

SIEBEIN ACOUSTIC

ARCHITECTURAL | ENVIRONMENTAL

PROFESSIONAL QUALIFICATIONS

Proposal for
Soundscape Assessment and Design
in Response to

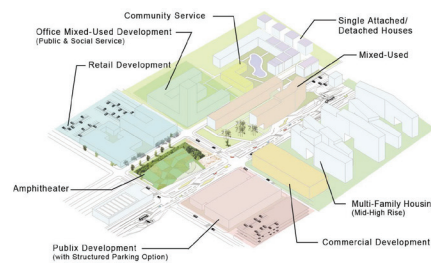
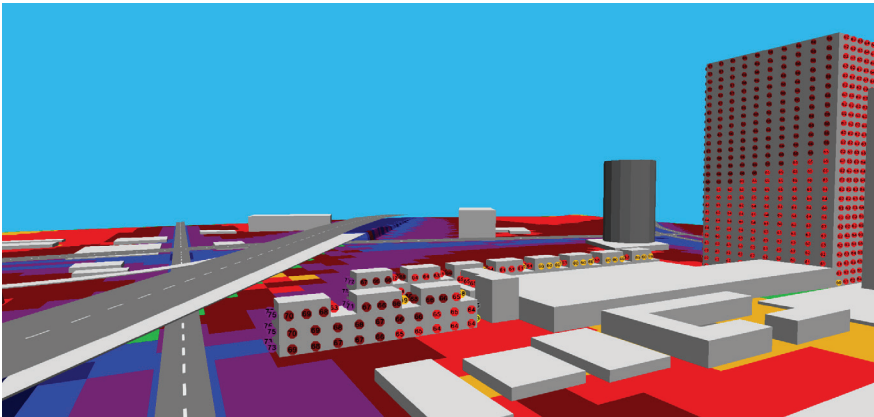
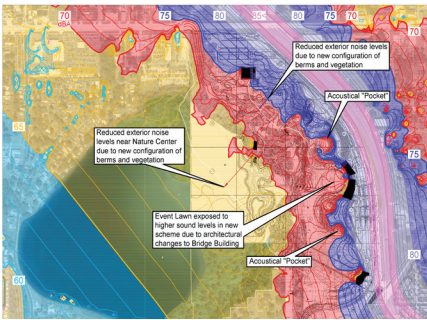
City of Fort Lauderdale
Acoustic Consultant to
Develop Noise Analysis and
Identify Noise Contours

RFP # 12655-225

625 NW 60th Street, Suite C
Gainesville, Florida 32607
USA

(T) 352.331.5111
(F) 352.331.0009

www.SiebeinAcoustic.com



May 3, 2022

City of Fort Lauderdale
100 N. Andrews Avenue
Fort Lauderdale, FL 33301

**Acoustic Consultant to Develop Noise Analysis and Identify Noise Contours
RFP # 12655-225**

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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. Please identify the person who is authorized to negotiate for the team and indicate that the proposal represents a firm binding offer for 120 days. Indicate business structure, IE: Corp., Partnership, LLC. Firm should be registered as a legal entity in the State of Florida; Minority, Disadvantaged or Woman owned Business (if applicable); Company address, phone number, fax number, E-Mail address, web site, contact person(s), etc. The executive summary should also summarize the key elements of the proposal.

Siebein Acoustic; Professor Martin Gold and the University of Florida School of Architecture; and Professor Jeffrey Huber and the Florida Atlantic School of Architecture have formed the Soundscape Team to help the City of Fort Lauderdale address the noise-related issues that are currently being experienced. We like to think of this as the Fort Lauderdale Soundscape Study so that the positive potentials for enriching urban life and development can be identified and planned for rather than thinking about possible negative connotations of noise as something to be taken away. One of the hallmarks of soundscape theory is the thought that the sounds in urban areas are the results of the activities of people as they live, work, play and otherwise engage the City in their daily lives. Therefore, these sounds are necessary to the functioning of the City and its citizens. The creative soundscape design process envisioned by our team involves working with the citizens and the City to reimagine the urban fabric and create environments where these activities can prosper and contribute in a positive sense to the life of each of the citizens, both now and in the future.

The Soundscape Team is uniquely qualified to address the combination of sonic, architectural, planning and urban design-based solutions likely required to sustainably and comprehensively address the complex soundscape of a vital and growing city in the 21st century. We will utilize state-of-the-art methods in acoustical measurement and analysis, visualization, architecture and planning to creatively address current and future soundscape issues in representative districts, zones and/or neighborhoods in the City of Fort Lauderdale. We will employ a comprehensive palette of strategies to preserve and enhance desirable sounds; reduce, buffer and mitigate unwanted sounds; and carefully insert new activities and new sounds into the Ft. Lauderdale soundscape. We will use these strategies to work very closely with City staff and neighborhood groups to address the areas of acoustic concern in each of the areas studied to collaboratively engage all the stakeholders in the process. We are hoping that these methods can bring consensus among stakeholders, bring direction to each of the planning efforts to enhance the existing environments and that new construction can bring positive improvements and excitement to the already lively and invigorating urbane place to live, work, play, vacation, shop, dine, relax and visit that is Fort Lauderdale.

