZ	GEN	165
1	EA	350091-008	ENCLOSURE,N1,SC,NK,12x12x4		36

POWERWARE UPS OPTION

QTY	U/M	PART NO.	DESCRIPTION		ITEM
1	EA	2507UPSP	BYPASS SWITCH	UPS	174
1	EA	2507UPSP	UPS,18KVA,120/240,1PH	RRP	173
1	EA	SN100FA	NEUTRAL KIT, 100A		19
1	EA	FA100S	ENCLOSURE, CKT BKR, 100A	ECB3	18
1	EA	FAL22100	CKT BKR, 2/100A		17

TRANSTECTOR/LIEBERT TVSS OPTION

QTY	U/M	PART NO.	DESCRIPTION		ITEM
1	EA	355200-001	ARRESTOR,LTG,120/240,MOV/SAD	LA2	24
1	EA	355200-002	ARRESTOR,LTG,120/240,MOV	LA1	23
1	EA	SS550120SFNSP	ARRESTOR,LTG,120/240,MOV/SAD	LA2	24
1	EA	SS500120SFNSP	ARRESTOR,LTG,120/240,MOV	LA1	23

MTS OPTION

QTY	U/M	PART NO.	DESCRIPTION		ITEM
3	EA	350011-200	CONDULET, 2" LB, W/CVR & GASKET		116
5	EA	350075-212	NIPPLE, RGD, 2 X 8		64
1	EA	350075-201	NIPPLE, RGD, 2 X CLOSE		264
1	EA	DT224URK	SWITCH, DPDT, 200A, NF, 3R	MTS	263
1	EA	DT200NK	NEUTRAL KIT		262
1	EA	AJA20044-200RS	RECEPTACLE, 200A, 4P,4W	GNR	261
1	EA	AP20044E-RS	PLUG, RECEPT, 200A	S/L	260

2506FSS FIRE SUPPRESSION OPTION

QTY	U/M	PART NO.	DESCRIPTION		ITEM
1	EA	350091-001	ENCLOSURE, 6x6x4		252
1	EA	2A584	SOCKET, 14PIN		251
1	EA	355049-024	RELAY, 4PDT, 3A, 24VDC	K3	250
AR	EA	350003-001	COVER, 4SQ, BLK		249
AR	EA	350130-003	COVER, OCTAGON		248
AR	EA	350048-001	COVER, SGL DEV, +-1/4		247
AR	EA	350047-002	BOX, OCTAGON		245
AR	EA	350001-002	BOX, 4SQ X 2-1/8", 1/2-3/4 KO		244
2	EA	365044-150	ELBOW, 90, 1-1/2", 300#		241
20	FT	365124-150	PIPE, 150#		240
1	EA	365117-150	UNION, 1-1/2", 300#		239
2	EA	365132-151	NIPPLE, 1-1/2 X CLOSE, 150#		238
1	EA	365070-003	BELL REDUCER, 2-1/2-1-1/2, 300#		237
1	EA	350075-160	NIPPLE, RGD, 1/2 X 8		235
1	EA	024962	WARNING SIGN,INT		234
1	EA	10-122-WR	STROBE/ EXT	FS	233
1	EA	023646	WARNING SIGN		232
1	EA	02-3710	MANUAL RELEASE	FP	231
1	EA	10-1643	ABORT STATION	FA	230
1	EA	20-106-A	HORN\STROBE, 24VDC INT	FHS	229
1	EA	179016-014	PHOTO DETECTOR	PD	228
1	EA	179016-015	IONIZATION DETECTOR	ID	227
2	EA	67-1036	DETECTOR BASE PLATES		226
1	EA	80-1115	NOZZLE, 180°, 1-1/2"	NZ	225
2	EA	179021-005	BATTERIES, 7AH, 12VDC		223
1	EA	10-2143	RELAY MODULE PANEL		222
1	EA	179011-011	CONTROL PANEL (RHINO)	FCP	221
1	EA	179054-078	CYLINDER, 100LBS, 78 FILL	FT	220

QTY	U/M	PART NO.	DESCRIPTION		ITEM
1	EA	AJA40044-400RS	RECEPT,400A,4W,4P,RS,W/BX	GNR	213
1	EA	AP40044E-RS	PLUG,400A,4W,4P,RS	SHIPLOOSE	212
1	EA	DS400NK	NEUTRAL KIT, 400A		211
1	EA	DT225URK	SWITCH,DPDT,400A,NF,3R,250V	MTS	210
1	EA	2506GEN	GENSET, 70KW,LP,3R		209
1	EA	2506ATS	ATS, 300A, 1PH, 120/240V	ATS	207
1	EA	355600-001	REMOTE RELAY PANEL, 8 MODBUS	RRP	206
1	EA	178124-001	ELECTRO EMISSION SIGN		204
1	EA	178126-002	WASTEBASKET	SHIPLOOSE	203
1	EA	178088-001	UTILITY HOLDER	SHIPLOOSE	202
1	EA	4T676	SIGN, NO SMOKING		201
1	EA	178089-001	BROOM	SHIPLOOSE	200
1	EA	178091-001	DUST PAN	SHIPLOOSE	199
2	EA	ATDR1	FUSE, 1A, CLASS CC		193
2	EA	CHCC1D	FUSEHOLDER		192
2	EA	5X852	SOCKET, 8PIN		191
2	EA	355012-240	RELAY,10A, DPDT, 240V	K1,2	190
1	EA	7100F	DETECTOR, SMOKE, 120V	D1	188
1	EA	160031-107	TELCO BOARD. 36"X48"x3/4", GRAY		180
2	EA	2506UPS	BYPASS SWITCH,		174
2	EA	2506UPS	UPS, 20KVA,POWER MODULE	UPS1,2	173
32	EA	155011-045	LAMP, FLUOR, 32W, C WHITE		162
8	EA	155016-015	FIXTURE, FLUOR, 4 TUBE, 4 FT	LF	161
1	EA	155046-001	LIGHT, EMERGENCY/EXIT	LM	158
.2	FT	176006-300	CONDUIT, 3", PVC	SHIPLOOSE	153
2	EA	176008-300	COUPLING,3", PVC	SHIPLOOSE	152
2	EA	176022-300	CAP, PVC, 3"	SHIPLOOSE	151
6	EA	4200-56	INSULATOR		150
6	EA	101683-1	BRACKET, GB		149
3	EA	178113-001	GROUND STRAP BARS	SHIPLOOSE	148
3	EA	178113-101	GROUND STRAP COVER	SHIPLOOSE	147
60	EA	R125-P	RIVETS	SHIPLOOSE	146
* 20	FT	360010-150	ROD, THREADED, 1/2"		145
* 20	EA	CRSHB121	BRACKET, HGR, SLOT, 1/2"		144
2	EA	QO124M125	LOAD CTR, 125A,MB	UPS1TP3,UPS2TP4	143
2	EA	QOC24US	COVER,LOAD CTR		142
2	EA	PK15GTA	GROUND BAR KIT		141

