



**CITY OF FORT LAUDERDALE
ENGINEERING DIVISION
APPLICATION TO INSTALL AT GRADE
COMMUNICATIONS SERVICE FACILITIES**

**PERMIT NO. CC13-03
District 2**

Robinson *Rev'd 9/24/13*
08-2nd
1200
100
old HOLD -
Needs Robinson
In middle of
side walk

Applicant Name and Job Number Crown Castle SFL 60_3

Job Address and Location 550 SE 21st Street

Description of Work Installing cabinet and utility pole within right-of-way.

Anticipated start and end dates of work 11/4/13 - 45 days

- This permit application is for an exemption from the requirement to install communications service facilities below grade, in accordance with Section 25-100.1.B.3 of the City of Fort Lauderdale Code of Ordinances (Code). A letter by a qualified expert(s) is attached.
- Crown Castle is requesting the following waivers (check all applicable subsections and attach supporting documentation):

- C.1 (Size)
- C.2 (Height)
- C.3 (Front Yard)
- C.4 (Corner Yard)
- C.6 (Separation)
- C.7 (Exist. Facility)
- C.12 (Collector)

- With the exception of any waivers that may be checked above, the proposed at grade facilities conform to the requirements in Section 25-100.1 of the Code
- Notice of the pending application has been provided to all property owners abutting public rights-of-way within one hundred fifty (150) feet of the proposed site and to the relevant homeowner association, in accordance with Section 25-100.1.E.5 of the Code.
- The proposed site will be maintained by Crown Castle in accordance with the approved Graffiti Mitigation Plan dated 04/04/2013, which is on file with the City Engineer
- A landscaping maintenance commitment letter from the adjacent property owner and relevant home owner association is attached to this application.
- Crown Castle shall be responsible for maintaining landscaping
- The proposed at grade facilities depicted on the attached plans are completely located in the public rights-of-way.

As an authorized representative of Crown Castle, I certify under oath that the forgoing statements are true and correct.

Armando Hernandez Printed Name of Authorized Crown Castle Agent
Armando Hernandez Signature of Authorized Crown Castle Agent

Sworn to and subscribed before me this 24 day of Sept, 2013
My Commission Expires 9-3-16

Shane Hafner Notary Public, State of Florida
(Seal)

(Do not write below this line)

Conceptual approval date _____ by _____, Subject to the following conditions:

- 1) A detailed visual mitigation plan is required

Final Permit approval date _____ by _____ Final Inspection date _____ by _____

**Notify Engineering Permits Division 24 hours prior to starting work at (954) 828-5649

REVIEW CHECKLIST FOR CABINETS IN RIGHTS-OF-WAY

Permit No. **CC13 - 03**

- Application Package complete – 3 sets (JJ)**
 - Verified addresses of property owners and HOA to which notice was provided
 - Random audit of package to property owners
 - Feasibility letter, site plan, landscaping plan, aerial photo, 5 pictures
 - Easement and property information provided
- CC memo provided to Commission (JJ)**
- 15-Day Call up Memo to Commission (JJ)**

Criteria for cabinets in Rights-of-Way

	Plan Review Checklist	Comments
<input type="checkbox"/>	Evaluation and approval of any waivers identified on application (size, height, corner yard, > 3 cabinets per block, modification of existing cabinet, conflict with future sidewalk)	
<input checked="" type="checkbox"/>	Sum of H + W + L not greater than 124" and H not greater than 5'-8"	
<input checked="" type="checkbox"/>	Cabinet not in front yard	
<input type="checkbox"/>	Proposed landscaping is in accordance with plan on file with City	
<input type="checkbox"/>	If landscaping is to be maintained by Property Owner, Agreement has been provided	
<input type="checkbox"/>	Landscaping plan has been checked by Dave Genarro	
<input checked="" type="checkbox"/>	New cabinet is at least 2 feet from other cabinets, poles, etc.	
<input checked="" type="checkbox"/>	Cabinet not in sight triangle (sight triangle may be reduced to 10 feet)	
<input checked="" type="checkbox"/>	ADA requirements met	
<input checked="" type="checkbox"/>	Roadside recovery setback met (per Florida Green Book)	
<input checked="" type="checkbox"/>	Cabinet/landscaping is at least one foot from sidewalk	
<input checked="" type="checkbox"/>	Cabinet would not conflict with future sidewalk	
<input checked="" type="checkbox"/>	Field face cabinet to R/W	
	Field Inspection Checklist	Comments
<input type="checkbox"/>	Type and location of topographic features shown on permit plan are consistent with field conditions	
<input type="checkbox"/>	H + W + L not greater than 124" and H not greater than 5'-8"	
<input type="checkbox"/>	There are no conflicts with existing utility lines and new cabinet location would not hinder access to utilities or be within excavation trench over the pipe	
<input type="checkbox"/>	New cabinet is at least 2 feet from other cabinets, poles, etc.	
<input type="checkbox"/>	New cabinet is not in sight triangle – visual check performed in field	
<input type="checkbox"/>	ADA requirements met – minimum clearances/slopes measured	
<input type="checkbox"/>	Roadside recovery setback measured	
<input type="checkbox"/>	Cabinet/landscaping (measured) is at least one foot from sidewalk	
<input type="checkbox"/>	Landscaping is per permit plans and effectively screens cabinet	
<input type="checkbox"/>	Cabinet would not conflict with future sidewalk	
<input type="checkbox"/>	Dimensions for cabinet location measured	
<input type="checkbox"/>	Not more than three communication cabinets per block (unless waiver approved)	
<input type="checkbox"/>	Electrical Permit – Final inspection passed	

TEMPORARY MODIFICATION OF TRAFFIC (MOT) ROUTING FORM

DATE: 9/25/13

APPLICANT/ADDRESS/PHONE:
Crown Castle NG East, Inc.
8555 NW 64th Street
Miami, Fl. 33166
813-447-0333

PERMIT NO. _____
(PROVIDED BY CITY AT TIME OF PERMIT APPLICATION)

PROJECT NAME/ADDRESS: **SFL 60_3**

- This routing form should be completed and submitted as an attachment to the above-referenced permit (hereinafter "PERMIT").
- Obtaining signatures on this routing form does not constitute any approvals by the City. The MOT may be implemented only after issuance of the PERMIT, subject to satisfaction of all prerequisite conditions.
- This form is for MOT's within rights-of-way under City of Fort Lauderdale's jurisdiction. If the MOT or detour routes affect rights-of-way under Broward County jurisdiction, the County's form (available on the City website) should also be completed with the required signatures and attached. If the detours affect FDOT right-of-way, a permit from FDOT must be attached.
- If work is taking place in County or FDOT R/W, an MOT permit is not required from the City. However, PERMIT applicant (hereinafter APPLICANT) is asked to provide two weeks advance notice of any closures or detours to the City's Public Information Office.

Specific dates and times requested for MOT implementation:

Begin _____ End _____

Describe Work, including location of site and address, names of affected streets, why MOT is necessary, nature of the construction, deliveries, staging areas, if cranes will be used, etc. (staging and storage of materials/equipment are not permitted in the right-of-way). Please note if additional sheets have been attached for the description of work.

550 SE 21st Street approximately 80' West of S. Federal Hwy. . Work on shoulder and sidewalk closure. Place new telecommunications cabinet and new 45' wood utility pole. Attach Crown Castle antenna to new 45' wood utility pole.

Describe MOT, the number of lanes affected on each street, if metered parking spaces will be displaced, if detours are necessary, if flagmen will be provided, if MOT will be full-time (or times of day the MOT is to be in effect) and any other special considerations related to this request. Please note if additional sheets have been attached for the description of MOT.

FDOT 602 & 660. Daily work hours 8am - 4pm.

Attach: MOT plan prepared by a certified worksite traffic control technician or traffic control supervisor (as appropriate for the complexity of the job), with a copy of current certification.

If implementation of an approved PERMIT is found to adversely affect public safety and/or public convenience or there is a conflict with a higher public purpose, the APPLICANT may be required to modify the MOT plan or the PERMIT may be temporarily suspended or permanently revoked at any time with reasonable notice from the City.

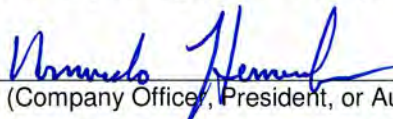
The MOT plan shall be in accordance with provisions of the latest edition of Part IV of the Manual of Uniform Traffic Control Devices for Streets and Highways and FDOT Design Standards. Compliance with the requirements of the approved plan shall be the responsibility of the APPLICANT.


(APPLICANT)

Armando Hernandez / Site Development Manager
(Print Name/Title)

As a consideration for the permission granted herein, **Armando Hernandez** (APPLICANT) agrees to indemnify and hold harmless the City of Fort Lauderdale for any damages, claims or injuries that may result from the MOT plan approved under the PERMIT.

Crown Castle NG East, Inc.
(Name of Company)

By: 
(Company Officer, President, or Authorized Agent)

Project Name: _____ PERMIT NUMBER: _____

Applicant should collect the signatures in this section (if required). To expedite processing, signatures may be requested concurrently via fax or pdf and provided on separate copies of this page.

(Date)

Police Department (Patrol Secretary Office)

(Required only if MOT includes a detour for any direction of travel)
1300 West Broward Boulevard
Tel.: (954) 828-5477 (call for appointment)

(Date)

Fire-Rescue Department

(Required only if MOT includes a detour for any direction of travel)
Bill Findland, Assistant Chief
528 NW 2nd Street
Tel.: (954) 828-4351 (call for appointment); Fax: (954) 828-6843

(Date)

Maj Shakib/ Studies Section

(Required only if MOT/detour affects County road or intersection)
2300 W. Commercial Boulevard
(Please call (954) 847-2655 for appt. Walk-ins NOT accepted)

After above signatures are collected, Applicant should forward the MOT Plan and this routing form to the person listed below.

(Date)

Transportation and Mobility

Heslop Daley, Project Engineer
290 NE 3rd Avenue
Tel: (954) 828-5734 Fax: (954) 828-3734

City Manager's signature to be requested by City Staff only (if signature is required)

(Date)

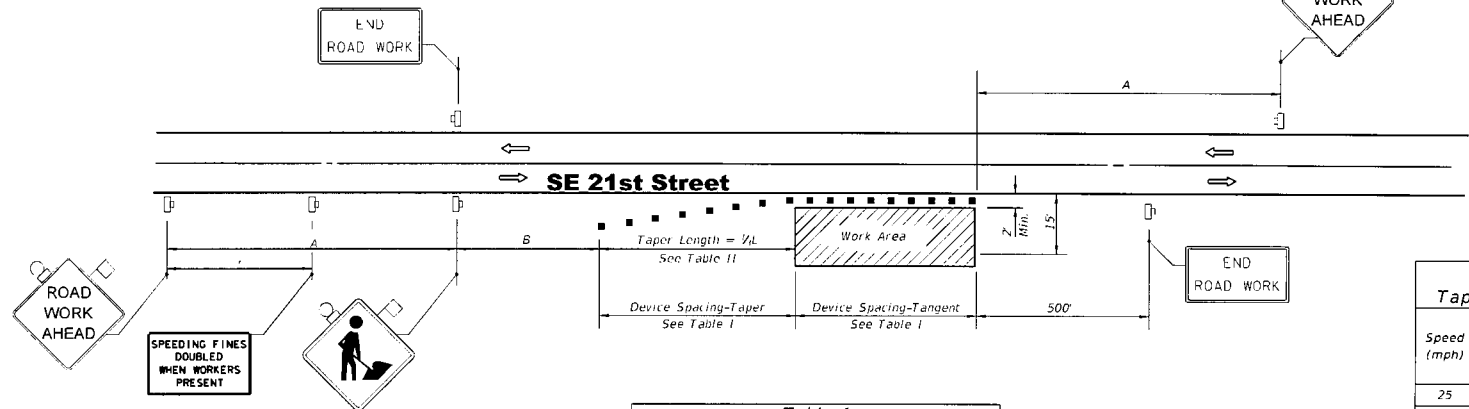
City Manager's Office

Lee R. Feldman, ICMA-CM, City Manager
100 N. Andrews Avenue, 7th Floor
Tel.: (954) 828-5013 or Fax: (954) 828-5121

A copy of the PERMIT, this routing form and MOT shall be kept on-site and made available to the City inspector at all times.

This form is for MOT plans associated with private utility projects and private development projects. MOT plans for City Capital Improvement Projects shall be coordinated through Engineering Inspection or the Project Manager. Traffic modifications required for special events shall be arranged through the City's Special Events Coordinator, Jeff Meehan at (954) 828-6705.

NORTH



Speed	Spacing (ft.)	
	A	B
40 mph or less	200	200
45 mph	350	350
50 mph or greater	500	500

*Midway between signs.

Speed (mph)	Max. Distance Between Devices (ft.)			
	Cones or Tubular Markers		Type I or Type II Barricades or Vertical Panels or Drums	
	Taper	Tangent	Taper	Tangent
25	25	50	25	50
30 to 45	25	50	30	50
50 to 70	25	50	50	100

Speed (mph)	1/2 L (ft.)			Notes
	8' Shldr.	10' Shldr.	12' Shldr.	
25	28	35	42	L = WS' / 60
30	40	50	60	
35	55	68	82	
40	72	90	107	
45	120	150	180	L = WS
50	133	167	200	
55	147	183	220	
60	160	200	240	
65	173	217	260	
70	187	233	280	

8' minimum shoulder width

1/2 L = Length of shoulder taper in feet

W = Width of total shoulder in feet (combined paved and unpaved width)

S = Posted speed limit (mph)

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Channelizing Device (See Index No. 600)
- Work Zone Sign
- Lane Identification + Direction of Traffic

GENERAL NOTES

1. When four or more work vehicles enter the through traffic lanes in a one hour period or less (excluding establishing and terminating the work area), the advanced FLAGGER sign shall be substituted for the WORKERS sign. For location of flaggers and FLAGGER signs, see Index No. 603.
2. SHOULDER WORK sign may be used as an alternate to the WORKER symbol sign only on the side where the shoulder work is being performed.
3. When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes.
4. For general TCZ requirements and additional information, refer to Index No. 600.

DURATION NOTES

1. Signs and channelizing devices may be omitted if all of the following conditions are met:
 - a. Work operations are 60 minutes or less.
 - b. Vehicles in the work area have high-intensity, rotating, flashing, oscillating, or strobe lights operating.