Officer: Rita A. Siebein, President

Principals: Gary W. Siebein, Senior Principal Consultant
Keely Siebein, Associate Principal Consultant

Supervisory Staff: Gary W. Siebein, Senior Principal Consultant
Keely Siebein, Associate Principal Consultant

Key Individuals:

- Gary W. Siebein, Senior Principal Consultant, Siebein Associates, Inc. (Gainesville FL)
- Keely Siebein, Associate Principal Consultant, Siebein Associates, Inc. (Gainesville FL)
- Gary Siebein, Jr., Senior Consultant, Siebein Associates, Inc. (Gainesville FL)
- Marilyn Roa, Senior Consultant, Siebein Associates, Inc. (Weston, FL)
- Jennifer Miller, Senior Consultant, Siebein Associates, Inc. (Gainesville FL)
- Matthew Vetterick, Senior Consultant, Siebein Associates, Inc. (Gainesville FL)
- Martin Gold, Associate Professor, University of Florida, School of Architecture (Gainesville, FL)
- Jeffrey E. Huber, Associate Professor, Florida Atlantic University, School of Architecture (Fort Lauderdale)

Person Authorized to Negotiate for the Team: Gary W. Siebein, Senior Principal Consultant

Our proposal represents a firm binding offer for 120 days.

Business Structure: S Corporation

Siebein Associates, Inc. is registered as a legal entity in the State of Florida and as a Woman Owned Business.

Company address: 625 NW 60th St., Ste. C
Gainesville, FL 32607

Phone number: 352-331-5111

Fax number: 352-331-0009

E-Mail address: GSiebein@SiebeinAcoustic.com

Website: www.siebeinacoustic.com

Contact person: Gary W. Siebein, FAIA, FASA

Firm Introduction

Siebein Acoustic is a leading acoustical consulting firm established in 1981 headquartered in Gainesville, Florida. We have a broad range of diverse experience in acoustical design and research that enables us to provide state-of-the-art consulting services. We pioneered the development of soundscape design methods to assess, measure, model, simulate and predict the acoustical qualities of complex urban environments. We have formed a team (Soundscape Team) specifically for this project with Professor Martin Gold from the School of Architecture at the University of Florida and Professor Jeffrey Huber from the School of Architecture at Florida Atlantic University and their

students. The Soundscape Team will be able to address the unique goals, challenges and complexity associated with the sonic issues the City of Fort Lauderdale is trying to address. Our combined expertise of a highly skilled and experienced acoustical consulting firm with a strong academic team of award-winning architects researcher/educators brings a broad range of the necessary experience toward integrating acoustical, architectural and urban design strategies in complex, mixed-use, sustainable urban environments. The Soundscape Team has demonstrated an ability to work closely with stakeholders and to provide viable strategies for community-based projects at multiple scales nationally, within Florida, and within the Fort Lauderdale Area. Collectively, this work has shaped public policy, helped craft standards in acoustics, prioritized millions of dollars in municipal spending, and has been implemented within municipal codes.

Siebein Acoustic specializes in the design of spaces for natural acoustic and amplified performances in many different venues. We have pioneered the use of advanced acoustical measuring systems to evaluate acoustical challenges in indoor and outdoor spaces as well as computer modeling methods to assess prospective design solutions.

We employ advanced technical systems to assess the sonic environment in urban and suburban landscapes and are well prepared to collaborate with UF and FAU to provide the services outlined in the City of Fort Lauderdale's RFP.

Siebein Acoustic has completed work on over 2,400 challenging projects worldwide and are considered one of the premier acoustical consulting firms in the world. We have received awards for research and acoustical design from the American Institute of Architects, the Association of Collegiate Schools of Architecture, the National Council of Acoustical Consultants, and Progressive Architecture.

Siebein Acoustic is a growing firm with trained professionals who have significant educational and project experience in acoustics, soundscape design, environmental noise and architectural acoustic design. This expert team is well-equipped in-house to perform the field measurements necessary for this project. All equipment utilized will be in conformance with ANSI, ASTM, ISO and other standards for most acoustic situations. Our staff is well versed in using the latest industry standard computer software to model the sonic environment at urban, building, and individual room scales.

The Soundscape Team will achieve high quality sonic environments in Fort Lauderdale using advanced technology, critical listening by experienced staff, and collaboration with municipal representatives, civic leaders, and stakeholders. We achieve this by utilizing a combination of advanced research, extensive project experience, innovative acoustical design techniques, and a team-oriented approach to work in a fully integrated manner with clients, architects, user groups, and other key design team members to establish unique acoustical identities and develop appropriate acoustic management strategies.

Professor Martin Gold has worked with Siebein Acoustic on community design projects that seek to integrate emergent high density mixed-use development and civic spaces within the ecology of local environments. This work evaluates natural resources, climate, urban form, demographics, building types, and the sonic environment toward developing quality sustainable living environments. Examples of this work include the SW 20th Avenue Urban Village project for the Alachua County Metropolitan Transportation Planning Organization who has adopted and is still implemented these

ideas 15 years later. Our partnership also includes work for Plum Creek (now Weyerhaeuser) to propose ecological development strategies for a new community of 20,000 people east of Gainesville, Florida. This development concept nested together high-density housing, mixed-use commercial, institutional, and active agriculture activities. This mode of research/evaluation/response that considers complex ecologies – urban, sonic, cultural, and natural – has produced strategies to optimize the value of high-density living while mitigating many of difficulties of proximity such as noise. The complexities of urban environments such as Fort Lauderdale, will require a diverse team with expertise in acoustics, urban design, urban infrastructure, community engagement, and architecture. Our professional/academic Soundscape Team will be able to leverage student participation toward a broad research effort while also being able to focus those findings in a manner that is useful to community leaders and planning staff who are responsible for improving their urban environments.