QTY	U/M	PART NO.	DESCRIPTION		ITEM
24	EA	178137-004	WIREMOLD, BLK COVER, 4-HOLE		139
3	EA	ALA4800B-8	WIREMOLD, 8FT		138
8	EA	ALA4810B	END CAP, BLK, WIREMOLD		137
24	EA	ALA-BL	WIRE MOLD,BLK CVR		136
1	EA	195002-002	EYE WASH KIT	EW	135
1	EA	195001-005	FIRST AID KIT	FK	134
1	EA	178092-001	FILE HOLDER	FH	133
2	EA	178137-002	WIREMOLD, BLK COVER, 2-HOLE		132
.1	EA	ALA4800B-10	WIREMOLD, 10FT		131
3	EA	F44GUC	WIREWAY, U-CONN	WW4	129
2	EA	F44GCPNK	WIREWAY, CLOSURE PLATE	WW4	128
2	EA	F44G120	WIREWAY, 4SQ X 10	WW4	126
1	EA	F44G90E	WIREWAY, 90, ELBOW	WW4	125
1	EA	F44G48	WIREWAY, 4SQ X 4	WW4	124
3	EA	S66M2-5W	CONNECTING BLOCK	TB1,2,3	120
3	EA	155222-001	CONNECTOR, AMPHENOL, CABLE		119
150	EA	155041-301	BRIDGE CLIP		118
2	PK	165336-001	CABLE TRAY, WALL MNT ANGLE		114
1	EA	350248-006	CABLE TRAY, 6 x 30	CL	111
* 1	EA	350248-024	CABLE TRAY, 24 x 73	CL	110
1	EA	350248-006	CABLE TRAY, 6 x 32	CL	109
* 1	EA	350248-024	CABLE TRAY, 24 x 53	CL	106
3	EA	350248-024	CABLE TRAY, 24 x 90	CL	105
* 3	EA	350248-024	CABLE TRAY, 24 X 36	CL	104
* 7	ST	350063-001	CABLE TRAY CORNER		103
* 20	EA	165342-101	BRACKET, CABLE LADDER HANGER	CLH	102
* 22	EA	165335-101	RUBBER CAPS		101
21	EA	2107	BRACKET,CABLE RING,1½x5		100
1	EA	378027-434	ENTRY, WAVEGUIDE, 4x3	WGE	99
1	EA	195005-001	FIRE EXTING, CO2, 10#	FE1	97
1	EA	195009-003	FIRE EXTING, DRY CHEM, 20#	FE2	96
1	EA	165291-001	DOOR CAP, 36"		95
1	EA	US24R40932D	DOOR BUMPER		94
1	EA	165047-007	LOCK, DBOLT, BEST	***	93
1	EA	178133-001	GASKET, BRONZE, DOOR, 3'X6'8"		92
1	EA	360014-048	FLASHING, AL, 145°, 1-1/2x2x48		91
2	EA	DJBFD-2-32D	STRIKE PLATE		90
1	EA	265192-001	THRESHOLD	***	89
1	EA	200NA	DOOR SWEEP	***	88
1	EA	1C7A1626	CORE, BEST, 7 PIN, A TYPE		87
1	EA	301471-056	AWNING, 56		86
3	EA	165411-001	HINGE, DOOR, SS, TAMPERPROOF,SS		85
1	EA	355020-003	DOOR ALARM	DA	84
1	EA	365020-001	DOOR CLOSURE, HYD	***	83
1	EA	165193-001	HOLDER, EXT. DOOR		82
1	EA	165420-001	LEVERSET, ARROW	***	81
1	EA	365357-1864	DOOR, GALV, #23, 36 x 84	***	80
1	EA	EPK12MOTA	GROUND BAR (INT & EXT)	MGB	77
1	EA	301501-001	GROUND BAR ALARM KIT	GBA	76
1	EA	155017-001	PHOTOCELL, 120V, 50/60Hz	PC	74
1	EA	195003-009	LIGHT, GLOBE, EXT, ICAN, LXN		72
1	EA	195003-007	LIGHT FIXT,EXT,INCAN,100W	LE	71
1	EA	350075-309	NIPPLE, RGD, 3 X 12		70
2	EA	350075-128	NIPPLE, RGD, 1-1/4 X 6		69
* 2	EA	350075-111	NIPPLE, RGD, 1 X 12		67
3	EA	350075-107	NIPPLE, RGD, 1 X 8		66
4	EA	176009-125	TERMINAL ADAPTER, 1 1/4, PVC		65
1	EA	350075-308	NIPPLE, RGD, 3 X 8		64
1	EA	350075-306	NIPPLE, RGD, 3 X 6		
AR	EA	350075-087	NIPPLE, RGD, 3/4 X 7		62
AR	EA	350075-067	NIPPLE, RGD, 1/2 X 7		61
AR	EA	350075-050	NIPPLE, RGD, 1/2 X CHASE		60