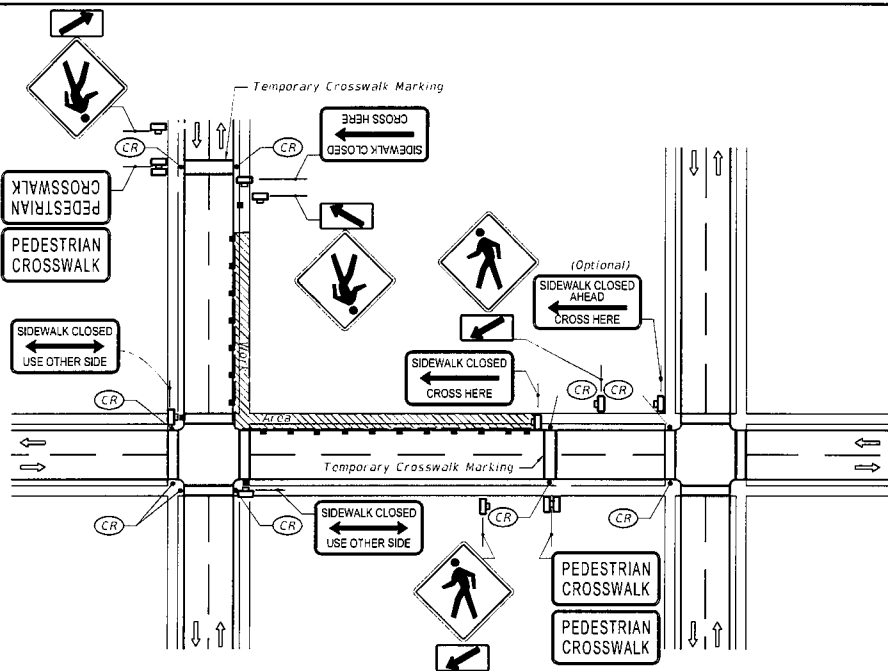
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA CLOSER THAN 15' BUT NOT CLOSER THAN 2' TO THE EDGE OF TRAVEL WAY.

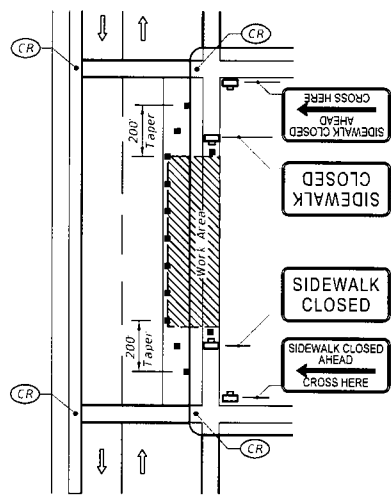
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LAST REVISION 07/01/12	DESCRIPTION: REVISION		FDOT DESIGN STANDARDS 2013	TWO-LANE, TWO-WAY, WORK ON SHOULDER	INDEX NO. 602	SHEET NO. 1
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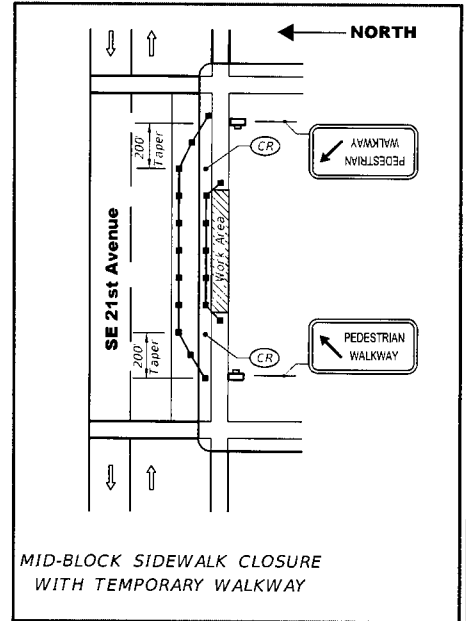
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CORNER SIDEWALK CLOSURE WITH TEMPORARY CROSSWALKS



MID-BLOCK SIDEWALK CLOSURE



MID-BLOCK SIDEWALK CLOSURE WITH TEMPORARY WALKWAY

GENERAL NOTES

1. Only the signs controlling pedestrian flows are shown. Other work zone signs will be needed to control traffic on the streets.
2. For spacing of traffic control devices and general TCZ requirements refer to Index No. 600. Maximum spacing between barricades, vertical panels, drums or tubular markers shall not be greater than 25'.
3. Street lighting should be considered.
4. For nighttime closures use Type A flashing warning lights on barricades supporting signs and closing sidewalks. Use Type C steady-burn lights on channelizing devices separating the work area from vehicular traffic.
5. Pedestrian traffic signal display controlling closed crosswalks shall be covered or deactivated.
6. Post Mounted Signs located near or adjacent to a sidewalk shall have a 7' minimum clearance from the bottom of sign to the sidewalk.
7. When construction activities involve sidewalks on both sides of the street, efforts should be made to stage the construction so that both sidewalks are not out of service at the same time.
8. In the event that sidewalks on both sides of the street are closed, pedestrians shall be guided around the construction zone.
9. Temporary walkways shall be a minimum of 4' wide with a maximum 0.02 cross slope and a maximum 0.05 running slope between ramps. Temporary walkways less than 5' in width shall provide for a 5' x 5' passing space at intervals not to exceed 200'. Temporary ramps shall meet the requirements for curb ramps specified in Index No. 304. Temporary walkway surfaces and ramps shall be stable, firm, slip resistant, and kept free of any obstructions and hazards such as holes, debris, mud, construction equipment, stored materials, etc.
10. Temporary ramps and temporary crosswalk markings shall be removed with reopening of the sidewalk, unless otherwise noted in the plans. All work and materials associated with constructing temporary curb ramps and temporary crosswalk markings, removal and disposal of temporary curb ramps and temporary crosswalk markings, and restoration to original condition shall be paid for as Maintenance of Traffic, Lump Sum.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT WORKERS OR THEIR ACTIVITIES ENCR OACH ON THE SIDEWALK FOR A PERIOD OF MORE THAN 60 MINUTES.

SYMBOLS

- Work Area
- Channelizing Device (See Index No. 600)
- Work Zone Sign
- Required Locations For Either Temporary Or Permanent Curb Ramps.
- Lane Identification + Direction of Traffic
- Pedestrian Longitudinal Channelizing Device

LAST REVISION	07/01/12	REVISION	DESCRIPTION:	FDOT DESIGN STANDARDS 2013	PEDESTRIAN CONTROL FOR CLOSURE OF SIDEWALKS	INDEX NO.	SHEET NO.
						660	1



Crown Castle
8555 NW 64th Street
Miami, Florida 33166-2628
MelissaP.Anderson@crowncastle.com

Office 786-899-5911
Mobile 561-310-9261
Fax 305-591-1469
www.crowncastle.com

April 4, 2013

City Engineer
City of Ft. Lauderdale
100 N. Andrews Avenue
Ft. Lauderdale, Florida 33301

Re: Crown Castle NG East Inc. Application for Exemption from Below Grade Requirement

Dear City Engineer:

In accordance with Section 25-100.1(b) of the city's Communications Rights-of-Way Ordinance (the "Ordinance"), Crown Castle NG East Inc. ("Crown Castle") submits this application for an exemption from the below grade requirement. As is set forth in the attached letter from Wayne Waldron, Director of Implementation for Crown Castle in the Southeastern Region, an exemption is appropriate, as a hardship would result from the imposition of the requirement. Placing the communications service facility described in the attached right-of-way permit application ("Facility") below grade is: 1. technologically infeasible; 2. a below grade facility is not available in the marketplace; and 3. all reasonable alternatives have been exhausted.

Given that Crown Castle has shown by a preponderance of the evidence that a hardship would result if an exemption were not granted, Crown Castle requests that City Engineer grant an exemption from Section 25-100.1(b) of the city's code.

Very Truly Yours,

A handwritten signature in black ink, appearing to be 'MPA', with a long horizontal line extending to the right.

Melissa P. Anderson
Government Relations Counsel
Southeastern Region

cc: Wayne Waldron, Director of Implementation

ATTACHMENT 1
Certification in Support of Application to City of Ft. Lauderdale for
Exemption from Below Grade Requirement

My name is Wayne W. Waldron and my title with Crown Castle is Director of Implementation for the Southeastern Region.

My background and experience in the telecommunications field is as follows: Prior to joining Crown Castle served as Division Manager of 7 state Southwest Division for utility construction (telephone, electric, water, gas, sewer, CATV) firm Henkels and McCoy, Inc. of Blue Bell PA for 10 years, Operations Controller managing Long Island Sound Crossing project for Pirelli Cable Systems of Florham Park NJ for 3 years, Vice President of Liberty General Contracting providing utility construction services in Pottstown PA for 4 years, Vice President of Construction and Engineering for RCN Corporation of Princeton NJ overseeing installation of fiber cabling for telephone, CATV and internet services for 7 years.

My education and training includes but is not limited to: Received Bachelors of Science in Business Administration with a major in Accounting from Temple University in 1980. I have taken continuing education courses in Fiber Optic Technology from Oklahoma State University, Effective Management from Harvard University, Electrical Design from University of Texas Arlington.

Given my education, background and experience, I am an expert regarding communications equipment and, in particular, regarding the communications equipment necessary for Crown Castle to pursue the current planned installation of a DAS network in Ft. Lauderdale. The communications service facility (Facility) that is described in the attached right-of-way permit application is necessary for the current DAS network. The Facility will house active electronics. Based upon my expertise, I hereby certify that placing the Facility below grade is technologically infeasible, that a below grade facility is not available in the marketplace and that all reasonable alternatives have been exhausted. Accordingly, Crown Castle requests an exemption from the below grade requirement contained in Section 25-100.1(b) of the city's code.



Wayne W. Waldron
Director of Implementation
Southeastern Region

Crown Castle NG East Inc. Graffiti Mitigation Plan

Pursuant to the City of Ft. Lauderdale's Communications Service Facility Right-of-Way Ordinance No. C-07-108, this Graffiti Mitigation Plan describes how Crown Castle NG East Inc. ("Crown Castle") will maintain communications service facilities governed by the Ordinance free from graffiti, including inspecting them no less frequently than every 90 days and removing graffiti within 7 working days from receipt of notice thereof from the City.

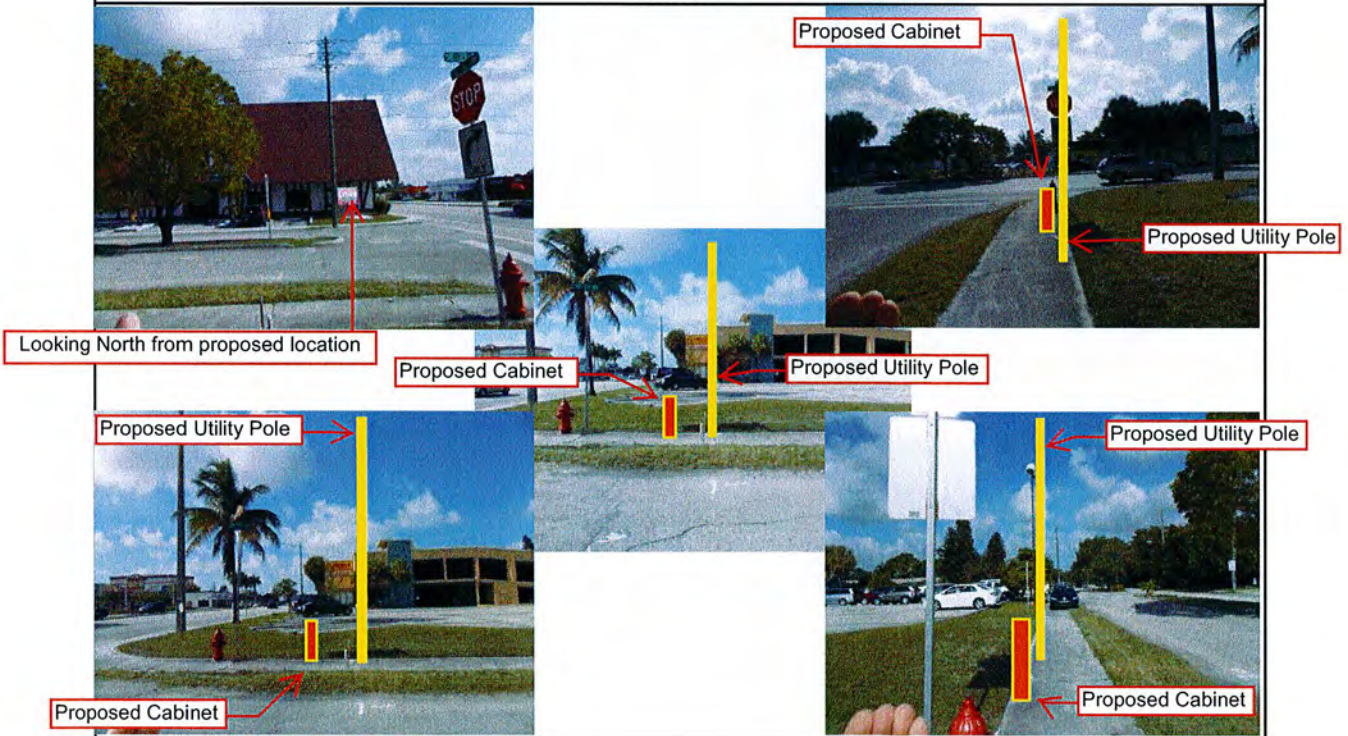
Crown Castle removes graffiti found on its equipment cabinets, including when graffiti is found by Crown Castle personnel or brought to Crown Castle's attention by other parties. Crown Castle removes graffiti with either mineral spirits or paint thinner. A rag is soaked with the solvent and rubbed lightly over graffiti. The solvents will remove spray paint and permanent marker, which are the most difficult forms of graffiti to remove. In cases where the graffiti cannot be cleaned or where Crown Castle determines that paint is the better option, matching paint is applied. The Crown Castle contact person for graffiti issues is Armando Hernandez. His contact information is: office: 786 899-5914 Cell: 813 447-0333.



Crown Castle Node Survey Sheet

Customer:	MetroPCS	Candidate Letters	m2
Project:	South Florida	Date	7/29/2013
Polygon:	60		
Polygon_Node:	60_3		
Latitude:	26.09555		
Longitude:	-80.13688		
Street Address:	598 SE 21st St, Fort Lauderdale, FL 33316		
On Street:	SE 21st St.		
Cross Street 1:	SE 21st St.		
Cross Street 2:	US 1		
City, Florida:	Fort Lauderdale		
Pole ID:	New		
Antenna Height:	38ft		
Power on Pole:	If no secondary, how far to secondary? _____		
Telco on Pole:	If no telco, how far to pole with telco? _____		
Pole Type:	Wood	New Pole	Pole Owner: CCI Pole size: 45 ft
Pole Access:			
Photo of Pole:	If yes, photo #s? _____		
Pole marked:			
Pole Location Description:	_____		
Equipment on Pole:	_____		
Comments:	Equipment on ground		

Photos



September 25, 2013

**Notice of Right-of-Way Permit Application
Submitted to City of Ft. Lauderdale**

D A Realty Holdings of South Florida LLC,

This letter is to inform you that Crown Castle NG East Inc. has submitted a right-of-way permit application to the City of Ft. Lauderdale for the placement of a communications facility in City rights-of-way adjacent to the following property address: 550 SE 21st Street Fort Lauderdale , Fl. 33316

Crown Castle NG East Inc. is sending this notice to you as provided in City Ordinance No. C-07-108, which requires that notice of right-of-way permit application for the communications facility be provided to certain parties in the vicinity of the right-of-way.