Professor Gold has over twenty-five years of experience in architectural design, teaching, and research with a focus on the interrelationships among architecture, ecology, culture, and resource stewardship at urban and residential scales. He is a member of the Doctoral Research Faculty, supervises doctoral and master degree seeking students, and leads design studios and lecture courses at the University of Florida. His work and publications explore design and sustainable living in coastal communities underpinned by the critical need for integrating resiliency, mobility, and aesthetics that drive emergent urban forms. Gold served as the Director of the UF, School of Architecture from 2008 to 2014. He founded the CityLab satellite programs in Orlando and Sarasota, Florida to bring UF students into closer contact with the both the profession and the communities they will serve. He currently leads funded research-based design projects and is a founding member of the Florida Resilient Community Initiative (FRCI) at the UF College of Design Construction and Planning and serves as the President of the national consortium of academic programs Architecture + Construction Alliance (A+CA). He practices architecture as the principal of a small award-winning architecture firm; is a registered architect in Florida; holds an NCARB certification; and is a Fellow of the American Institute of Architects.

Professor Jeffrey Huber is an award-winning architect, landscape architect and urban designer that has designed and overseen construction of numerous public works projects, including over 15 public park plans. He has served as project manager for various municipal streetscape improvements, urban plazas, public art projects, municipal and private parks including waterfront parks, ecological stormwater infrastructure, public realm improvements and building/structural projects. This experience includes design, technical, planning, permitting, construction documents and construction administration services. Clients include municipalities, state and national agencies, and community redevelopment agencies. His experience in design and construction services and years at a community design center have allowed him to deliver projects on schedule and within the stated project goals, satisfying client and stakeholder requirements. His diversity of project experience situates him in a unique position as a Soundscape Team member for this project, where public engagement, and the design of the public realm will surely be required. Huber will serve as the local team project manager and ensure that all key project personnel and city staff have a local point of contact throughout the project duration. Huber will also manage FAU student participation.

Jeffrey Huber is an Associate Professor and MetroLab Director at Florida Atlantic University School of Architecture in downtown Fort Lauderdale. He is also a Principal at Brooks + Scarpa Architects with an office in Fort Lauderdale. He is a registered architect and landscape architect in the State of

Florida. With 20 years of professional experience, his work focuses on interdisciplinary public projects that combine ecological, landscape, urban, and architectural design. Huber has advanced sustainability educational and professional initiatives in agricultural urbanism, green school design, missing-middle housing typologies, Transit-Oriented Development and Low Impact Development. Huber's research, teaching, and design work have garnered numerous national awards, including multiple Progressive Architecture Awards, National Institute Honor Awards in Urban Design from the The American Institute of Architects (AIA), The American Society of Landscape Architects (ASLA), American Architecture Awards and the American Collegiate Schools of Architecture (ACSA).

His professional work has been published in hundreds of books and periodicals including Architect Magazine, Residential Architect, and Architectural Record. Huber has taught at the University of Florida, Mississippi State University, University of Southern California and University of Arkansas.

Huber has published numerous articles and delivered dozens of papers at conferences around the world on the topic of landscape urbanism, transportation and other issues regarding planning cities and neighborhoods. He was previously the Assistant Director of the Arkansas Community Design Center, an internationally recognized outreach center that works with communities and governmental agencies pro bono. He has also previously worked in Miami for Zyscovich Architects, Inc., Birse Thomas Architects in Palm Beach and Howard Davis Associates Architects, P.A. in Saint Augustine.

Soundscape Planning and Design

Siebein Acoustic has successfully completed hundreds of environmental noise assessments involving a variety of urban soundscape, amplified entertainment, traffic, aircraft and noise ordinance issues. Our company motto reflects our background, skills and direction for the future as it applies to sound studies: ***“Intelligently designing architectural, urbane and natural soundscapes for creative and healthy living.”*** This succinctly addresses the contribution that our firm can bring to your project.

Our projects include a combination of environments, cityscapes and facilities that are operating at the time of the study as well as those that are being designed. Successful completion of a sound study requires sophisticated experience with both of these project types to accurately characterize the existing situation and then to creatively optimize the quality of sounds for retail/entertainment/commercial venues while maintaining the quality of the soundscape in near-by residential areas.

Important components of these projects include:

- Measuring ambient or baseline sound levels in rural, suburban and urban areas that have multiple constituent sounds;
- Rigorously defining each of the specific acoustic events in long term measurements that comprise the ambient sound in specific locales so the contribution of each to the total ambient is identified; and,
- Accurately measuring the time, frequency and operational variables associated with multiple permanent, transient and temporary sound sources.

The Siebein Acoustic/Gold UF/Huber FAU team (Soundscape Team) engages in intelligent processes for each work task that helps to build consensus among multiple stakeholders and can clearly present the rationale for each step in the process. We believe that value engineering and

optimizing noise mitigation designs for maximum sound reductions can be achieved within limited project budgets.

We construct sophisticated computer models in state-of-the-art software that are accurately calibrated to real world situations and have high degrees of explanatory power toward building confidence among the multiple parties that will be involved in this City of Fort Lauderdale project.