QTY	U/M	PART NO.	DESCRIPTION		ITEM
132	EA	355119-001	RECEPT, 20A, 125V, SGL		58
11	EA	355096-520	RECEPT, 20A, 125V, DUP		57
3	EA	355098-120	SWITCH, 1P, 20A	S1,2,3	56
2	EA	355065-001	RECEPT, 20A, 125V, GFI	WR	55
AR	EA	350145-001	COVER, PL RING, +5/8"		53
AR	EA	350061-204	COVER, W/P, 1-DUPLEX GFCI		51
AR	EA	350006-001	COVER, 4 SQ, 1-DUP		50
AR	EA	350039-001	COVER, 4 SQ, DBL SW		49
AR	EA	350005-001	COVER, 4 SQ, SGL SW		48
AR	EA	350003-001	COVER, 4 SQ, BLANK		47
AR	EA	350004-001	COVER, 2-1/8, BLANK		46
AR	EA	350059-103	BOX, W/P, 5-1/2 KO		42
AR	EA	350001-002	BOX, 4 SQ X 2-1/8D, 1/2-3/4 KO		41
AR	EA	350002-001	BOX, 2-1/8 X 4, 1/2 KO		40
1	EA	350081-001	ENCLOSURE, 3R, 6 X 6 X 4		38
1	EA	350091-008	ENCLOSURE, N1, 12 X 12 X4		36
3	EA	350091-001	ENCLOSURE, N1, SC, 6 X 6 X 4		35
4	EA	I2R-ICP120V	SURGE PROTECTOR, 120V, MODULE		34
3	EA	DSWPH03	SURGE PROTECTION, 54V, 4 WIRE		33
1	EA	MC4000A	THERMOSTAT, 2STG, HT/COOL	T1	31
2	EA	265255-008	SLEEVE, A/C SUPPLY, 30x10x5-1/2		30
2	EA	360014-048	FLASHING, 48"		29
2	EA	DARH-30X16TB	GRILLE, AC, RETURN, 30x16		28
2	EA	DAH-30X10TB	GRILLE, AC, SUPPLY, 30x10		27
1	EA	W60A-A05XWXXXJ	A/C, WM, 57,000/5, 230V, W/RELAYS	ACH2	26
1	EA	W60L-A05XWXXXJ	A/C, WM, 57,000/5, 230V, W/RELAYS	ACH1	25
1	EA	BT2XPR	LIGHTNING ARRESTOR, 120/240V, 1ø/3W	LA1	23
1	EA	BT2XRR	LIGHTNING ARRESTOR, 120/240V, 1ø/3W	LA2	22
1	EA	400SN	NEUTRAL KIT,400A		20
1	EA	SN100FA	NEUTRAL KIT		19
1	EA	FA100S	CKT BKR ENCLOSURE	ECB2	18
1	EA	FAL22060	CKT BKR, 2/60A		17
1	EA	Q4L2400	CKT BKR, MOLDED CASE, 2/400A		16
1	EA	LA400S	ENCL CKT BKR, 400A, N1	ECB1	15
139	EA	QO120	CKT BKR, 1/20A		14
4	EA	PK23GTA	GROUND BAR KIT		13
1	EA	PK23GTA-2	GROUND BAR KIT		14
4	EA	QO140M200BE	LOAD CENTER,200A,1P/3W,MB,60Hz	UPSTP1-4	11
3	EA	QO260	CKT BKR, 2/60A		10
2	EA	QO2125	CKT BKR, 2/125A		9
1	EA	QO230	CKT BKR, 2/50A		8
2	EA	QO130	CKT BKR, 1/30A		7
2	EA	QO115	CKT BKR, 1/15A		6
1	EA	QO215	CKT BKR, 2/15A		5
1	EA	PK27GTA	GROUND BAR KIT		4
1	EA	MHC68VS	LOAD CENTER, COVER		3
1	EA	MH68	LOAD CENTER, ENCLOSURE		2
1	EA	QONQ42MS400	LOAD CENTER,400A,1P/3W,MB,60Hz	PP1	1

NOTES:

ITEMS ARE SUBJECT TO CHANGE DUE TO AVAILABILITY AND EQUAL SUBSTITUTES WILL BE USED. ELECTRICAL OR MECHANICAL REQUIREMENTS MAY CHANGE DUE TO MANUFACTURER'S SPECIFICATIONS.
AR = AS REQUIRED

* WHEN WAVEGUIDE OPTION IS TAKEN, ITEM #67 BECOMES 350075-109, DELETE (1) FROM ITEM #103, ADD ITEM #110, DELETE (1) FROM ITEM #104, DELETE (2) FROM ITEMS #101, #102, #144 & #145

** FIRE SUPPRESSION OPTION
ITEM 35 QTY CHANGES TO (4)
ITEM 210 PART # CHANGES TO AC-45C48X48
ITEM 209 PART # CHANGES TO AC-45C36X36
ITEM 191 QTY CHANGES TO (3)

*** WHEN BULLET RESISTANT DOOR OPTION IS TAKEN, ITEM #79 CHANGES TO 365340-002D, DELETE ITEM #80, ITEM #83 CHANGES TO 365020-004, ADD (1) TO ITEMS #91&216, ITEM #92 CHANGES TO 165290-336, ITEM #213 CHANGES TO 365340-005D, ITEM #215 CHANGES TO 165290-348.