A drawing showing the proposed placement and location is attached. The permit application may be reviewed at the City engineer's Office located at City Hall 100 N. Andrews Avenue.

The communications facility will enable Crown Castle NG East Inc. to offer new and enhanced communications services to customers in your neighborhood.

If you have any questions, please feel free to contact me at (305) 728-0154

Sincerely,

Armando Hernandez

Site Development Manager

Crown Castle NG East Inc.

September 25, 2013

**Notice of Right-of-Way Permit Application
Submitted to City of Ft. Lauderdale**

Grif-Ko Apartments Inc.,

This letter is to inform you that Crown Castle NG East Inc. has submitted a right-of-way permit application to the City of Ft. Lauderdale for the placement of a communications facility in City rights-of-way adjacent to the following property address: 550 SE 21st Street Fort Lauderdale , Fl. 33316

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Sincerely,

Armando Hernandez

Site Development Manager

Crown Castle NG East Inc.

September 25, 2013

**Notice of Right-of-Way Permit Application
Submitted to City of Ft. Lauderdale**

John Paul Alt,

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Sincerely,

Armando Hernandez

Site Development Manager

Crown Castle NG East Inc.

September 25, 2013

**Notice of Right-of-Way Permit Application
Submitted to City of Ft. Lauderdale**

John Robichaud,

This letter is to inform you that Crown Castle NG East Inc. has submitted a right-of-way permit application to the City of Ft. Lauderdale for the placement of a communications facility in City rights-of-way adjacent to the following property address: 550 SE 21st Street Fort Lauderdale , Fl. 33316

Crown Castle NG East Inc. is sending this notice to you as provided in City Ordinance No. C-07-108, which requires that notice of right-of-way permit application for the communications facility be provided to certain parties in the vicinity of the right-of-way.

A drawing showing the proposed placement and location is attached. The permit application may be reviewed at the City engineer's Office located at City Hall 100 N. Andrews Avenue.

The communications facility will enable Crown Castle NG East Inc. to offer new and enhanced communications services to customers in your neighborhood.

If you have any questions, please feel free to contact me at (305) 728-0154

Sincerely,

Armando Hernandez

Site Development Manager

Crown Castle NG East Inc.

September 25, 2013

**Notice of Right-of-Way Permit Application
Submitted to City of Ft. Lauderdale**

Poinciana Park Civic Association,

This letter is to inform you that Crown Castle NG East Inc. has submitted a right-of-way permit application to the City of Ft. Lauderdale for the placement of a communications facility in City rights-of-way adjacent to the following property address: 550 SE 21st Street Fort Lauderdale , FL. 33316

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Armando Hernandez

Site Development Manager

Crown Castle NG East Inc.

September 25, 2013

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Submitted to City of Ft. Lauderdale**

Shelly & Michael Dicondina,

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Site Development Manager

Crown Castle NG East Inc.

September 25, 2013

**Notice of Right-of-Way Permit Application
Submitted to City of Ft. Lauderdale**

Element Three Inc.,

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Sincerely,

Armando Hernandez

Site Development Manager

Crown Castle NG East Inc.



CROWN CASTLE SFL60_3

CLIENT :

CLIENT SITE ID#:

ADDRESS: 550 SE 21ST STREET
FORT LAUDERDALE, FL 33316

SITE TYPE: **NEW WOOD POLE**

PROPERTY INFORMATION

SITE COORDINATES: 26.0955°
-80.1368°
JURISDICTION: CITY OF FORT LAUDERDALE

PROPERTY OWNER: CROWN CASTLE
ADDRESS: 8555 NW 64TH STREET
MIAMI, FL 33166

PROJECT TEAM

PROJECT MANAGEMENT FIRM: CROWN CASTLE
ADDRESS: 8555 NW 64TH STREET
MIAMI, FL 33166

ENGINEERING FIRM: AW SOLUTIONS, INC.
ADDRESS: 300 CROWN OAK CENTRE DR.
LONGWOOD, FL 32750
CONTACT: SHANE HAFNER
PHONE: 407.260.0231 EXT. 120
FLORIDA COA#: 26983

DESIGN CRITERIA:

- FLORIDA BUILDING CODE 2010 AND ASCE 7-10. WIND LOAD PER ASCE 7-10.
 - ULTIMATE WIND SPEED: 170 MPH.
 - BUILDING RISK CATEGORY: II.
 - WIND EXPOSURE: C.
- DEAD LOAD:
 - EQUIPMENT WEIGHT PER MANUFACTURER DATA.
- SEISMIC LOAD DOES NOT GOVERN THIS DESIGN.

DRAWING INDEX

SHEET	SHEET DESCRIPTION	REV
T1	TITLE SHEET	2
C1	SITE PLAN	2
C1.1	SITE PLAN ENLARGEMENT	1
C2	ELEVATION	2
C3	DETAILS	1
C4	DETAILS	1
SP1	SPECIFICATIONS	0
SP2	SPECIFICATIONS	0

APPROVALS

PROJECT MANAGER: _____ DATE: _____
CARRIER: _____
UTILITY: _____



300 CROWN OAK CENTRE DRIVE
LONGWOOD, FL 32750
TEL: 407.260.0231
FAX: 407.260.0749
FL COA#: 26983

DRAWN BY: EW CHECKED BY: JD

REV	DATE	DESCRIPTION
2	08/19/13	NODE LOCATION CHANGE
1	05/08/13	REVISED PER COMMENTS
0	01/11/13	ISSUED FOR PERMIT

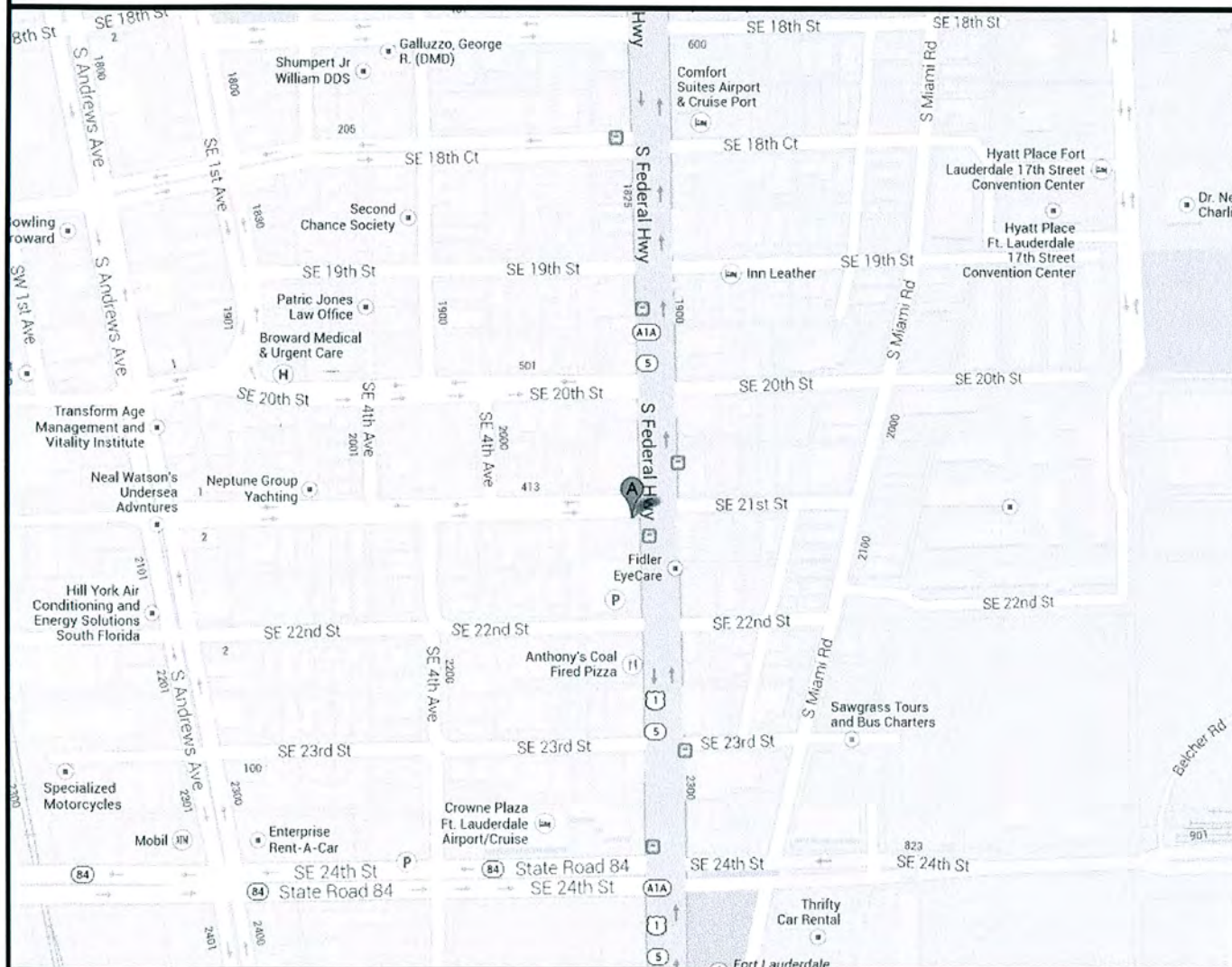


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SITE#: SFL60_3
ADDRESS: 550 SE 21ST STREET
FORT LAUDERDALE, FL 33316

SHEET TITLE:
TITLE SHEET

SHEET NUMBER:
T1
Exhibit 4



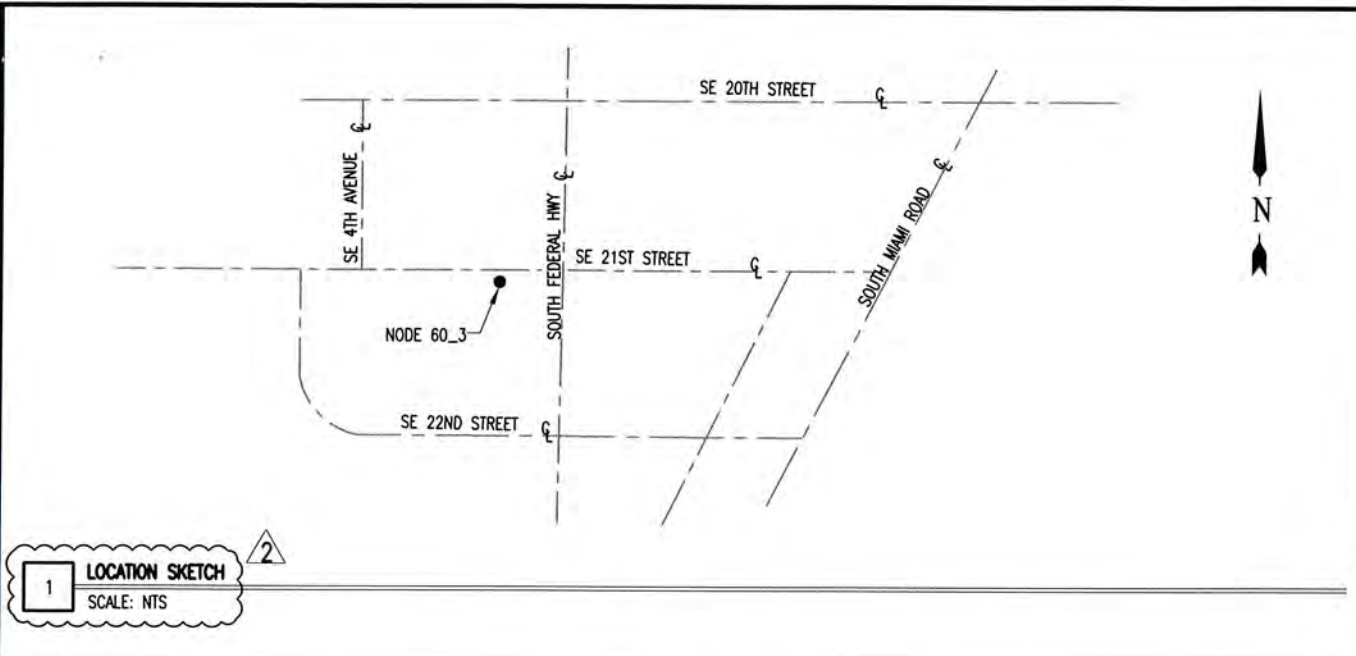
DRIVING DIRECTIONS **GENERAL VICINITY MAP**

FROM CROWN CASTLE OFFICE IN MIAMI, HEAD WEST ON NORTHWEST 64TH STREET. TURN RIGHT ONTO NORTHWEST 87TH AVENUE. TURN RIGHT ONTO NORTH WEST 74TH STREET, TURN LEFT TO MERGE ONTO FLORIDA-826 NORTH, TAKE THE US-441 SOUTH EXIT TOWARD I-95 NORTH, MERGE ONTO US-441 NORTH/FL-7 NORTH. KEEP LEFT AT THE FORK AND MERGE ONTO I-95 NORTH, TAKE EXIT 25 FOR FL-84 TOWARD MARINE MILE BOULEVARD. KEEP RIGHT AT THE FORK AND MERGE ONTO FL-84 EAST. TURN LEFT ONTO NORTH SR-A1A NORTH. TAKE THE 3RD LEFT ONTO SOUTHEAST 21ST STREET. DESTINATION WILL BE ON THE LEFT.