We execute work that pushes the state-of-the-art in accordance with national and international standards so our recommendations are both legally defensible and creative in the solutions provided. We actively seek a balance among regulatory agencies and laws, community interests, sustainable economic growth and value to all parties involved.

Presenting Complex Information to Multiple Constituencies

Senior Principal Gary W. Siebein is a professor emeritus in the School of Architecture at the University of Florida where he directed a graduate program in building and environmental acoustics for 35 years. In this capacity he has lectured at universities, colleges, standards committees, professional societies, community groups, governmental agencies, and other groups and has served on national and international committees involved with acoustical research and standards.

Siebein was a consultant to the European Union's Collaboration on Science and Technology (COST) program on the Soundscape of Cities and Towns. His work in this role was published widely and is the subject of a current book chapter in the forthcoming SHAR Handbook of Soundscapes. He was awarded the Wallace Clement Sabine Medal by the Acoustical Society of America in recognition of this work. He was only the 17th person to receive this award in the history of the society indicating its significance in the architectural and environmental acoustics community. He has also presented continuing education workshops to planners in Seattle, Portland and Baltimore on ways to incorporate soundscape design in planning and zoning for future growth and urban livability through an outreach program sponsored by ASA. Successfully completed projects with cities, towns, public and private clients to address issues similar to those that will be addressed in the Fort Lauderdale project. The Martin Gold/UF/Siebein Acoustic team has addressed similar issues together in the Urban Village: Transportation and Planning Strategies for SW 20th Avenue project in Gainesville that linked urban design, planning, noise modeling and mapping and future growth strategies for a developing community in a very positive manner.

This experience of distilling essential information in a way that is understandable by non-technical citizens and governmental agencies is a hallmark of our practice. We have presented the process and results of noise studies to City and County regulatory agencies, planning commissions, Boards of Commissioners and other governmental agencies. We have also conducted acoustical training and certification classes for professional continuing education, private industries and public agencies so that their staff can effectively monitor sounds when needed.

The extensive use of auralizations (sound event simulations) or calibrated listening experiments allow stakeholders to actually hear the acoustical aspects of potential mitigation options. Our visualizations of sound paths as rays or waves allow stakeholders to see the paths that sound travels and why this may be causing issues. These auralization and visualization techniques help citizens, governmental agencies and stakeholders understand the causes of situations so they can appreciate the need for and the effectiveness of proposed solutions.

This work has included full scale simulations of amplified entertainment sounds and sounds from chiller plants and other large equipment presented to the community through large loudspeaker arrays located on the existing or proposed project site. The sound is scientifically modeled, measured, and propagated through a potentially affected neighborhood so people can listen and hear for themselves what proposed new activities will sound like inside their homes and yards, on the street while they walk their dogs, and at other locations close to home. The acoustical affects of proposed projects and interventions can be qualitatively assessed by those people living in their everyday environment before a project is built. This process has helped to build consensus about the qualities of alternate approaches to a project among City staff, residents, project proponents and other stakeholders in sonically critical situations.

Siebein Acoustic has also acted as an expert witness for many projects involving acoustical issues for amplified entertainment venues, large amphitheaters, entertainment districts in cities and towns, traffic noise impacts and soundscape quality in residential neighborhoods are among the project types we have worked on.

We specialize in taking acoustical measurements that accurately characterize the sounds as they are experienced by people, conducting acoustical analysis of the data that allows us to identify the paths responsible for the sounds that are being heard and designing effective mitigation systems using the full range of available technologies including infrastructure interventions, administrative controls and sound system controls to achieve a balance between the acoustical quality at the venues and the soundscape in adjacent areas.

We are prepared to conduct field measurements; review existing facilities to identify sound sources; review current ordinances and evaluate their effectiveness; develop models to predict future impacts of sound transmission; provide a plan to assist in the mitigation of existing and future noise impact to find practical and economical solutions to a number of challenging acoustical situations; and to present the results to citizen groups, project stakeholders, planning and zoning boards, commissions and other groups.

We take pride in our ability to translate technical acoustical principles into language that clients, city legal staff, enforcement personnel and citizens can understand. Gary W. Siebein, Senior Principal Consultant and Keely M. Siebein, Principal Consultant are qualified as experts in multiple districts and have presented expert witness testimony in court, at quasi-judicial hearings for city and county commissioners, and for a number of planning and zoning boards. They have developed the ability to distill complex acoustical concepts into language that is easily understood by lay persons through years of experience teaching students and lecturing to technical and non-technical audiences.

Regulatory, Contractual and Jurisdictional Matters

The Soundscape Team has worked with many states, counties and municipalities to proactively address planning and design principles to optimize acoustical qualities of vital mixed-use urban environments while simultaneously balancing the acoustic impacts of noise upon residents. Noise from entertainment venues, large crowds, traffic, various modes of transportation, mechanical equipment, industrial facilities, etc., must be effectively managed within the complex soundscape of an urban community.

We work with government agencies and private and public sector clients to:

- Prepare acoustical assessment reports for existing and proposed projects;
- Review development proposals;
- Develop acoustical master plans for the soundscape of livable, urban communities;
- Determine compliance with ordinances or specific acoustical requirements established by local jurisdictions;
- Perform measurements and analyses to quantify acoustical levels and/or locate noise source(s);
- Predict future noise levels using sophisticated modeling techniques;
- Design and/or recommend appropriate mitigation measures to reduce noise to acceptable levels;
- Draft, review, modify and/or update noise ordinances to achieve a working balance between urban vitality, areas of repose and residential serenity.