REVISIONS			
CHG. BY	APPR. BY	DATE	REV
SFB	WEC	09/02/08	H
UPDATE WIREWAY			
SFB	WEC	06/10/09	J
UPDATE #31			
TJS	WEC	06/24/13	K
UPDATE ENTIRE PRINT			

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CHECKED BY	W.J.BLANKENSHIP	DATE 08/15/02
CHECKED BY	S.R.SHUMATE	DATE 08/15/02
DO NOT SCALE DRAWING		
SIZE B	CAGE NO. 53223	REV K
SCALE 1/4"=1'0"	MODEL 2506	

TITLE
11'8"X32'0"X9'2" CONC
MOTOROLA STANDARDS
BILL OF MATERIALS

DRAWING NO. 202506

SHEET 8 OF 15

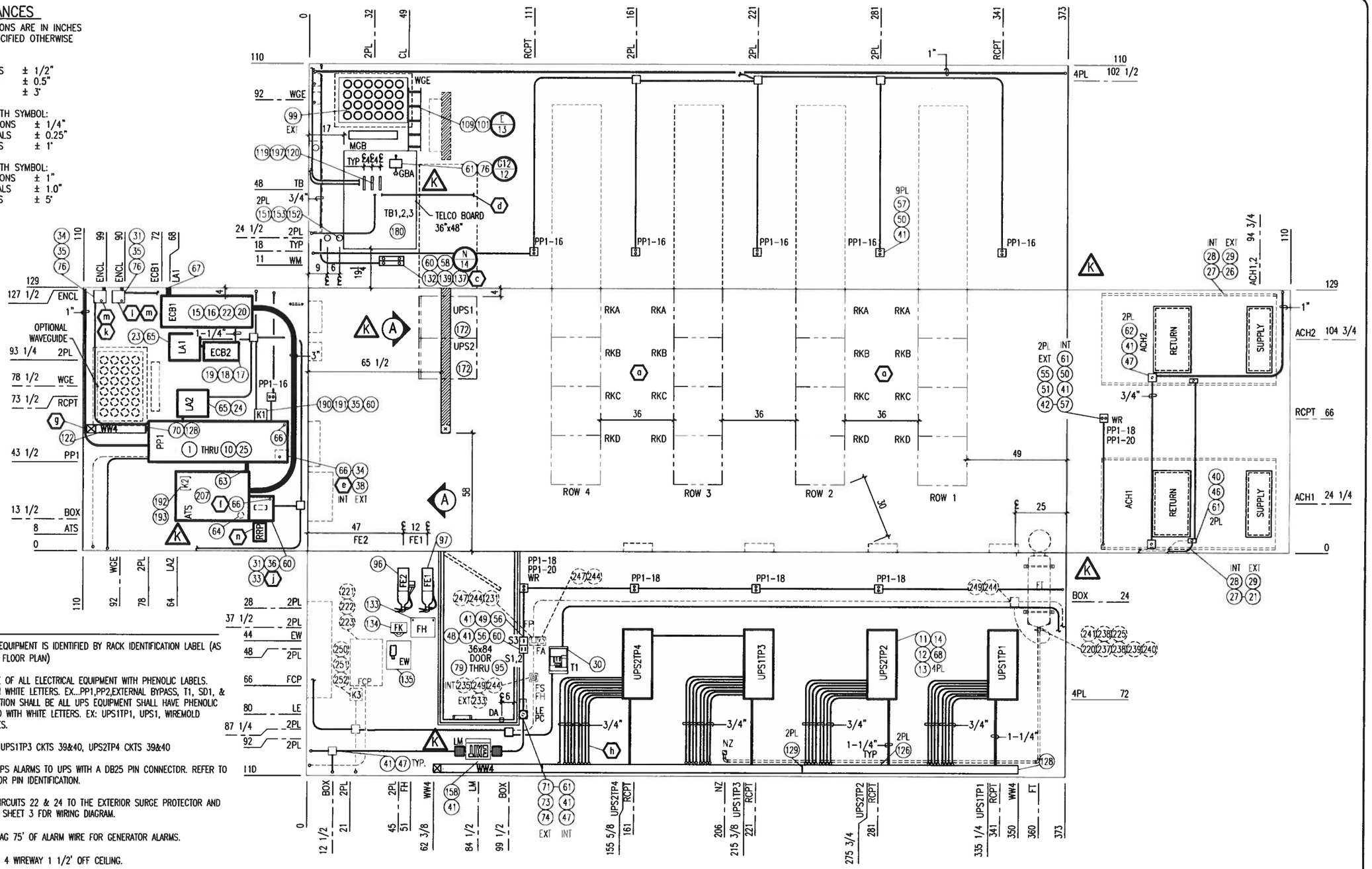
TOLERANCES

ALL DIMENSIONS ARE IN INCHES
UNLESS SPECIFIED OTHERWISE

STANDARD:
FRACTIONS ± 1/2"
DECIMALS ± 0.5"
ANGLES ± 3°

IF NOTED WITH SYMBOL:
▲ FRACTIONS ± 1/4"
DECIMALS ± 0.25"
ANGLES ± 1°

IF NOTED WITH SYMBOL:
● FRACTIONS ± 1"
DECIMALS ± 1.0"
ANGLES ± 5°



NOTES

(a) FRONT OF EQUIPMENT IS IDENTIFIED BY RACK IDENTIFICATION LABEL (AS SHOWN ON FLOOR PLAN)

b. LABEL FACE OF ALL ELECTRICAL EQUIPMENT WITH PHENOLIC LABELS. BLACK WITH WHITE LETTERS. EX...PP1,PP2,EXTERNAL BYPASS, T1, SD1, & LA1. EXCEPTION SHALL BE ALL UPS EQUIPMENT SHALL HAVE PHENOLIC LABELS RED WITH WHITE LETTERS. EX: UPS1TP1, UPS1, WIREMOLD RECEPTACLES.