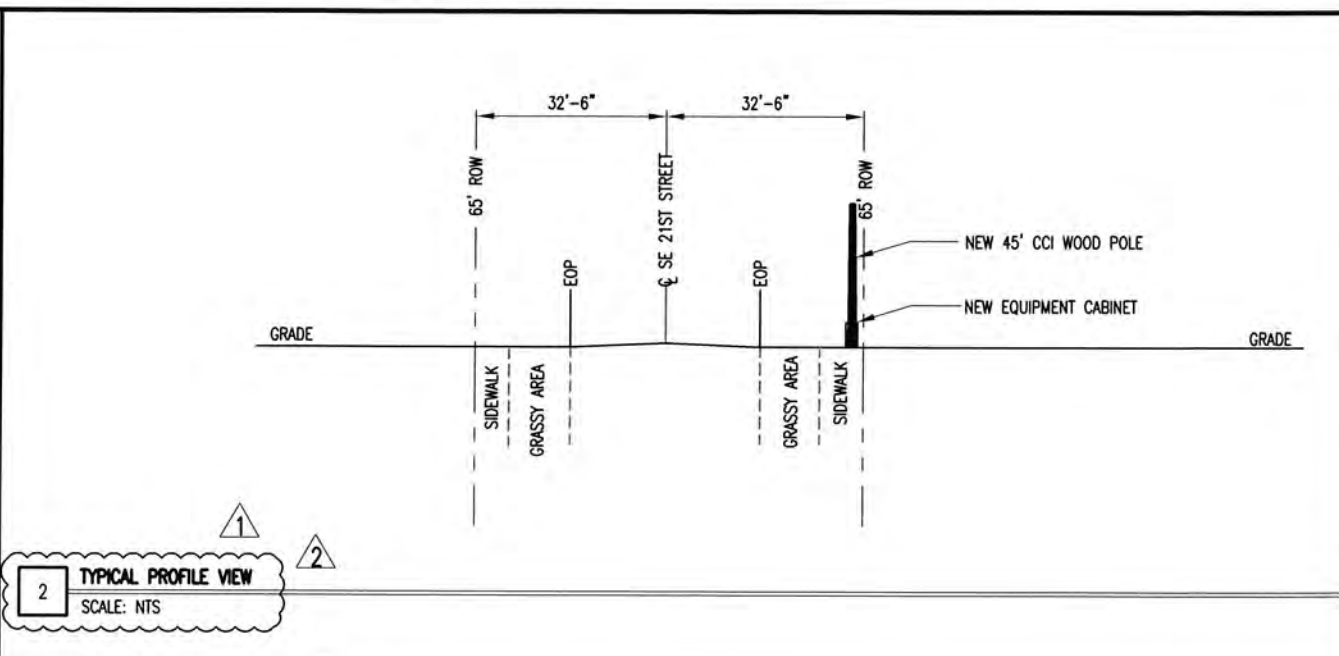


SPECIFIC LOCATION MAP

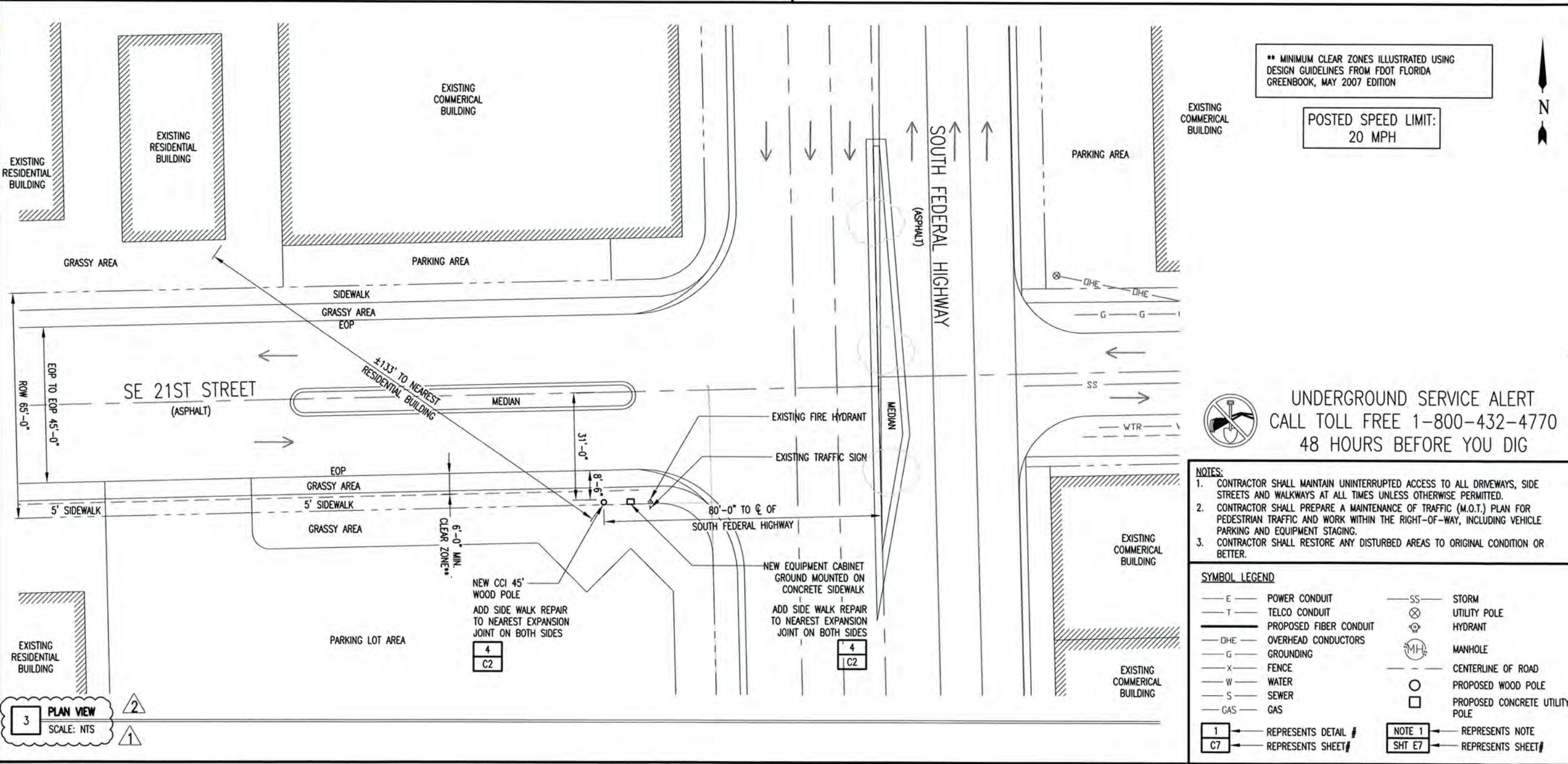
UNDERGROUND SERVICE ALERT
CALL TOLL FREE 1-800-432-4770
48 HOURS BEFORE YOU DIG



1 LOCATION SKETCH
SCALE: NTS



2 TYPICAL PROFILE VIEW
SCALE: NTS



3 PLAN VIEW
SCALE: NTS

** MINIMUM CLEAR ZONES ILLUSTRATED USING DESIGN GUIDELINES FROM FDOT FLORIDA GREENBOOK, MAY 2007 EDITION

POSTED SPEED LIMIT:
20 MPH



UNDERGROUND SERVICE ALERT
CALL TOLL FREE 1-800-432-4770
48 HOURS BEFORE YOU DIG

- NOTES:**
1. CONTRACTOR SHALL MAINTAIN UNINTERRUPTED ACCESS TO ALL DRIVEWAYS, SIDE STREETS AND WALKWAYS AT ALL TIMES UNLESS OTHERWISE PERMITTED.
 2. CONTRACTOR SHALL PREPARE A MAINTENANCE OF TRAFFIC (M.O.T.) PLAN FOR PEDESTRIAN TRAFFIC AND WORK WITHIN THE RIGHT-OF-WAY, INCLUDING VEHICLE PARKING AND EQUIPMENT STAGING.
 3. CONTRACTOR SHALL RESTORE ANY DISTURBED AREAS TO ORIGINAL CONDITION OR BETTER.

SYMBOL LEGEND

— E —	POWER CONDUIT	— SS —	STORM
— T —	TELCO CONDUIT	⊗	UTILITY POLE
— F —	PROPOSED FIBER CONDUIT	⊙	HYDRANT
— DHE —	OVERHEAD CONDUCTORS	⊕	MANHOLE
— G —	GROUNDING	— C —	CENTERLINE OF ROAD
— X —	FENCE	○	PROPOSED WOOD POLE
— W —	WATER	□	PROPOSED CONCRETE UTILITY POLE
— S —	SEWER		
— GAS —	GAS		

1 ← REPRESENTS DETAIL #
C7 ← REPRESENTS SHEET #

NOTE 1 ← REPRESENTS NOTE
SHT E7 ← REPRESENTS SHEET #



300 CROWN OAK CENTRE DRIVE
LONGWOOD, FL 32750
TEL: 407.260.0231
FAX: 407.260.0749
FL COA#: 26983

DRAWN BY: EW CHECKED BY: JD

REV	DATE	DESCRIPTION
2	08/19/13	NODE LOCATION CHANGE
1	05/08/13	REVISED PER COMMENTS
0	01/11/13	ISSUED FOR PERMIT



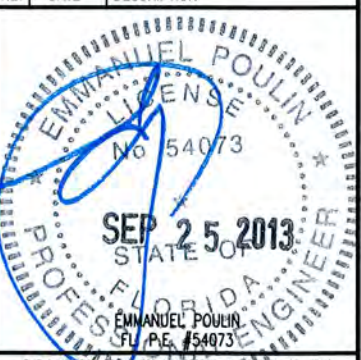
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SITE#: SFL60_3
ADDRESS: 550 SE 21ST STREET
FORT LAUDERDALE, FL 33316

SHEET TITLE:
SITE PLAN

SHEET NUMBER:
C1

REV	DATE	DESCRIPTION
1	05/08/13	SHEET ADDED
0	01/11/13	ISSUED FOR PERMIT



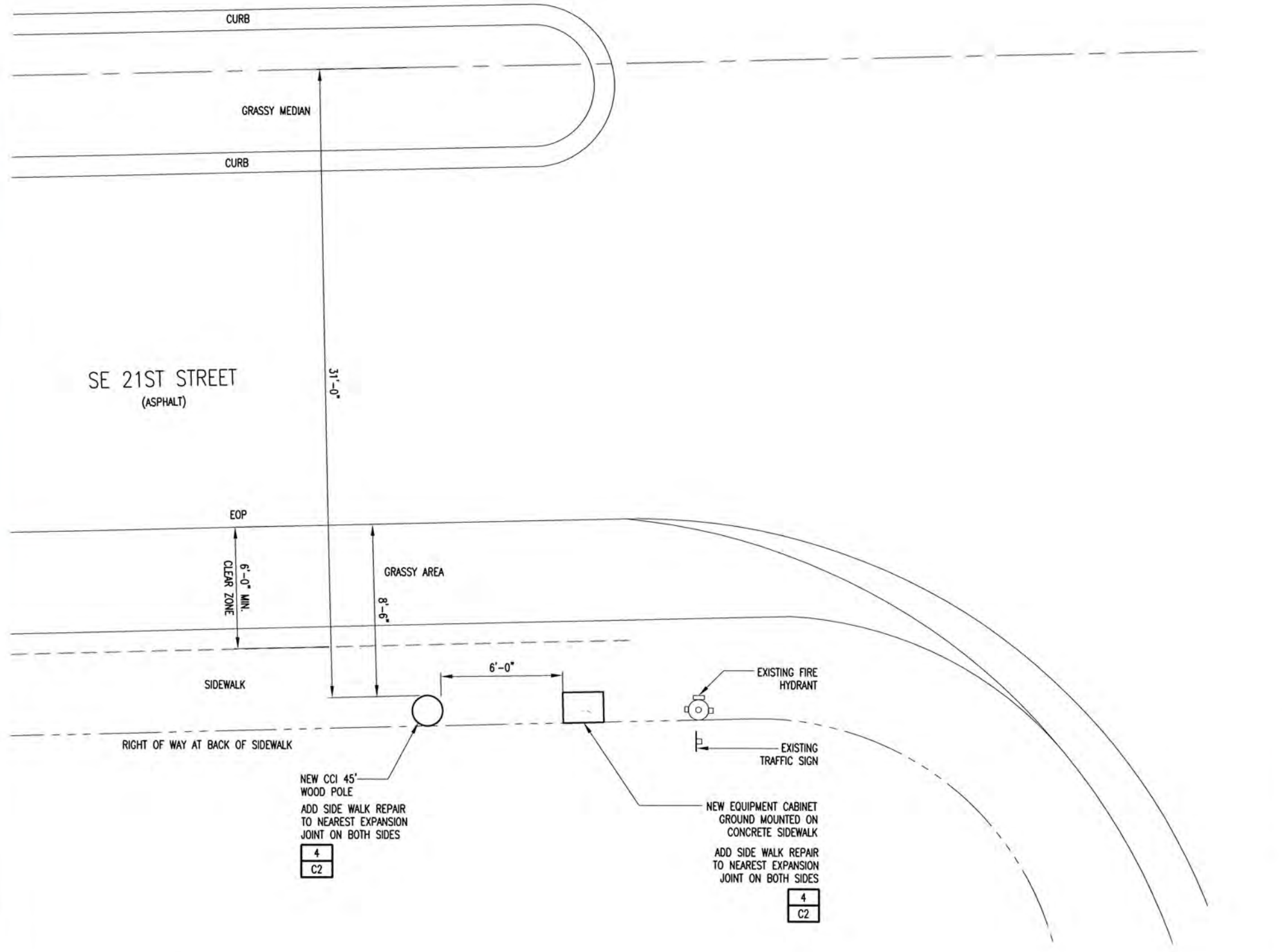
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SITE#: SFL60_3

ADDRESS: 550 SE 21ST STREET
FORT LAUDERDALE, FL 33316

SHEET TITLE:
SITE PLAN ENLARGEMENT

SHEET NUMBER:
C1.1



UNDERGROUND SERVICE ALERT
CALL TOLL FREE 1-800-432-4770
48 HOURS BEFORE YOU DIG

- NOTES:**
- CONTRACTOR SHALL MAINTAIN UNINTERRUPTED ACCESS TO ALL DRIVEWAYS, SIDE STREETS AND WALKWAYS AT ALL TIMES UNLESS OTHERWISE PERMITTED.
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 - CONTRACTOR SHALL RESTORE ANY DISTURBED AREAS TO ORIGINAL CONDITION OR BETTER.