We achieve reasonable balances between the various complex interactions of multiple stakeholder groups and can effectively present realistic aural sound event simulations to groups in public forums so individuals may aurally sample acoustical “sketches” of various design options. This allows effective communication of the acoustical consequences of planning decisions and associated costs.

Noise Ordinance Review and/or Development

We have worked with many communities to develop and/or revise noise ordinances that are suited to the unique acoustical situations of each locality. We strive to achieve a practical balance between the desires of residents for high quality urban and suburban life styles in rapidly growing and redeveloping communities with the needs of businesses and industries to grow and prosper. We bring advanced measuring techniques to assess the qualities of the soundscape, or acoustical landscape, of each community to the project. These techniques have been developed through Professor Siebein’s research at the University of Florida. This is an interactive process involving city planners, business owners and residents designing for positive sonic qualities in communities to enhance the quality of urban life while reducing, buffering and mitigating undesirable sounds before they arise.

Municipalities including Dunedin, Sarasota, Bradenton, Tampa, and Daytona Beach in Florida and Hilton Head Island, South Carolina have engaged our firm to develop sophisticated ordinances that are necessary to build a sense of community between the residents and commercial enterprises that comprise the fabric of the new American urban center. One of the principles for legal requirements for defensible noise ordinances is that the ordinance is tailored to the distinct acoustic environments of the specific community. Therefore, we measure and monitor ambient sound levels within the environment so that a detailed profile of the sonic variance within communities can be developed.

Firm Innovation

The Soundscape Team has developed innovative urban and soundscape design, analysis and mitigation approaches to create healthful sonic environments. This work has been widely published by Senior Principal Gary Siebein and Professor Gold and has helped define the field of applied soundscape and urban design. His latest publication is a book chapter in a soundscape design handbook forthcoming from Springer.

This process can limit the impact of potential noise sources and optimize the points-of-view of all stakeholders with highly creative, technically sophisticated acoustical solutions. We use an

interactive process to explore design solutions through a multi-disciplinary effort that includes the Client, county planners, government officials, developers, design team members, and citizens.

The soundscape design and planning process involves:

- Soundwalks to identify acoustic zones and issues;
- Focus group discussions and evaluation to identify issues and concerns;
- Long term monitoring of sound levels at critical locations;
- Short term measurements and calibrated recordings of specific acoustic events that comprise the ambient with adequate resolution to distill the source and meaning of the many sounds that comprise the ambient;
- Mapping of existing and proposed situations;
- Modeling of proposed interventions;
- Auralizations or sound event simulations of potential solutions for review by focus groups.

We have developed a method to analyze potential noise impacts from new developments and large scale projects to allow detailed enough assessment of the sounds at individual locations in a community to design for true “net zero” noise impacts when this is necessary to achieve. In other words, facilities and activities that produce sounds that travel off-site can be designed so that they can achieve sound levels that are within the range of existing background sound levels even under adverse weather conditions. This important analysis technique has been refined through our design work for a number of private and municipal clients facing severe acoustical challenges.

If the situation allows, a weighted sound pressure multiplied by the number of impacted properties can provide a reliable quantitative metric to assess the number and magnitude of impacted properties for a base condition and to guide mitigation options. This approach has been successfully used to evaluate potential impacts and the viability of alternative mitigation options from shooting ranges among other project types and can be easily transferred to amplified entertainment venues.

Our Process

Our typical process for soundscape assessment and design includes, but is not limited to:

- Project Kick-off, Work Plan and Initial Research
 - Initial Meeting
 - Public outreach meetings with City staff, business owners, residents, citizens’ groups and other stakeholders
 - Work plan preparations
 - Data review from previous studies and events
 - Literature Review
 - Local media reviews
 - Review meetings with Stakeholders
- Comprehensive Sound Study
 - Gather GIS, topographic and other data available for noise mapping
 - Identify areas of concern through stakeholder participation, sound walks and documentation

- Pilot study of one area of concern
- Studies of 6 to 10 specific prioritized areas of concern, the results of which can ideally be translated to the broader community
- Soundwalks
- Sound Level Measurements
- Analysis of Measurement Data
- Reports and Presentations of Initial Findings
- Recommendations
 - Current sound impacts
 - Future areas of concern based on computer models of existing and future soundscape components
 - Proposals to fine tune noise ordinance provisions
 - Proposals for sound monitoring systems
 - Planning, Architectural, Engineering and Design options for sonic and mitigation interventions to address current and future noise related issues
 - Computer model studies of current and future soundscapes, modeling of possible design interventions and data analysis
 - Municipal code revisions or additions
- Final Reporting

4.2.3 Experience and Qualifications

Indicate the firm’s number of years of experience in providing the professional services as it relates to 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. Relative size of the firm, including management, technical and support staff; licenses and any other pertinent information shall be submitted.