(c) CIRCUITS: UPS1TP3 CKTS 39&40, UPS2TP4 CKTS 39&40

(d) CONNECT UPS ALARMS TO UPS WITH A DB25 PIN CONNECTOR. REFER TO SHEET 3 FOR PIN IDENTIFICATION.

(e) CONNECT CIRCUITS 22 & 24 TO THE EXTERIOR SURGE PROTECTOR AND LABEL. SEE SHEET 3 FDR WIRING DIAGRAM.

(f) COIL AND TAG 75' OF ALARM WIRE FOR GENERATOR ALARMS.

(g) MOUNT 4 X 4 WIREWAY 1 1/2' OFF CEILING.

(h) PLACE 3/4" CONDUIT FROM PANEL UPS2TP4 TO WIREMOLD ON UNISTRUT.

(j) CONNECT GENERATOR ALARMS TO SURGE PROTECTION MODULES. REFER TO SHEET 5 FOR WIRING DIAGRAM. ALL GENERATOR ALARMS SHALL CONNECT TO THE DSWPH03, EXCEPT FOR THE REMOTE START. THE REMOTE START SHALL CONNECT TO THE I2R-ICP48V MODULE.

(k) COIL AND TAG 12" OF #10 WIRE FOR CIRCUITS, PP1-2 & 4.

(l) COIL 12" OF ALARM WIRE FOR TOWER LIGHT ALARM. TB1-25 & 26.

(m) WHEN OPTIONAL WAVEGUIDE IS IMPLEMENTED NIPPLE THRU END WALL FOR TOWER LIGHT CONNECTION. SEE SHEET 6 FOR PART #.

(n) COIL 75' DF #18 AWG FOR GENERATOR CONTROL WIRE.

p. ALL CONDUIT SHALL HAVE COMPRESSION TYPE FITTINGS.

INTERIOR LAYOUT

REVISIONS			
CHG. BY	APPR. BY	DATE	REV
TKL	WJB	06/17/08	G
MOVE T1,CHANGE WIREWAY WITH CONDUIT,ADD CMPRSN FITTINGS			
SFB	WEC	02/09/06	H
UPDATE WIREWAY			
TJS		06/24/13	K
UPDATE ENTIRE PRINT			

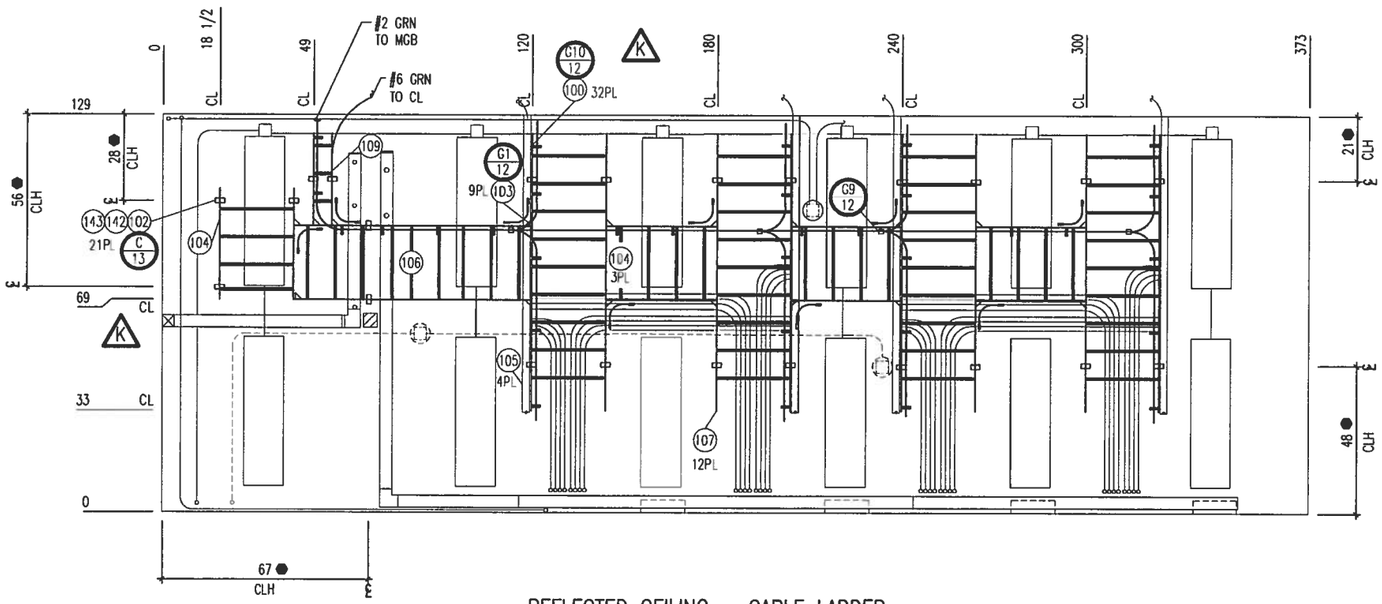
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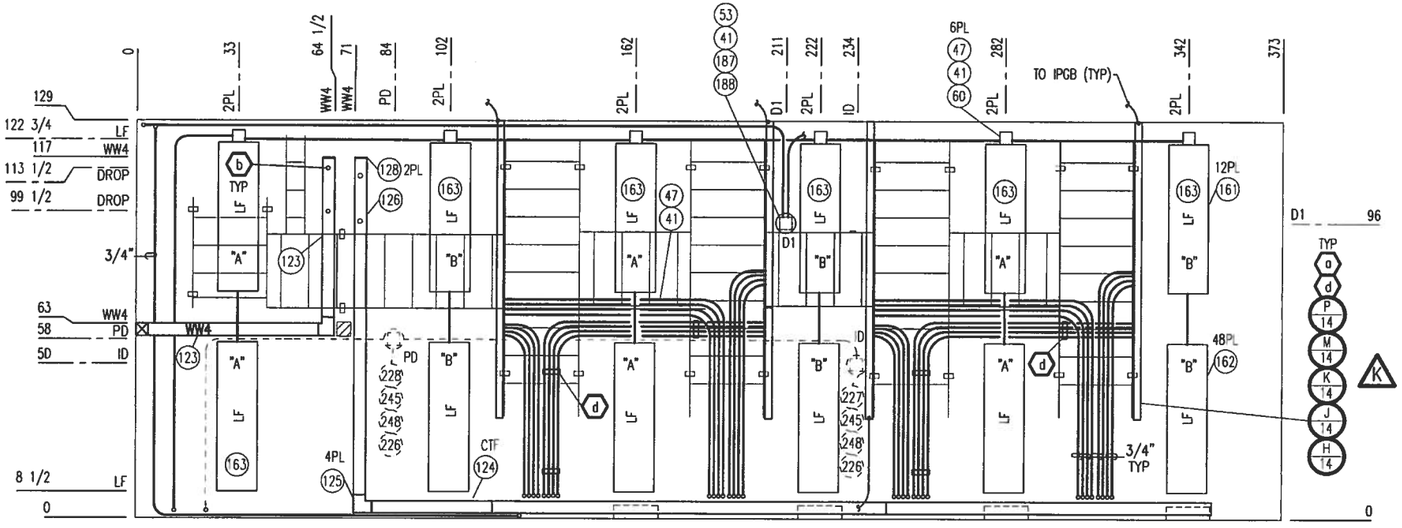
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CHECKED BY W.J.BLANKENSHIP	DATE 09/10/02
CHECKED BY S.R.SHUMATE	DATE 09/10/02
DO NOT SCALE DRAWING	
SIZE B	CAGE NO 53223 / REV K
SCALE 1/4"=1'0"	MODEL 2506
TITLE: 11'8"x32'0"x9'2" CONC MOTOROLA STANDARDS INTERIOR LAYOUT	
DRAWING NO. 202506	
SHEET 9 OF 15	