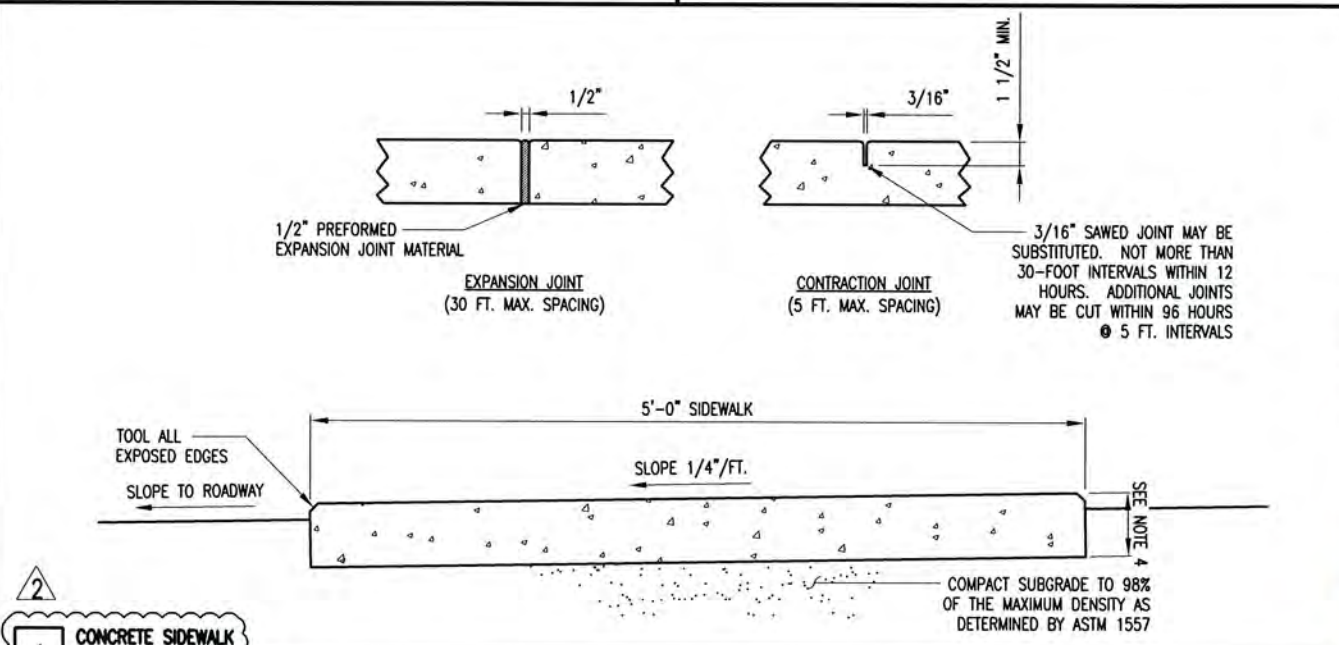
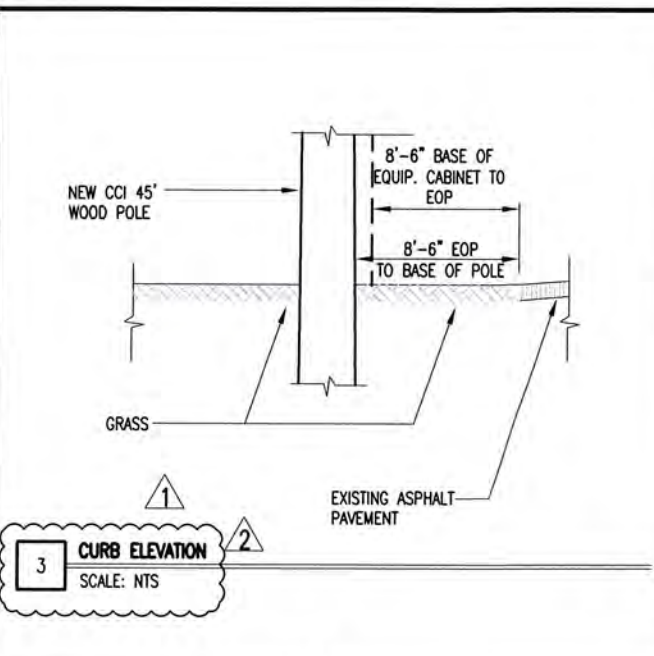
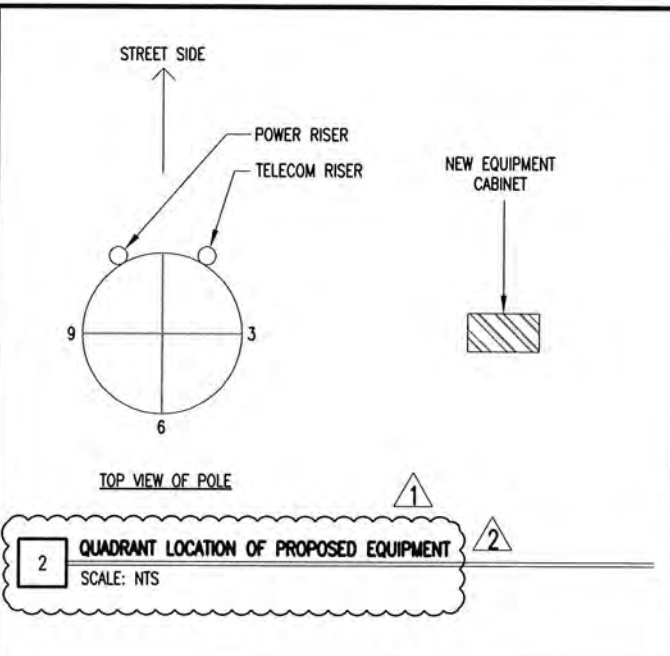
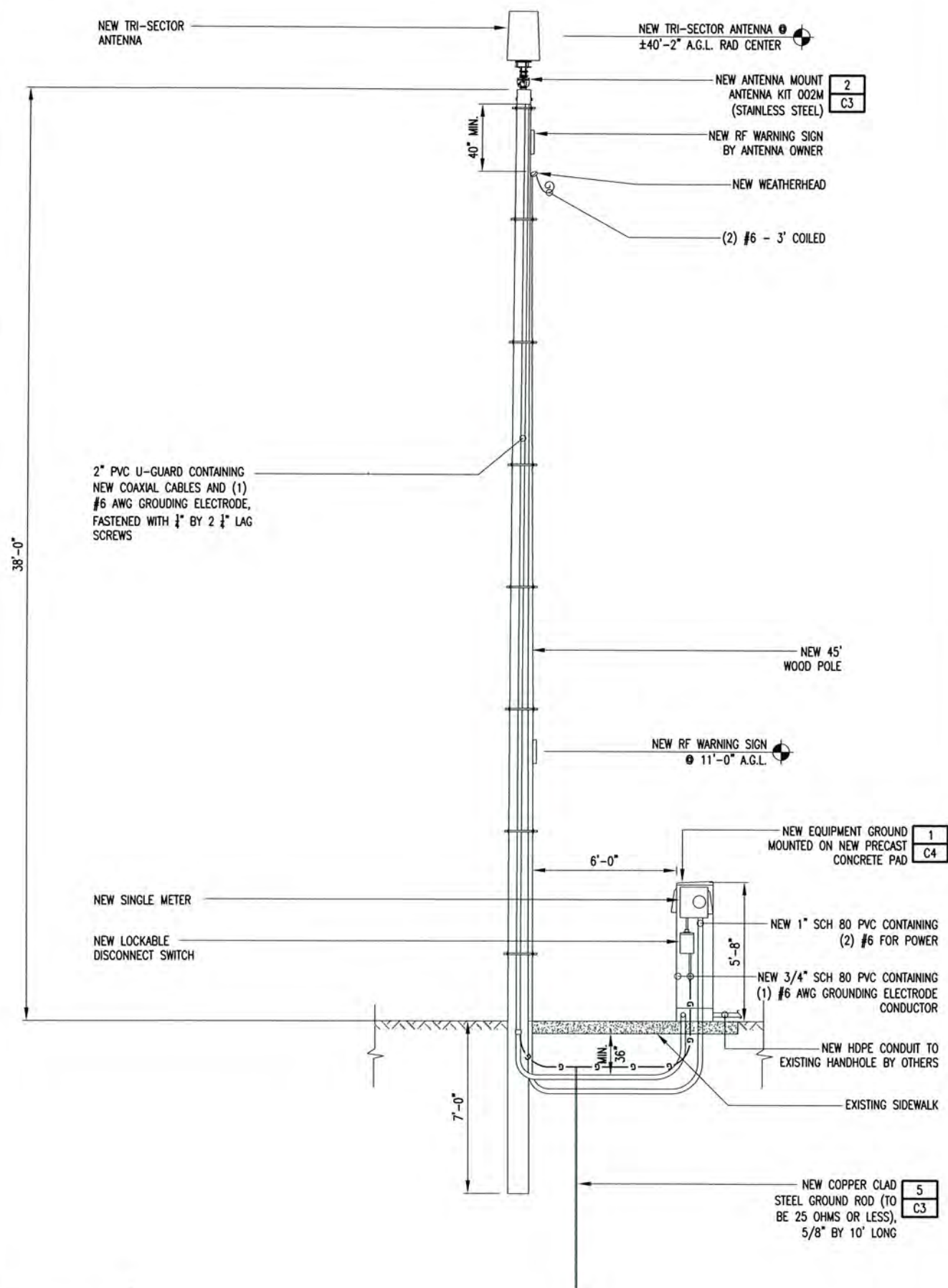
SYMBOL LEGEND

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— T — TELCO CONDUIT	⊗ UTILITY POLE
— F — PROPOSED FIBER CONDUIT	⊙ HYDRANT
— OHE — OVERHEAD CONDUCTORS	⊙ (M) MANHOLE
— G — GROUNDING	— C — CENTERLINE OF ROAD
— X — FENCE	○ PROPOSED WOOD POLE
— W — WATER	□ PROPOSED CONCRETE UTILITY POLE
— S — SEWER	
— GAS — GAS	

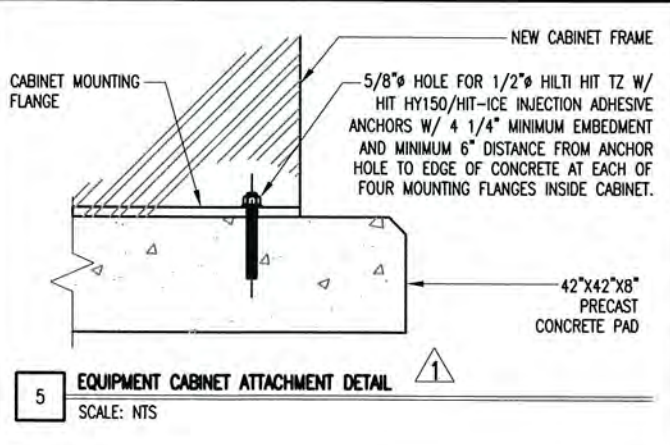
1 — REPRESENTS DETAIL #
C7 — REPRESENTS SHEET #

NOTE 1 — REPRESENTS NOTE
SHT E7 — REPRESENTS SHEET #

3 SITE PLAN ENLARGEMENT
SCALE: NTS



1. PROVIDE EXPANSION JOINTS BETWEEN SIDEWALK AND CURB OR AT ANY OTHER RIGID STRUCTURE.
2. EXPANSION JOINTS SHALL BE PROVIDED AT 30 FT. MAXIMUM SPACING.
3. ULTIMATE COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 2,500 P.S.I. @ 28 DAYS FOR SIDEWALKS
4. MINIMUM THICKNESS OF SIDEWALK SHALL BE 4 INCHES. CONCRETE DRIVEWAYS SHALL BE 6 INCHES THICK MINIMUM AND SHALL BE REINFORCED WITH 6X6 W1.4 X W1.4 WELDED WIRE MESH, PLACED 3 INCHES CLEAR FROM BOTTOM.
5. FOR SIDEWALKS OR DRIVEWAYS WITH R.O.W., COMPACT SUBGRADE TO 98% OF MAXIMUM DENSITY AS DETERMINED BY ASTM1557. COMPACTION OUTSIDE R.O.W. MAY BE 95% OF MAXIMUM DENSITY.



SYMBOL LEGEND

—E— POWER CONDUIT	—x— FENCE
—T— TELCO CONDUIT	—(S)— SILT FENCE
—OHE— OVERHEAD CONDUCTORS	
—G— GROUNDING	

1 REPRESENTS DETAIL #	NOTE 1 REPRESENTS NOTE
C7 REPRESENTS SHEET #	SHT E7 REPRESENTS SHEET #

1 ELEVATION
SCALE: NTS

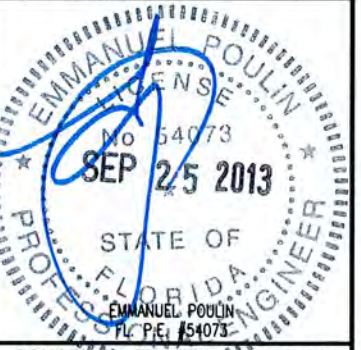


AW Solutions
INCORPORATED

300 CROWN OAK CENTRE DRIVE
LONGWOOD, FL 32750
TEL: 407.260.0231
FAX: 407.260.0749
FL COA# 26983

DRAWN BY: EW CHECKED BY: JD

REV	DATE	DESCRIPTION
2	08/19/13	NODE LOCATION CHANGE
1	05/08/13	REVISED PER COMMENTS
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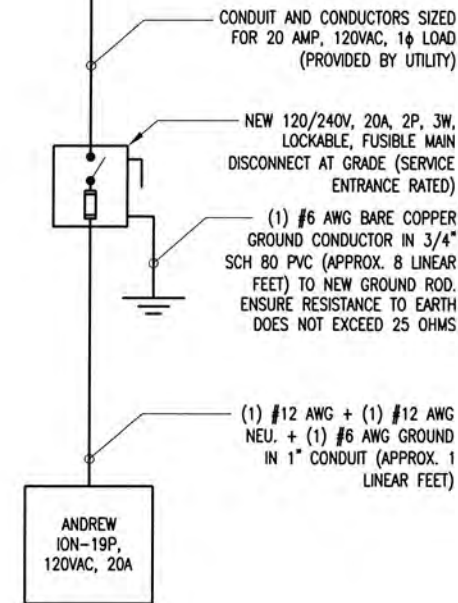
SITE#: SFL60_3

ADDRESS: 550 SE 21ST STREET
FORT LAUDERDALE, FL 33316

SHEET TITLE:
ELEVATION

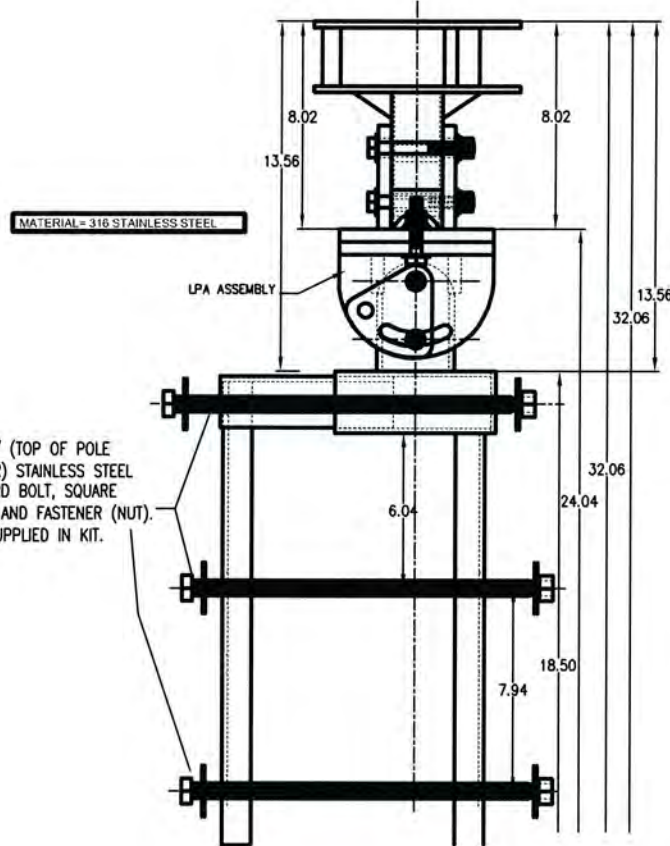
SHEET NUMBER:
C2

NEW ELECT. SERVICE,
20 AMP, 120VAC, 1φ



1 RISER DIAGRAM
SCALE: NTS

1. SHORT CIRCUIT CURRENT RATING OF FUSIBLE MAIN DISCONNECT: 100KA.
2. PER FLORIDA BUILDING CODE 2010: FEEDER CONDUCTORS ARE SIZED FOR A MAXIMUM VOLTAGE DROP OF 2% AT DESIGN LOAD OF 20A.
3. PER FLORIDA BUILDING CODE 2010: BRANCH CIRCUIT CONDUCTORS ARE SIZED FOR A MAXIMUM VOLTAGE DROP OF 3% AT DESIGN LOAD. HOWEVER, THIS DESIGN CONTAINS NO BRANCH CIRCUITS.
4. ALL CONDUCTORS ARE TO BE COPPER WIRE WITH INSULATION TYPE XHHW.
5. ALL ABOVE GRADE CONDUIT IS TO BE UV RESISTANT SCHEDULE 80 PVC. ALL BELOW GRADE CONDUIT IS TO BE SCHEDULE 40 PVC.