Firm’s number of years of experience in providing the professional services as it relates to the work contemplated: 41

Details of past projects for agencies of similar size and scope, including information on your firm’s ability to meet time and budget requirements:

Partial Listing:

<i>Project Name</i>	<i>Client</i>	<i>Size</i>	<i>Construction Cost</i>	<i>On Time/On Budget</i>
Aaron Bessant Park Amphitheater, Panama City Beach, FL	DAG Architects	2,400	\$2.5M	Yes
Aurora Mixed-Use Development, Tampa, FL	The Richman Group of Florida	Unknown	\$56M	Yes
Bonnet Springs Park Soundscape Design and Planning, Lakeland, FL	Sasaki	168 acres	\$110M	Yes

<i>Project Name</i>	<i>Client</i>	<i>Size</i>	<i>Construction Cost</i>	<i>On Time/On Budget</i>
Capitol View Mixed-Use Development, Nashville, TN	Cooper Cary	232,300	\$750M	Yes
Center Place Mixed-Use Development, Fort Myers, FL	Private Equity Group, LLC	886 acres	Unknown	Yes
Clay County Animal Shelter, Clay County, FL	MLM-Martin Architects	32,000	\$11.7M	Yes
Dunedin Noise Ordinance, Dunedin, FL	City of Dunedin	Est. 30 city blocks	N/A	Yes
Grassy Waters Preserve Traffic Noise Study Environmental Acoustic Assessment, West Palm Beach, FL	Tew Cardenas, LLP	23 sq miles	Unknown	Yes
Imagine Clearwater Coachman Park Amphitheater, Clearwater, FL	Stantec	24 acres	\$64M	Yes
Lake Nona Community Noise Monitoring Mapping and Land Use Compatibility Study, Lake Nona, FL	Arquitectonica	Unknown	N/A	Yes
Manatee County Noise Ordinance	Manatee County	Multiple	Unknown	Yes
Marie Selby Botanical Gardens, Sarasota, FL	Kimley-Horn and Associates, Inc. Marie Selby Botanical Gardens	15 acres	\$92M	Yes
Michigan Department of Natural Resources Statewide Outdoor Shooting Ranges	Michigan Department of Natural Resources	Statewide	Unknown	Yes
Moffitt Cancer Center Magnolia Campus Central Utility Plant, Tampa, FL	H. Lee Moffitt Cancer Center	26,000	\$10M	Yes
One Ashley Mixed-Use Development, Tampa, FL	Arquitectonica + Adache Group Architects	Unknown	Unknown	Yes
One West Palm Mixed-Use Development, West Palm Beach, FL	Arquitectonica	1.5M ft ² total; 150,000 office space	\$1.6B	Yes
Plaza at Coral Gables Mixed-Use Development, Coral Gables, FL	CRTKL	4.5M ft ² total; 650,000 office space	\$400M	Yes
Ringling College of Art + Design Chiller Plant and Full Scale Simulation	Hall Architects	Approximately ¼ mile x ¼ mile area	Unknown	Yes
Sarasota Memorial Hospital Chiller Plant Full Scale Simulation	Sarasota Memorial Hospital	Approximately ½ mile x ½ mile area	\$63M	Yes
Soundscape Analysis and Acoustical Design Strategies for an Urban Community Development, Gainesville, FL	University of Florida	160 acres	Unknown	Yes

<i>Project Name</i>	<i>Client</i>	<i>Size</i>	<i>Construction Cost</i>	<i>On Time/On Budget</i>
Tampa Airport SkyCenter One Office Building, Tampa, FL	HOK	270,000	\$122M	Yes
Tampa General Hospital NICU Soundscape, Tampa, FL	Harvard Jolly Architecture	53,000	\$35M	Yes
The Villages Florida Turnpike Planning, The Villages, FL	The Villages	10,000 acres	Unknown	Yes
UF Health Shands Cancer Hospital CUP, Gainesville, FL	Flad and Associates, Inc.	520,000	\$415M	Yes
UF Malachowsky Hall for Data Science and Information Technology Building, Gainesville, FL	Bohlin Cywinski Jackson	263,000	\$150M	Yes
Ybor City Noise Ordinance	RBK Architecture and Ybor City Development Corporation	Est. 14 city blocks	N/A	Yes

Firm’s initiatives towards its own sustainable business practices that demonstrate a commitment to conservation:

One of the primary tenets of sustainable design is to design environments to enable the highest use of resources and to establish meaningful relationships among users of the building and the environments in which they dwell. Communication builds strong communities and enables the active participation of many diverse constituents in civic discourse. Sustainable acoustical design principles allow this discourse to occur through multiple media; ie: face to face verbal communication, broadcast, recorded, video display, and/or propagated over AV systems in the building. By optimizing these communication channels, we seek to tune the space to the needs of the user groups and enhance the acoustic environment.

Sustainable acoustical design enables high quality communication to occur in theaters, amphitheaters, city halls, offices, auditoriums, libraries, boardrooms, and any other space where communication occurs. Through careful design of the shape, materiality and textures of the surfaces, we seek to enhance the human experience of gathering for civic purposes and establishing a sense of community. Each room type has specific functions it must serve and each community has their own ways in which they would like to inhabit the space. By defining the acoustic program of each space and developing custom interventions based on the room type and users’ functionality preferences, we create more sustainable, healthful, and optimized environments.