REFLECTED CEILING – CABLE LADDER



REFLECTED CEILING – ELECTRICAL

NOTES

(a) LIQUIDTITE TO WIREMOLD– SEE DETAIL "P" ON SHEET 13.

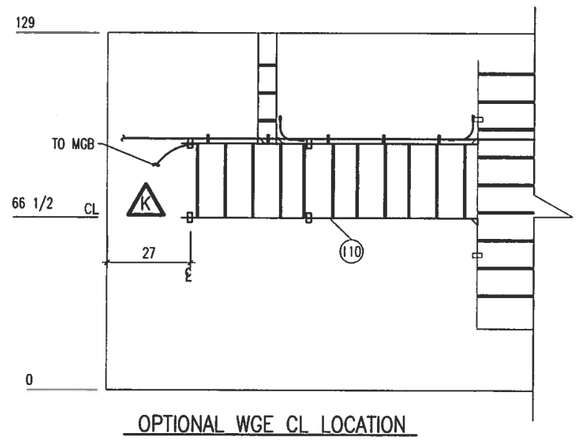
(b) 1-1/2" LTITE TO EXTERNAL BYPASS SWITCH.

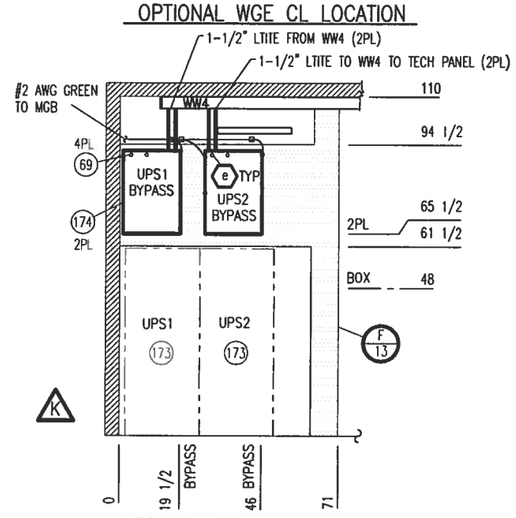
(c) RUN 3/4" CONDUITS FROM UPS2TP2 TO ROW 1 WIREMOLD & UPS2TP4 TO ROW 3 WIREMOLD ON UNISTRUT. ALL OTHER RUNS TO WIREMOLD SHALL BE MOUNTED TO THE WALL OR CEILING.

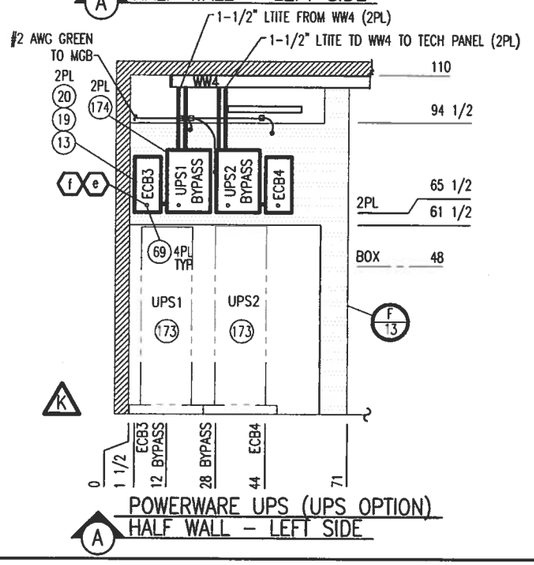
(d) CONDUIT SHALL LINE-UP WITH BLANK COVER PLATE IN WIREMOLD.