2 ANTENNA MOUNTING KIT (002M)
SCALE: NTS

KATHREIN
SCALA DIVISION

Kathrein's dual band antennas are ready for 3G applications, covering all existing wireless bands as well as all spectrum under consideration for future systems, AMPS, PCS and 3G/UMTS.

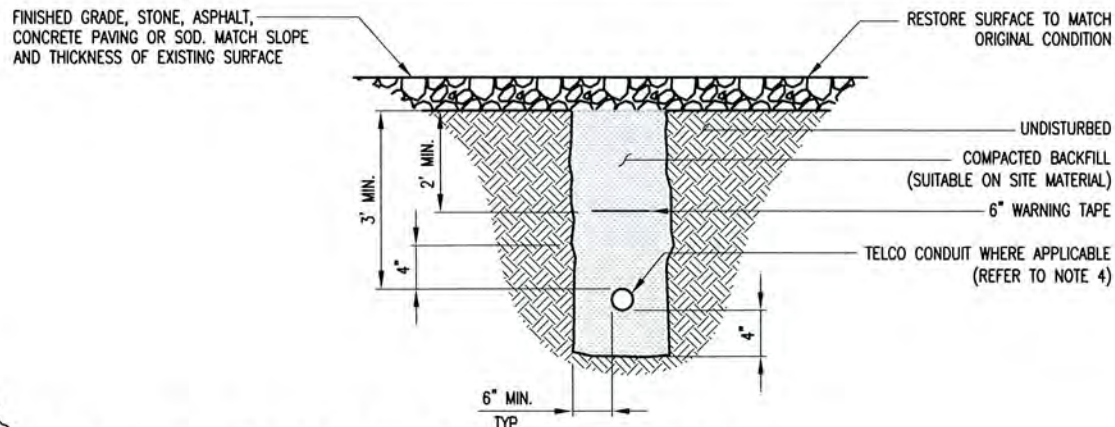
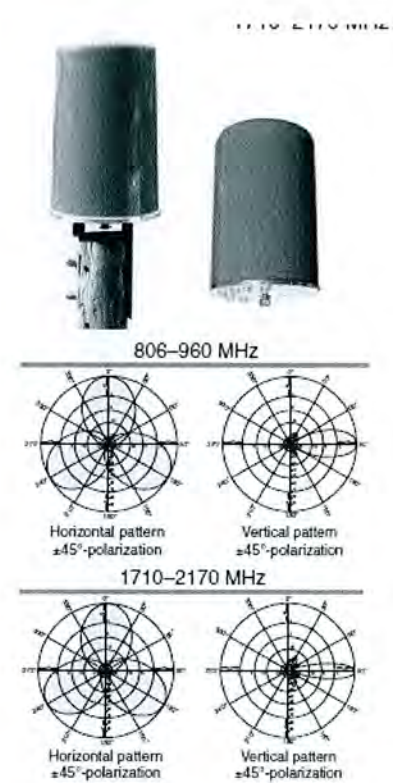
- Wide band operation.
- Exceptional intermodulation characteristics.
- High strength fiberglass radome.
- Internal duplexers allow the +45° polarization (upper and lower bands) to be combined on one connector and the -45° polarization (upper and lower bands) to be combined on a second connector for each antenna.

General specifications:

Frequency range	806-960 MHz 1710-2170 MHz
VSWR	<1.5:1
Impedance	50 ohms
Intermodulation (2x20w)	IM3: <-150 dBc
Polarization	+45° upper and lower band -45° upper and lower band
Connector	6 x 7-16 DIN female
Isolation intrasystem	>30 dB
Isolation intersystem	>40 dB (806-960 // 1710-2170 MHz)
Radome color	Brown, gray or dark gray (custom colors available at additional cost)
Weight	50 lb (22.7 kg)
Height	24 inches (609 mm)
Radome diameter	16 inches (407 mm)
Equivalent flat plate area	1.6 ft² (0.148 m²)
Wind survival rating*	100 mph (160 kph)
Shipping dimensions	32 x 20 x 19 inches (813 x 508 x 483 mm)
Shipping weight	52 lb (23.6 kg)
Mounting	Designed to be mounted on top of a utility pole using a custom mounting bracket supplied by the customer.

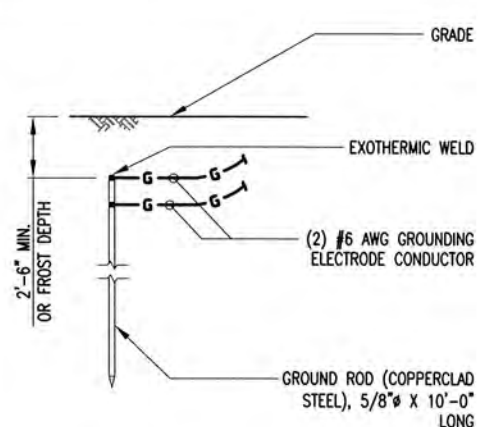
Specifications:	806-866 MHz	824-894 MHz	880-960 MHz	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Gain	11.1 dBi	11.4 dBi	11.8 dBi	12.5 dBi	13.3 dBi	13.6 dBi
Front-to-back ratio (180° ± 30°)	>23 dB (co-polar) >20 dB (total power)	>23 dB (co-polar) >20 dB (total power)	>25 dB (co-polar) >22 dB (total power)	>25 dB (co-polar) >22 dB (total power)	>25 dB (co-polar) >22 dB (total power)	>25 dB (co-polar) >22 dB (total power)
Maximum input power	250 watts (at 50°C)	250 watts (at 50°C)	250 watts (at 50°C)	200 watts (at 50°C)	200 watts (at 50°C)	200 watts (at 50°C)
+45° and -45° polarization horizontal beamwidth	67° (half-power)	66° (half-power)	64° (half-power)	66° (half-power)	60° (half-power)	60° (half-power)
+45° and -45° polarization vertical beamwidth	34° (half-power)	33° (half-power)	30° (half-power)	20° (half-power)	18° (half-power)	17.5° (half-power)
Cross polar ratio						
Main direction	0°	25 dB (typical)	25 dB (typical)	16 dB (typical)	18 dB (typical)	20 dB (typical)
Sector	±60°	>10 dB	>10 dB	>10 dB	>10 dB	>10 dB

3 ANTENNA SPECIFICATIONS
SCALE: NTS



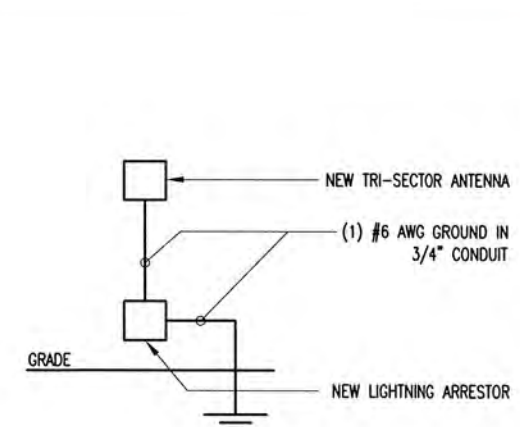
4 NEW UNDERGROUND CONDUIT(S) TRENCHING DETAIL (IF APPLICABLE, REFER TO SITE PLAN)
SCALE: NTS

1. PROVIDE SCHEDULE 40 PVC CONDUIT BELOW GRADE EXCEPT AS NOTED BELOW.
2. PROVIDE SCHEDULE 80 PVC CONDUIT AND ELBOWS AT STUB UP LOCATIONS (i.e. SERVICE POLE, BTS EQUIPMENT, ETC.).
3. INSTALL UTILITY PULLBOXES PER NEC.
4. SEPARATION DIMENSION TO BE VERIFIED WITH LOCAL UTILITY CO. REQUIREMENTS.
5. CONDUIT/TUBING CONTAINING FIBER OPTIC CABLING TO BE FILLED WITH GEL TO PREVENT WATER PENETRATION, COMMONLY REFERRED TO AS "ICKY PICK."



5 GROUND ROD DETAIL
SCALE: NTS

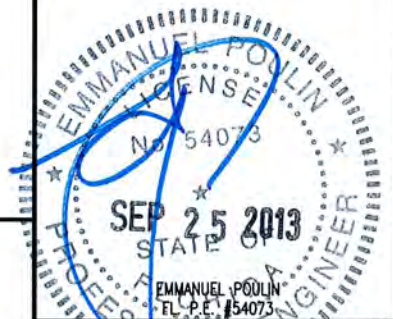
1. GROUND ROD TO BE DRIVEN 10' VERTICALLY.



6 ANTENNA GROUNDING SCHEMATIC
SCALE: NTS



DRAWN BY:	EW	CHECKED BY:	JD
REV	DATE	DESCRIPTION	
1	05/08/13	REVISED PER COMMENTS	
0	01/11/13	ISSUED FOR PERMIT	



IT IS A CONDITION OF ANY CONTRACT OR AGREEMENT WHEREBY ANY PERSON WHOSE NAME IS LISTED HEREIN IS ACTING UNDER THE AUTHORITY OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT WITHOUT THE WRITTEN PERMISSION OF AW SOLUTIONS INC. AW SOLUTIONS INC. ACCEPTS NO LIABILITY ASSOCIATED WITH THE REUSE, ALTERATION OR MODIFICATION OF THE CONTENTS HEREIN.

SITE#: SFL60_3
ADDRESS: 550 SE 21ST STREET
FORT LAUDERDALE, FL 33316

SHEET TITLE: DETAILS
SHEET NUMBER: C3

C3

REV	DATE	DESCRIPTION
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0	01/11/13	ISSUED FOR PERMIT



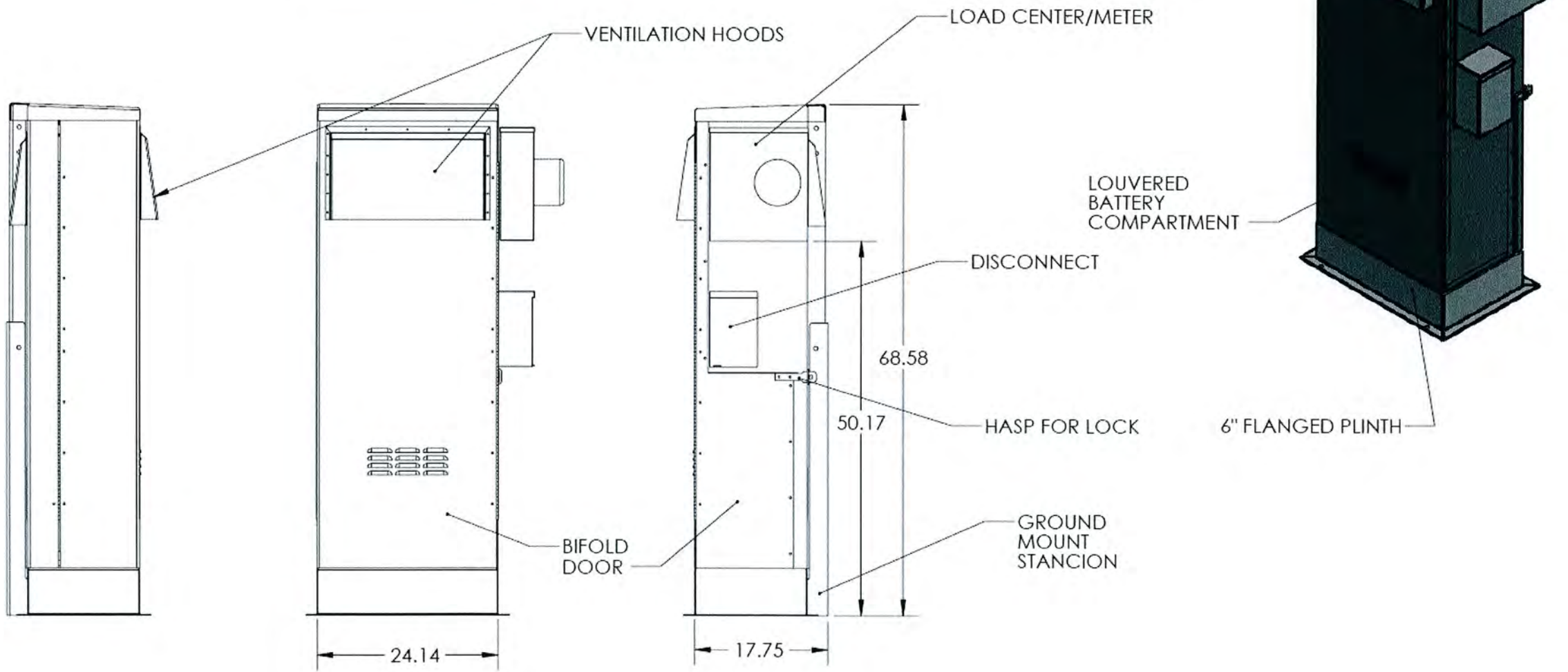
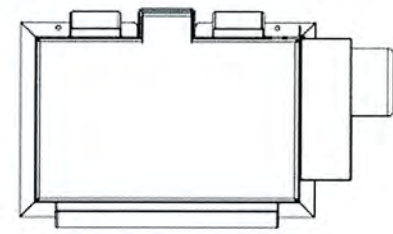
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ADDRESS: 550 SE 21ST STREET
FORT LAUDERDALE, FL 33316

SHEET TITLE:
DETAILS

SHEET NUMBER:
C4



1 SHROUD KIT LOSH-BBU-1 GROUND MOUNT
SCALE: NTS

1 - GENERAL PROVISIONS

1.1 - CONTRACT OVERVIEW

- 1. THE INTENTION OF THE DOCUMENTS IS TO SHOW THE COMPLETE INSTALLATION AND TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY, WHETHER OR NOT SPECIFICALLY INDICATED, FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT...

- 4. HAVING THE SUPPORT BELOW NOTED FOR DEMOLITION. ANY DAMAGE DUE TO DEMOLITION, OR OTHER CONSTRUCTION ACTIVITIES, DONE TO ANY EXISTING SURFACE TO REMAIN SHALL BE REPAIRED TO MATCH EXISTING AT NO ADDITIONAL COST TO THE OWNER.