LEED criteria for indoor environmental quality recognize the importance of this goal by establishing performance criteria for reverberation and background noise in civic buildings, schools and healthcare occupancies. These same design elements contribute to the long-term efficiency of high performance collaborative work and gathering spaces. Using LEED criteria and/or other sustainable design criteria as a foundation and building from that the acoustic priorities of each building, we can effectively use the building assembly systems and room finishes to provide the type of desired acoustic environment. Through our 41 years of experience in acoustic research and design, we apply

our understanding of the building's acoustic optimization and tailor each space to provide the most robust acoustic performance within the programmatic and budgetary requirements of the project.

Relative size of the firm, including management, technical and support staff; licenses and any other pertinent information.

Size of Siebein Associates, Inc.: 8 people including management, technical and support staff.

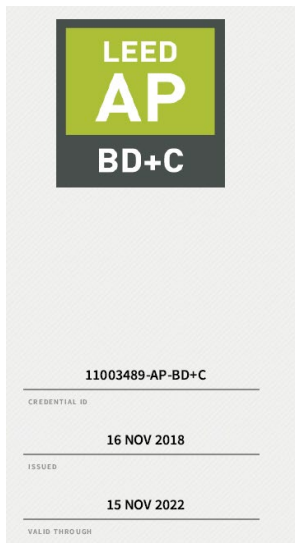
Rita A. Siebein, President

Gary W. Siebein, FASA, FAIA, NCARB
Senior Principal Consultant
Registered Architect Florida # 8846
NCARB # 86214





Keely Siebein, ASA, INCE, LEED AP BD+C
 Associate Principal Consultant
 USGBC 11003489-AP-BD+C



GREEN BUSINESS CERTIFICATION INC. CERTIFIES THAT

Keely Siebein

HAS ATTAINED THE DESIGNATION OF

LEED AP® Building Design + Construction

by demonstrating the knowledge and understanding of green building practices and principles needed to support the use of the LEED® green building program.

Mahesh Ramaraju

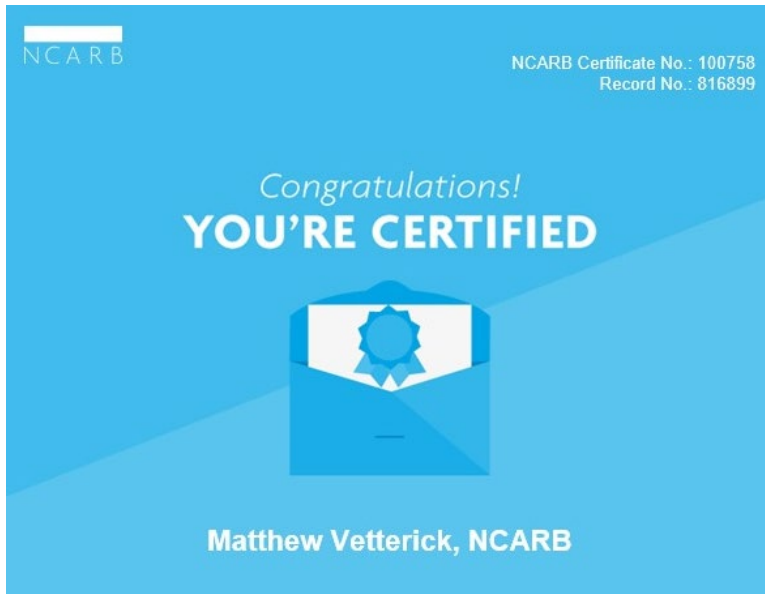
MAHESH RAMARAJU
 PRESIDENT & CEO, U.S. GREEN BUILDING COUNCIL
 PRESIDENT & CEO, GREEN BUSINESS CERTIFICATION INC.

Marylin Roa, AIA, ASA, INCE
Senior Consultant
Registered Architect Florida # AR100453



Matthew Vetterick, AIA, NCARB
Senior Consultant
Registered Architect Florida # AR101159
NCARB # 100758





Gary Siebein Jr., CTS, AVT
Senior Consultant
Certified Technology Specialist
InfoComm Audio Visual Technologist



Jennifer Miller, Assoc. AIA, ASA
 Senior Consultant
 Associate AIA Member

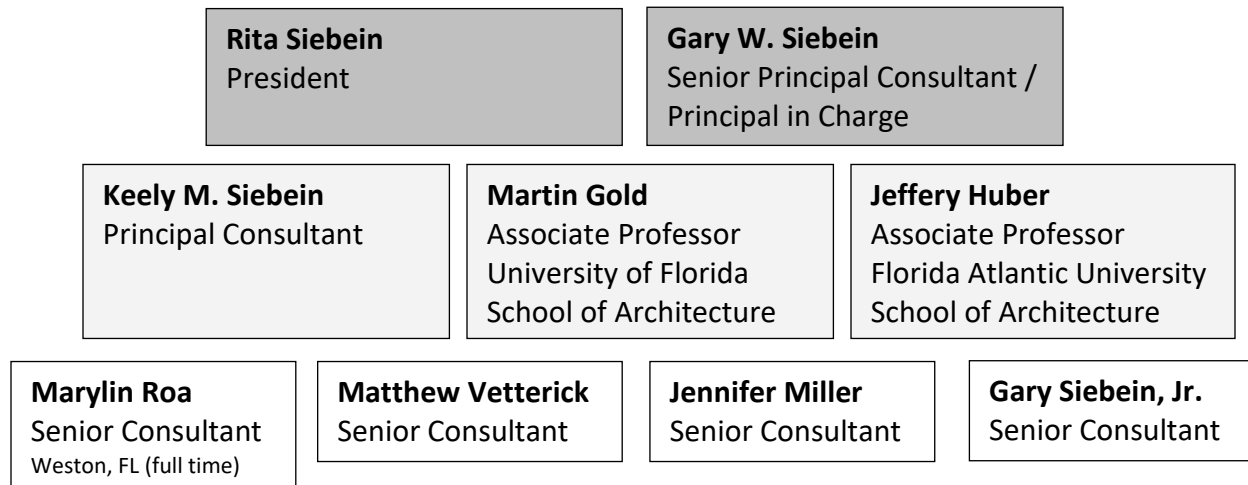
Rebecca Sutphin
 Office Manager, Marketing Assistant