(e) NIPPLE THROUGH WALL AND CONNECT TO UPS WITH 90° CONNECTOR, AND 1-1/4" LTITE TO UPS. ALLOW 4FT EXTRA FOR MOVING OF THE UPS.

(f) ECB3 & ECB4 TO BE MOUNTED FLUSH WITH UPS BYPASSES ON HALF WALL WITH ONE LAYER EACH OF 1-1/2" & 3/4" UNISTRUT.







REVISIONS			
CHG. BY	APPR. BY	DATE	REV
TKL	TKL	06/17/08	G
RE-ROUTE CONDUIT, DELETE WW4			
SFB	WEC	09/02/08	H
RE-ROUTE CONDUIT, ADD WW4			
TJS		06/24/13	K
UPDATE ENTIRE PRINT			

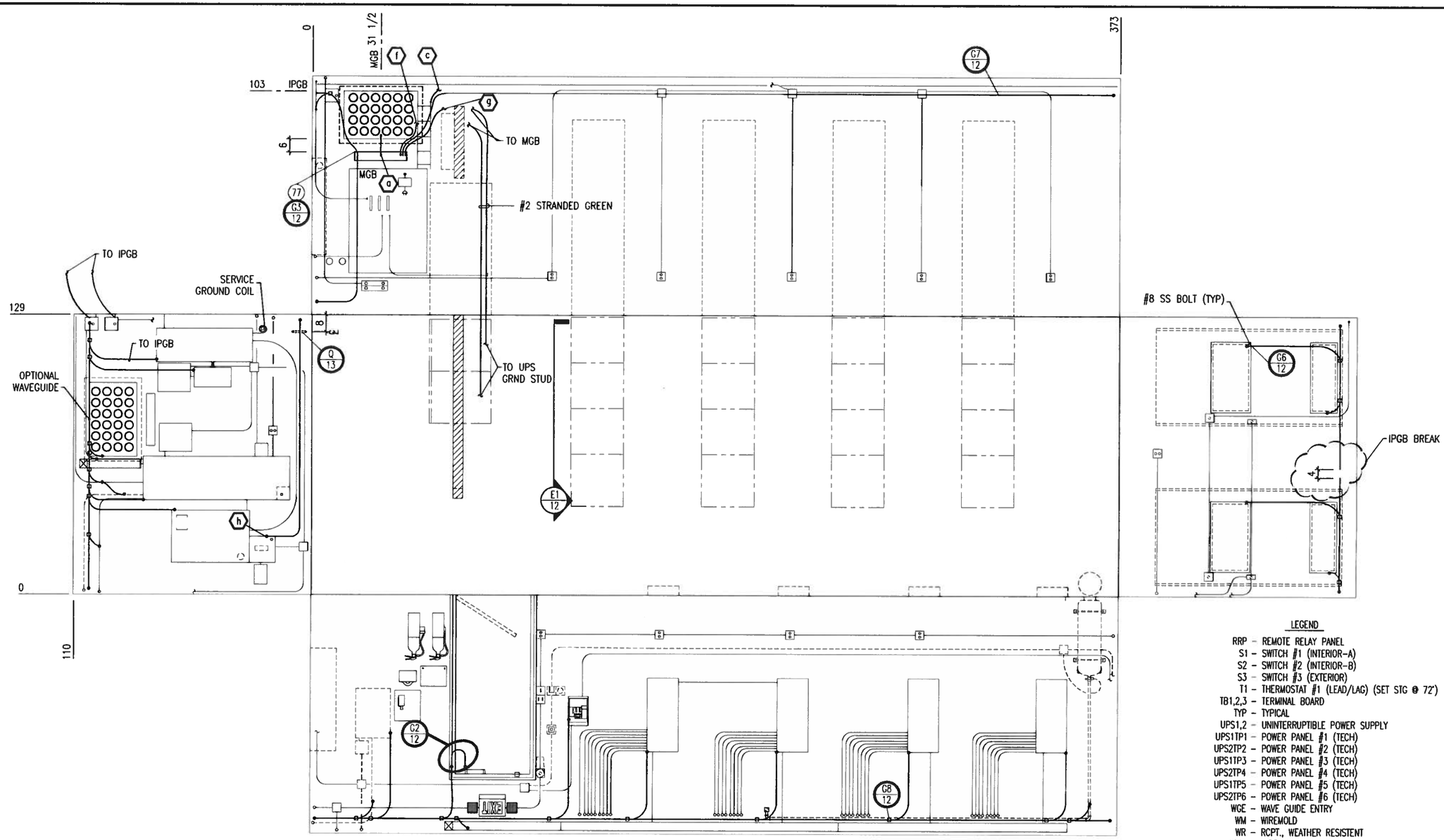
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CHECKED BY: S.R.SHUMATE	DATE: 09/10/02
DO NOT SCALE DRAWING	
SIZE: B	CAGE NO: 53223
REV: K	
SCALE: 1/4"=1'0"	MODEL: 2506
TITLE: 11'8"x32'0"x9'2" CONC MOTOROLA STANDARDS REFLECTED CEILING	
DRAWING NO.: 202506	
SHEET: 10 OF 15	



INTERIOR GROUNDING LAYOUT

(a) CONNECT WAVEGUIDE ENTRY TO MGB VIA #2 GRN WIRE WITH 2-HOLE LUGS.

b. WHEN EQUIPMENT IS LOCATED UNDER GROUND BAR, GROUND DIRECTLY TO THE GROUND BAR.