- 1. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE AWAY FROM BUILDING OR EQUIPMENT ON THE SITE AT ALL TIMES. Silt and erosion control shall be maintained on the downstream side of the site at all times...

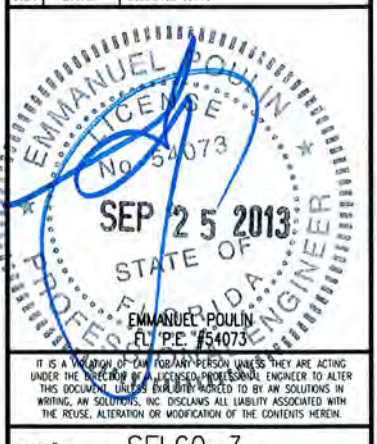
- 1. THE CONTRACTOR SHALL SEED THE GRADED AREAS PER DOT STANDARDS. AN SI GEOSOLUTIONS LAND LOCK CS2 EROSION CONTROL BLANKET SHALL BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.



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0 01/11/13 ISSUED FOR PERMIT



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SHEET TITLE: SPECIFICATIONS
SHEET NUMBER: SP1
Exhibit 4

11 - ELECTRICAL

11.1 GENERAL

1. THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, TRANSPORTATION, CONSTRUCTION TOOLS, ETC., FOR THE INSTALLATION OF COMPLETE AND PROPERLY OPERATING SYSTEMS.

2. INSTALLATION SHALL COMPLY WITH ALL APPLICABLE LAWS AND ORDINANCES OF ALL AUTHORITIES HAVING JURISDICTION AND WITH ALL ASSOCIATED UTILITY COMPANY REGULATIONS AND APPLICABLE REQUIREMENTS. INSTALLATION WILL ALSO COMPLY WITH THE LATEST EDITIONS OF ALL CODES AND STANDARDS OF THE ENTITIES LISTED ON SHEET SP1, NOTE 2. THE MOST STRINGENT CODE WILL APPLY IN THE CASE OF DISCREPANCIES OR DIFFERENCES IN THE CODE REQUIREMENTS.

3. THE CONTRACTOR SHALL SECURE ALL NECESSARY ELECTRICAL PERMITS AND PAY ALL REQUIRED FEES.

4. RECORD DRAWINGS: MAINTAIN A RECORD OF ALL CHANGES, SUBSTITUTIONS BETWEEN WORK AS SPECIFIED AND INSTALLED. RECORD CHANGES ON A CLEAN SET OF CONTRACT DOCUMENTS WHICH SHALL BE TURNED OVER TO THE CONSTRUCTION MANAGER UPON COMPLETION OF THE PROJECT.

5. ALL BROCHURES, OPERATION MANUALS, CATALOGS, SHOP DRAWINGS, SPECIFICATIONS, ETC., SHALL BE TURNED OVER TO THE CARRIER AT THE COMPLETION OF THE PROJECT.

6. GUARANTEE/WARRANTY: GUARANTEE INSTALLATION TO BE FREE OF DEFECTS, SHORTS, GROUND, ETC., FOR A PERIOD OF ONE YEAR. FURNISH WARRANTY SO THE DEFECTIVE MATERIAL AND/OR WORKMANSHIP WILL BE REPAIRED/REPLACED IMMEDIATELY UPON NOTIFICATION AT NO COST TO THE OWNER FOR PERIOD OF WARRANTY. IF, AFTER THIRTY (30) DAYS THE CORRECTIONS ARE NOT COMPLETE, THE OWNER RESERVES THE OPTION OF ARRANGING FOR THE NECESSARY REPAIRS AND BACKCHARGING THE CONTRACTOR FOR THE WORK.

7. THE CONTRACTOR SHALL COORDINATE WITH OTHER TRADES, AS NECESSARY.

8. DO NOT INTERRUPT EXISTING SERVICES WITHOUT WRITTEN PERMISSION OF THE OWNER OF THAT SERVICE AND WRITTEN PERMISSION OF THIS INSTALLATION'S CARRIER.

9. CHANGES: NO ADDITIONAL COSTS FOR LABOR OR MATERIALS WILL BE ALLOWED FOR CHANGES OR MODIFICATIONS MADE UNLESS PRIOR WRITTEN APPROVAL IS OBTAINED FROM THE ARCHITECT, ENGINEER OR OWNER IN THE FORM OF A CHANGE ORDER.

10. DRAWINGS: ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE NOT TO BE SCALED.

11. DISCREPANCIES: DISCREPANCIES ON THESE PLANS, SPECIFICATIONS, ETC., MUST BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.

12. SURVEY AND CONDITIONS: VISIT THE JOB SITE PRIOR TO SUBMITTING BID, AND MAKE A SURVEY OF EXISTING CONDITIONS WHICH MAY AFFECT THE WORK TO BE PERFORMED. NO OTHER ALLOWANCES WILL BE GIVEN FOR THE SITE CONDITION.

13. CO-OPERATION: CO-OPERATE WITH OTHER CONTRACTORS AND SUBCONTRACTORS ON SITE. ARRANGE AND EXECUTE WORK IN SUCH A MANNER AS REQUIRED FOR THE SATISFACTORY AND EFFICIENT CONSTRUCTION OF THIS PROJECT BY ALL TRADES CONCERNED.

14. TEMPORARY POWER: ARRANGE AND PAY FOR THE CARRIER'S TEMPORARY POWER DURING CONSTRUCTION.

15. INSTALLATION SHALL COMPLY SPECIFICALLY WITH ENGINEERING STANDARDS MANUAL. ANY DEVIATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT MANAGER PRIOR TO COMMENCEMENT OF WORK.

16. PROCUREMENT VERIFICATION: PROVIDE AN ITEMIZED CERTIFICATION TO THE PROJECT MANAGER THAT EQUIPMENT AND RELATED HARDWARE HAVE BEEN ORDERED WITHIN 24 HOURS OF NOTICE TO PROCEED.

17. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.

11.2 INSPECTIONS

1. GENERAL: DURING AND UPON COMPLETION OF WORK, ARRANGE AND PAY ALL ASSOCIATED INSPECTIONS OF ALL ELECTRICAL WORK INSTALLED UNDER THIS CONTRACT IN ACCORDANCE WITH THE CONDITIONS OF THE CONTRACT.

2. INSPECTIONS REQUIRED: AS PER THE LAWS AND REGULATIONS OF THE LOCAL AND/OR STATE AGENCIES HAVING JURISDICTION AT THE PROJECT SITE.

3. INSPECTION AGENCY: APPROVED BY THE LOCAL AND/OR STATE AGENCIES HAVING JURISDICTION AT THE PROJECT SITE.

4. CERTIFICATES: SUBMIT ALL REQUIRED INSPECTION CERTIFICATES TO THE CARRIER AND UTILITY.

11.3 HANGERS AND SUPPORTS

1. MATERIALS: ALL HANGERS, SUPPORTS, FASTENERS AND HARDWARE SHALL BE ZINC COATED OR OF EQUIVALENT CORROSION RESISTANCE BY TREATMENT OR INHERENT PROPERTY AND SHALL BE MANUFACTURED PRODUCTS DESIGNED FOR THE APPLICATION. PRODUCTS FOR OUTDOOR USE SHALL BE HOT DIP GALVANIZED.

2. TYPES: HANGERS, STRAPS, RISER SUPPORTS, CLAMPS, U-CHANNEL, THREADED RODS, ETC., AS INDICATED OR REQUIRED.

3. INSTALLATION: RIGIDLY SUPPORT AND SECURE ALL MATERIAL, RACEWAY AND EQUIPMENT TO BUILDING STRUCTURE USING HANGERS, SUPPORTS AND FASTENERS SUITABLE FOR THE USE ON MATERIALS AND LOADS ENCOUNTERED. PROVIDE ALL NECESSARY HARDWARE. PROVIDE CONDUIT SUPPORTS AT MAXIMUM 5 FT. O.C.

4. STRUCTURAL MEMBERS: DO NOT CUT, DRILL OR WELD ANY STRUCTURAL MEMBER EXCEPT AS SPECIFICALLY APPROVED BY THE ENGINEER.

5. MISCELLANEOUS SUPPORTS: PROVIDE ANY ADDITIONAL STRUCTURAL SUPPORT STEEL BRACKETS, ANGLES, FASTENERS AND HARDWARE AS REQUIRED TO ADEQUATELY SUPPORT ALL ELECTRICAL MATERIALS AND EQUIPMENT.

6. ONE-HOLE STRAPS SHALL NOT BE USED FOR CONDUITS LARGER THAN 3/4 INCH.

11.4 ENCLOSURES / RACEWAYS

1. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND BE RATED NEMA 1 (OR BETTER) INDOORS OR NEMA 3R (OR BETTER) OUTDOORS.

2. WIRERAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.

3. JUNCTION BOXES: JUNCTION BOXES SHALL BE A MINIMUM SIZE OF 4 INCHES SQUARE BY 1-1/4 INCHES DEEP.

11.5 HOLES, SLEEVES AND OPENINGS

1. GENERAL: PROVIDE ALL HOLES, SLEEVES AND OPENINGS REQUIRED FOR THE COMPLETION OF WORK AND RESTORE ALL DAMAGED SURFACES TO MATCH SURROUNDING SURFACES.

2. CONDUIT PENETRATIONS: SIZE CORE-DRILLED HOLES SO THAT AN ANNUAL SPACE OF NOT LESS THAN 1/4 INCH AND NOT MORE THAN 1 INCH IS LEFT AROUND THE CONDUIT, PIPE, ETC. WHEN OPENINGS ARE CUT IN LIEU OF CORE-DRILLED, PROVIDE SLEEVE IN ROUGH OPENING. SIZE SLEEVES TO PROVIDE AN ANNUAL SPACE OF NOT LESS THAN 1/4 INCH AND NOT MORE THAN 1 INCH AROUND THE CONDUIT, PIPE, ETC. PATCH AROUND SLEEVE TO MATCH SURROUNDING SURFACE.

3. PROVIDE APPROPRIATE WEATHERPROOFING MATERIALS FOR PENETRATIONS REQUIRING TO BE SEALED FROM POTENTIAL WATER INTRUSION. PROVIDE FIREPROOF MATERIALS FOR PENETRATIONS REQUIRING A FIRE RATED SEAL. REFER TO CUTTING AND PATCHING NOTES UNDER SECTION 1 - GENERAL.

4. IF ANY ROOFTOP WORK IS TO BE PERFORMED, THE CONTRACTOR SHALL USE THE BUILDING OWNER'S APPROVED ROOFING CONTRACTOR TO PREVENT VOIDING ANY EXISTING ROOFING WARRANTIES. ANY DAMAGE TO THE EXISTING ROOFING MEMBRANE SHALL BE REPAIRED IMMEDIATELY TO AVOID MOISTURE INTRUSION INTO THE BUILDING SHELL.

5. GENERAL: PROVIDE ALL CUTTING, DRILLING, FITTING AND PATCHING NECESSARY FOR ACCOMPLISHING THE WORK. THIS INCLUDES REMOVAL AND REPLACEMENT OF DEFECTIVE WORK AND WORK NOT CONFORMING TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

6. REPAIRS: REPAIR ANY AND ALL DAMAGE TO WORK OF OTHER TRADES CAUSED BY CUTTING AND PATCHING OPERATIONS.

7. USING SKILLED MECHANICS OF THE TRADES INVOLVED.

DO NOT CUT MAJOR STRUCTURAL ELEMENTS WITHOUT APPROVAL. PATCHING SHALL BE OF QUALITY EQUAL TO AND OF MATCHING APPEARANCE OF EXISTING CONSTRUCTION.

11.6 CONDUCTORS

1. USE 98% CONDUCTIVITY COPPER WITH TYPE XHHW-2 INSULATION, 600 VOLT, COLOR CODED. USE SOLID CONDUCTORS FOR WIRE UP TO AND INCLUDING NO. 8 AWG. STRANDED CONDUCTORS FOR WIRE LARGER THAN NO. 8 AWG. USE PRESSURE-TYPE INSULATED TWIST-ON CONNECTORS FOR NO. 10 AWG AND SMALLER, SOLDERLESS MECHANICAL TERMINAL LUGS FOR NO. 8 AWG AND LARGER. ALUMINUM CONDUCTORS SHALL NOT BE USED.

2. NO BX, MC OR ROMEX CABLE SHALL BE PERMITTED.

3. EACH END OF EVERY POWER, GROUNDING AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA AND MATCH EXISTING INSTALLATION REQUIREMENTS. ALL THE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL. REMOVE SHARP EDGES.

4. ALL CONDUIT SIZES SPECIFIED IN THIS DOCUMENT WERE DONE SO TAKING INTO ACCOUNT THE USE OF COPPER CONDUCTORS.

11.7 ELECTRICAL SERVICE

1. GENERAL: COMPLY WITH AND CO-ORDINATE ALL REQUIREMENTS OF THE UTILITY COMPANY.

2. SHORT CIRCUIT RATINGS: PROVIDE EQUIPMENT WITH HIGHER FAULT CURRENT RATINGS AS NEEDED TO MATCH UTILITY COMPANY AVAILABLE FAULT CURRENT.

3. CONTRACTOR TO VERIFY UTILITY CO. FAULT CURRENT AND ENSURE THAT ALL EQUIPMENT MEETS FAULT CURRENT (AT A MINIMUM ALL EQUIPMENT TO BE 10,000 AC).

4. THE CONTRACTOR IS RESPONSIBLE FOR MAKING ARRANGEMENTS WITH THE ELECTRIC UTILITY RELATIVE TO A TIMELY INSTALLATION OF THE NEW SERVICES AND PAYING ALL ASSOCIATED FEES.

5. IDENTIFICATION: IDENTIFY SERVICE DISCONNECTION MEANS WITH PERMANENT NAMEPLATE.

6. THE LOCATION SHOWN FOR A UTILITY POLE OR CONNECTION TO NEW UTILITIES IS FOR CONCEPTUAL USE ONLY. THE CONTRACTOR SHALL COORDINATE THE ACTUAL LOCATION WITH THE ELECTRIC UTILITY.

7. LOCATION AND ARRANGEMENTS: DRAWINGS INDICATE DIAGRAMMATICALLY THE DESIRED LOCATION OF EQUIPMENT, FIXTURES, OUTLETS, ETC., AND ARE NOT TO BE SCALED. PROPER JUDGMENT MUST BE EXERCISED IN THE EXECUTION TO ENSURE THE BEST POSSIBLE INSTALLATION.

8. PANEL AND DISTRIBUTION BOARD IDENTIFICATION: SWITCHBOARDS, PANELBOARDS, TRANSFORMERS AND DISTRIBUTION SECTIONS SHALL BE IDENTIFIED WITH ENGRAVED, WHITE ON BLACK, LAMINATED, RIGID PHENOLIC NAMEPLATES WITH 1/4 INCH CHARACTERS, SECURELY AFFIXED TO FACE OF CABINET.