(c) GROUND CABLE TRAY DIRECTLY TO MGB FROM THE 6" WALL MOUNT CABLE TRAY.

d. WHEN WAVEGUIDE OPTION IS TAKEN, MAIN GROUND BAR AND ALL ASSOCIATED GROUNDING MOVE TO OPTIONAL LOCATION.

(e) INSTALL GBK14 TO SIDE OF ENCLOSURE WITH #10 BOLTS AND NUTS. (REMOVE PAINT AND USE NO-OX) GROUND EACH DSWPH03 TO GBK14. CONNECT #2 TO THE ENCLOSURE WITH 2-HOLE LUG (PLACE #2 AS CLOSE AS POSSIBLE TO THE #10 BOLTS) AND RUN AS SHOWN TO THE MGB AND CONNECT WITH A 2-HOLE LUG.

(f) #6 GRN FROM MGB TO CEILING CABLE TRAY

(g) #2 GRN FROM MGB TO CL FOR EQUIPMENT GROUND

(h) ALL CONDUITS THAT RUN PARALLEL TO AND ARE WITHIN 6" OF THE IPGB MUST BE BONDED TO THE IPGB

LEGEND

ACH1 – AIR CONDITIONER/HEATER #1
ACH2 – AIR CONDITIONER/HEATER #2
ATS – AUTOMATIC TRANSFER SWITCH
CFE – CUSTOMER FURNISHED EQUIPMENT
CL – CABLE LADDER
CLH – CABLE LADDER HANGER
CTF – CUT TO FIT
D1 – SMOKE DETECTOR
DA – DOOR ALARM
ECB1 – ENCLOSED CIRCUIT BREAKER (MAIN)
ECB2 – ENCLOSED CIRCUIT BREAKER (LIGHTNING ARRESTOR)
ECB3 – ENCLOSED CIRCUIT BREAKER (UPS1)
ECB4 – ENCLOSED CIRCUIT BREAKER (UPS2)
EME – ELECTRO EMISSION WARNING SIGN
EW – EYE WASH
FE1,2 – FIRE EXTINGUISHER
FH – FILE HOLDER
FK – FIRST AID KIT

LEGEND

GBA – GROUND BAR ALARM KIT
HTA – HIGH TEMPERATURE ALARM (SET @ 85')
K1 – SITE POWER FAIL RELAY
K2 – COMMERCIAL POWER FAIL RELAY
LA1 – LIGHTNING ARRESTOR MOV
LA2 – LIGHTNING ARRESTOR MOV/SAD
LE – LIGHT EXTERIOR
LF – LIGHT FLUORESCENT
LM – LIGHT EMERGENCY
LTA – LOW TEMPERATURE ALARM (SET @ 50')
MGB – MAIN GROUND BAR
MTS – MANUAL TRANSFER SWITCH
PC – PHOTOCELL
PFA – SITE POWER FAIL ALARM
PL – PLACES
PP1 – POWER PANEL #1 (UTILITY)
RK – RACK (EQUIPMENT)
RCPT – RECEPTACLE

LEGEND

RRP – REMOTE RELAY PANEL
S1 – SWITCH #1 (INTERIOR-A)
S2 – SWITCH #2 (INTERIOR-B)
S3 – SWITCH #3 (EXTERIOR)
T1 – THERMOSTAT #1 (LEAD/LAG) (SET STG @ 72')
TB1,2,3 – TERMINAL BOARD
TYP – TYPICAL
UPS1,2 – UNINTERRUPTIBLE POWER SUPPLY
UPS1TP1 – POWER PANEL #1 (TECH)
UPS2TP2 – POWER PANEL #2 (TECH)
UPS1TP3 – POWER PANEL #3 (TECH)
UPS2TP4 – POWER PANEL #4 (TECH)
UPS1TP5 – POWER PANEL #5 (TECH)
UPS2TP6 – POWER PANEL #6 (TECH)
WGE – WAVE GUIDE ENTRY
WM – WIREMOLD
WR – RCPT., WEATHER RESISTENT
WW4 – WIREWAY, 4 x 4 SQ.
[S] – RCPT., DUPLEX
□ – JUNCTION BOX, 4 X 4
▯ – JUNCTION BOX, 2 X 4
(nn) – REF PART LIST ITEM NUMBER
(n) – REF DWG NOTE

(A) – DELTA REVISION

FIRE SUPPRESSION LEGEND

FA – ABORT STATION
FB – BELL
FCP – CONTROL PANEL
FS – STROBE
FT – TANK
K3 – RELAY (FIRE SYS. SHUTDOWN)
NZ – NOZZLE ,180'
PD1,2 – DETECTOR (PHOTO)

REVISIONS			
CHG. BY	APPR. BY	DATE	REV
TKL	WJB	06/18/08	G
ADD COMPRESSION FITTINGS			
SFB	WEC	09/02/08	H
ADD WIREWAY			
TJS		06/24/13	K
UPDATE ENTIRE PRINT			

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CHECKED BY S.R.SHUMATE	DATE 09/10/02
DO NOT SCALE DRAWING	
SIZE B	CAGE NO 53223 / REV K
SCALE 1/4"=1'0"	MODEL 2506

TITLE
11'8"x32'0"x9'2" CONC
MOTOROLA STANDARDS
INTERIOR GROUNDING

DRAWING NO. 202506

SHEET 11 OF 15