11.8 TELEPHONE SERVICE

1. GENERAL: INSTALLATION SHALL BE IN ACCORDANCE WITH TELEPHONE UTILITY COMPANY'S RULES AND REGULATIONS.

2. THE CONTRACTOR IS RESPONSIBLE FOR MAKING ARRANGEMENTS WITH THE TELEPHONE UTILITY RELATIVE TO A TIMELY INSTALLATION OF THE INCOMING TELEPHONE SERVICES AND PAYING ALL ASSOCIATED FEES.

3. METALLIC CONDUIT OR TUBING FOR T1 LINES SHALL BE BONDED TO GROUND ON BOTH ENDS.

4. THE LOCATION SHOWN FOR A TELEPHONE POLE OR CONNECTION TO THE TELCO DEMARC IS FOR CONCEPTUAL USE ONLY. THE CONTRACTOR SHALL COORDINATE THE ACTUAL LOCATION WITH THE TELEPHONE UTILITY.

11.9 CHECKOUT, TESTING AND ADJUSTING

1. CORRECTION/REPLACEMENT: AFTER TESTING BY CONTRACTOR, OWNER OR ENGINEER, CORRECT ANY DEFICIENCIES AND REPLACE MATERIALS AND EQUIPMENT SHOWN TO BE DEFECTIVE OR UNABLE TO PERFORM AT DESIGN OR RATED CAPACITY.

2. POWER CONDUCTORS: CONTRACTOR SHALL CONDUCT A CONTINUITY AND INSULATION TEST ON CONDUCTORS BETWEEN SERVICE DISCONNECT SWITCH AND LOAD CENTER.

3. WHEN SITE POWER IS DERIVED FROM A 3-PHASE SOURCE, LOAD READINGS WILL BE TAKEN AND RECORDED TO MAINTAIN A BALANCED LOAD AT THE PRIMARY SOURCE. RECORDS SHALL BE RETURNED TO THE OWNER'S REPRESENTATIVE.

11.10 RACEWAY SYSTEMS / CONDUIT

1. UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC CONDUIT. UNDERGROUND PVC CONDUIT SHALL TRANSITION TO RIGID GALVANIZED STEEL CONDUIT OR SCHEDULE 80 PVC CONDUIT BEFORE RISING ABOVE GRADE OR CONCRETE SLAB. EXPOSED CONDUIT SHALL BE RIGID GALVANIZED STEEL (RGS) CONDUIT OR SCHEDULE 80 PVC CONDUIT.

2. RGS CONDUITS, WHEN SPECIFIED, SHALL MEET UL-6 FOR GALVANIZED STEEL. ALL FITTINGS SHALL BE SUITABLE FOR USE WITH THREADED RIGID CONDUIT.

3. ELECTRICAL METALLIC TUBING (EMT) OR RIGID, NONMETALLIC CONDUIT (RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

4. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (RIGID PVC SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.

5. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.

6. PLUG AND CAP EACH END OF SPARE AND EMPTY CONDUITS AND PROVIDE TWO SEPARATE PULL STRINGS - 200 LB. TEST POLYETHYLENE CORD.

7. ALL CONDUIT BENDS SHALL BE MINIMUM OF 24 INCH RADIUS.

8. ALL METALLIC RACEWAYS SHALL BE GROUNDED PER NEC.

9. THE CONTRACTOR SHALL FIELD VERIFY THE BEST AND LEAST DISRUPTIVE ROUTING OF CONDUITS, CABLE TRAYS AND DUCTS. CONDUIT ROUTING IS SHOWN AS A GUIDE ONLY, ACTUAL CONDUIT PLACEMENT IS TO BE DONE IN A PROFESSIONAL MANNER.

11.11 BELOW GRADE

1. THIS SITE INCLUDES NEW CRITICAL UNDERGROUND ELECTRIC, TELEPHONE AND OTHER SERVICES IN THE VICINITY OF OTHER UNDERGROUND SERVICES AND EQUIPMENT SUPPORTS. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID SERVICE DISRUPTION TO THESE FACILITIES. THE CONTRACTOR SHALL ALSO CONTACT ELECTRIC AND TELEPHONE, AND ALL OTHER APPROPRIATE AGENCIES PRIOR TO EXCAVATION AT THIS SITE.

2. PRIOR TO EXCAVATION, A UTILITY MARK OUT SHALL BE DONE TO LOCATE EXISTING UNDERGROUND UTILITIES. ALL UNDERGROUND UTILITIES MUST BE LOCATED AND MARKED OUT PRIOR TO ANY EXCAVATION WORK BEING PERFORMED. PHOTOS SHALL BE TAKEN OF ALL UNDERGROUND WORK AND GIVEN TO THE CARRIER DURING THE SITE'S HANDOFF.

3. ALL TRENCHING AND EXCAVATION WITHIN EXISTING COMPOUNDS MUST BE PERFORMED BY HAND IN ACCORDANCE WITH THE OWNER'S SPECIFICATIONS. ANY OTHER METHODS OF DIGGING MUST FIRST BE APPROVED BY THE CONSTRUCTION MANAGER.

4. ALL LOW VOLTAGE CONDUIT (600V OR LESS) SHALL HAVE A MINIMUM BURIAL DEPTH OF 24". ALL HIGH VOLTAGE CONDUIT (600V OR MORE) SHALL HAVE A MINIMUM BURIAL DEPTH OF 36".

5. UNDERGROUND CONDUIT SHALL BE ENCASED IN REINFORCED CONCRETE IN AREAS OF VEHICLE TRAFFIC. CONCRETE ENCASEMENT SHALL BE 3" MINIMUM ALL AROUND AND BETWEEN CONDUITS.

6. ALL BURIED CONDUIT SHALL BE IDENTIFIED WITH ELECTRICAL MARKER TAPE. TAPE SHALL BE PLACED 12" ABOVE CONDUIT FOR EASY IDENTIFICATION.

11.12 EQUIPMENT

1. THE MAIN CIRCUIT BREAKER SHALL BE RATED FOR STANDARD A.I.C. RATING HIGHER THAN INCOMING EQUIPMENT A.I.C.

2. ALL EQUIPMENT SHALL BE BRANDED FOR STANDARD A.I.C. RATING HIGHER THAN INCOMING FROM UTILITY CO.

3. THE CONTRACTOR SHALL PROVIDE AN ITEMIZED CERTIFICATION TO THE CARRIER OF ALL EQUIPMENT AND RELATED HARDWARE, SPECIFIED TO BE PURCHASED AND INSTALLED BY THE CONTRACTOR, WHERE ORDERED WITHIN 24 HRS OF THE NOTICE TO PROCEED.

4. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH ITS VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).

5. METAL RECEPTACLE SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 11; AND BE RATED NEMA 1 (OR BETTER) INDOORS OR WEATHER-PROTECTED (WP OR BETTER) OUTDOORS.

6. NONMETALLIC RECEPTACLE SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2, AND BE RATED NEMA 1 (OR BETTER) INDOORS OR WEATHER-PROTECTED (WP OR BETTER) OUTDOORS.

11.13 TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS)

1. TVSS DEVICES FOR AC POWER SHALL BE INSTALLED IN ALL EXISTING FACILITIES THAT ARE MISSING TVSS DEVICES OR HAVE UNSUITABLE TVSS DEVICES.

2. THE AC POWER COMMON MODE SURGE SUPPRESSOR SHALL BE CONNECTED TO THE COMMERCIAL POWER INPUT SIDE OF THE MANUAL TRANSFER SWITCH.

3. IN MARKETS WITH LIGHTNING ZONE > OR = TO 4, RF TVSS DEVICE SHALL BE INSTALLED AT THE ENTRANCE TO THE SHELTER OR AS CLOSE AS POSSIBLE TO THE BITS CABINET FOR OUTDOOR SITES, TO PROTECT AGAINST LIGHTNING AND TRANSIENT VOLTAGES.

4. A T1 TRANSPORT TVSS DEVICE SHALL BE INSTALLED AT ALL SITES BETWEEN THE NIU AND THE BITS.

13 - RF AND TOWER APPURTENANCE INSTALLATION RELATED NOTES

13.1 COAXIAL CABLE REQUIREMENTS:

1. GENERAL: PROVIDE ALL LABOR, EQUIPMENT, AND MATERIALS NECESSARY FOR RECEIVING, INSTALLING, TESTING, AND ADJUSTING ANTENNA CABLES FROM THE ANTENNA TO THE CONNECTIONS AT THE BASE TRANSMISSION SYSTEM (BTS). THIS SHALL INCLUDE ALL EQUIPMENT SHOWN OR REQUIRED FOR A COMPLETE OPERATING SYSTEM. ANTENNA ANTENNA CABLES, CONNECTORS, AND FITTING SHALL BE THIRD PARTY FURNISHED COMPONENTS AS SHOWN ON THE BILL OF MATERIALS.

2. CABLE HANGERS SHALL BE INSTALLED AT A MAXIMUM 4' SPACING.

3. INSTALLATION

A. COAXIAL CABLE LENGTHS SHALL BE FIELD MEASURED. INSTALLER SHALL NOTIFY CARRIER PRIOR TO PURCHASE OF CABLE OF THE OVERALL LENGTH REQUIRED.

B. COAXIAL CABLE TYPE AND DIAMETER SHALL BE VERIFIED WITH CARRIER.

C. COAXIAL CABLES SHALL BE LABELED IN ACCORDANCE WITH CARRIER ELECTRICAL MATERIALS AND METHODS SPECIFICATIONS. ALL MAIN CABLES WILL BE COLOR CODED AT FOUR LOCATIONS: A) AT ANTENNA PRIOR TO JUMPER; B) AT THE BOTTOM OF THE TOWER; C) EXTERIOR PART OF THE WAVE GUIDE ENTRY PORT (AT THE SHELTER/CABINET WALL); D) INTERIOR OF THE SHELTER/CABINET. PROVIDE AT LEAST 6" OF SLACK IN THE MAIN COAXIAL CABLES AT THE ANTENNA END TO PROVIDE FOR FUTURE CONNECTOR REPLACEMENT.

D. INSTALL CONNECTORS TO COAXIAL CABLE AT BOTH ENDS (ANTENNA END AND BITS LOCATION).

E. UPON SUCCESSFUL COMPLETION OF THE SWEEP TEST, THE CONTRACTOR SHALL PROVIDE A WEATHERTIGHT SEAL ON THE COAX CABLES.

F. THE MINIMUM BENDING RADIUS FOR ALL ANTENNA CABLES SHALL BE AS SHOWN BELOW OR PER THE MANUFACTURER, WHICHEVER IS MORE CONSERVATIVE:

CABLE	IN AIR OR CABLE TRAY	IN CONDUIT
1/2"	5"	10"
7/8"	10"	18"
1-5/8"	20"	28"

4. CABLES SHALL BE INSTALLED WITH THE MINIMUM NUMBER OF BENDS. CABLE SHALL NOT BE LEFT UNTERMINATED IN THE FIELD.

5. GROUNDING

A. ALL MAIN CABLES WILL BE GROUNDED AT: A) THE ANTENNA, B) MIDDLE OF THE CABLE RUN IF OVER 200', C) PRIOR TO ENTERING EQUIPMENT SHELTER/CABINET (WITHIN 1' OF ENTRY).

B. GROUNDING KITS - AFTER INSTALLATION OF GROUND STRAPS, THE CONNECTIONS SHALL BE MADE WEATHER TIGHT USING WEATHERPROOF KITS AS IDENTIFIED. GROUND PIGTAILS SHALL BE BROUGHT OUT IN THE DOWNWARD DIRECTION FROM THE CONNECTION TO THE ANTENNA CABLE WITHOUT ANY SHARP BENDS (MINIMUM RADIUS 10") AND CONNECTION SHALL BE MADE TO GROUNDING SYSTEM.

13.2 ANTENNA REQUIREMENTS:

1. AZIMUTHS ARE ORIENTED CLOCKWISE FROM TRUE NORTH.

2. CONTRACTOR SHALL VERIFY ANTENNA TYPE, AZIMUTHS, AND DOWNLITS WITH THE CARRIER PRIOR TO CONSTRUCTION.

3. THE MINIMUM DISH RAD CENTER HEIGHT ABOVE THE ROOF SHALL BE 6'-8".

13.3 TOWER CLIMBING SAFETY GUIDELINES

1. TOWER CLIMBERS MUST HAVE COMPLETED A NATE CERTIFIED CLIMBING TRAINING COURSE PER CONTRACT SPECIFICATIONS PRIOR TO WORK ON THIS STRUCTURE.

2. CONTRACTOR MUST COMPLY WITH THE STANDARD "RF POWER AND LOCKOUT/TAGOUT" PROCEDURES BEFORE ALLOWING CLIMBERS ON THIS STRUCTURE.

3. TOWER CLIMBERS WILL NOT BE ALLOWED TO ACCESS TOWER IN ADVERSE WEATHER CONDITIONS, INCLUDING HIGH WINDS, LIGHTNING, RAIN, SNOW ICE OR DURING NIGHT TIME.

4. CONTRACTOR OR CLIMBERS SHALL IMMEDIATELY REPORT ANY CLIMBING EQUIPMENT OR CONDITIONS JUDGED INADEQUATE OR UNSAFE.

5. EMERGENCY NUMBERS SHALL BE POSTED ON SITE AND ADVERTIZED TO CLIMBERS BEFORE THE BEGINNING OF THE WORK.

6. SAFETY MEETINGS SHALL TAKE PLACE EVERY MORNING BEFORE THE WORK DAY BEGINS.

20 - SITE SPECIFIC NOTES

20.1 GENERAL

1. CONSTRUCTION INCLUDES:

- INSTALLATION OF COMMUNICATION EQUIPMENT
- ANTENNAS AND MOUNT INSTALLATION ON STRUCTURE

2. THE PROFESSIONALS INVOLVED ON THIS PROJECT ARE AS FOLLOWS:

- AW SOLUTIONS, INC.
- ENGINEER: 300 CROWN OAK CENTRE DRIVE, LONGWOOD, FL 32750, PHONE 407.260.0231

LEGEND AND ABBREVIATIONS

AHJ AUTHORITY HAVING JURISDICTION

AWG AMERICAN WIRE GAUGE

BCW BARE COPPER WIRE

BTS BASE TRANSMISSION SYSTEM

CGRE COAX ISOLATED GROUND BAR, EXTERNAL

DA# DIAMETER

EMT ELECTRICAL METALLIC TUBING

GEN GENERATOR

GPS GLOBAL POSITIONING SYSTEM

MGB MASTER ISOLATED GROUND BAR

NEC NATIONAL ELECTRIC CODE, LATEST ADOPTED EDITION

PPC POWER PROTECTION CABINET

PVC POLY VINYL CHLORIDE

RGS RIGID GALVANIZED STEEL

TYP TYPICAL



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SHEET TITLE: SPECIFICATIONS

SHEET NUMBER: SP2

Exhibit 4