Identify a single point of contact (project manager) and all key team members, including relevant experience. Include a statement that key team members will not be removed or reassigned without prior approval of the City. Provide an organization chart of how the key staff is structured within the organization and include all specialty sub-consultants that would be expected to be utilized on the project.

Key team members will not be removed or reassigned without prior approval of the City.

Point of Contact/Project Manager: Gary W. Siebein

Siebein Acoustic Organizational Chart for this Project:



Staff Roles and Responsibilities

Name	Role	Responsibility
Gary W. Siebein, FASA, FAIA	Principal-in-Charge	Director of Acoustical Design and Analysis, Overall Project Direction, Quality Control Review of Work, Client Relations, Experimental Design, Field Measurements

Name	Role	Responsibility
Martin Gold, FAIA, NCARB	Soundscape Team Lead	Identify noise contours, analyze noise and sound in a range of urban areas, conduct sound walks, and will propose strategies toward adopting standards for measuring sound and qualifying sound. Lead the UF student teams in the development of strategies for mitigating sound transmission (urban and building to building) will be developed in addition to detecting and enforcing violations of reasonable maximum permissible sound limits.
Jeffrey E. Huber, FAIA, NCARB, LEED AP, MLA	Soundscape Team Lead	Identify noise contours, analyze noise and sound in a range of urban areas, conduct sound walks, and will propose strategies toward adopting standards for measuring sound and qualifying sound. Lead the UF student teams in the development of strategies for mitigating sound transmission (urban and building to building) will be developed in addition to detecting and enforcing violations of reasonable maximum permissible sound limits.
Keely Siebein, ASA, INCE, LEED AP BD+C	Associate Principal Consultant	Project Manager, Acoustical Design and Analysis, Soundscape Design, Stakeholder Meetings, Qualification and Proposal Preparation, Soundscape Measurements and Calibration Studies, Data Review, Manage Data Analysis and Report Production
Gary Siebein, Jr., CTS	Senior Consultant	AV Systems Design, Soundscape and Environmental Noise Measurement, Project Data Analysis and Field Measurements
Marylin Roa, AIA, ASA, INCE	Senior Consultant Weston, FL	Project Manager, Lead Acoustical Designer, 3D Acoustic Computer Modeling, Field Measurements and Calibration Studies, Interior Room Acoustic and Finish System Design, Project Data Analysis and Technical Assistance with Report Preparation
Jennifer Russell, Assoc. AIA, ASA	Senior Consultant	Soundscape Analysis and Acoustical Measurement, Project Data Analysis and Field Measurements, HVAC System Noise and Vibration Control Design, Architectural Acoustic Design, Sound Isolation System Design, Acoustical Finish Systems
Matthew Vetterick, AIA, NCARB	Senior Consultant	Computer Modeling, Field Measurements, Project Data Analysis and Technical Assistance with Report Preparation HVAC System Noise and Vibration Control Design, Sound Isolation System Design, Architectural Acoustic Design
Rita A. Siebein	President	Firm Management, Marketing and Financial Operations
Rebecca Sutphin	Office Manager/Marketing Assistant	Project setup, timekeeping, invoicing; marketing assistance

Consultant Relevant Experience (partial lists):

Gary W. Siebein, FAIA, FASA, NCARB:

Bonnet Springs Park Soundscape Design and Planning, Lakeland, FL
Capitol View Mixed-Use HUD Traffic and Rail Noise Study, Nashville, TN
City of Chesapeake Noise Ordinance Study, Chesapeake, VA
Coachman Park Amphitheater, Clearwater, FL
Daytona Beach Bike Week Noise Impact Analysis, Daytona Beach, FL
Daytona Beach Noise Amendment Review, Daytona Beach, FL
Dunedin Entertainment Noise Study, Dunedin, FL
GL Homes Greystone HUD Noise Assessment, Palm Beach, FL
Grassy Waters Preserve Environmental Acoustic Assessment, Palm Beach, FL
Harry P. Leu Gardens Sound and Soundscape Study, Acoustical Design, Orlando, FL
Imagine Clearwater Coachman Park Soundscape Study, Clearwater, FL
Island Lake Recreational Shooting Range Noise Impact Analysis, Brighton, MI
Lake Nona Community Noise Monitoring Mapping and Land Use Compatibility Study, Orlando, FL
Luxury Shopping Mall Construction Noise Monitoring, Noise Measurement Training, South Florida
Marie Selby Botanical Gardens Sound and Soundscape Study, Noise Ordinance Review, Sarasota, FL
MI Department of Natural Resources Statewide Outdoor Firing Ranges Sound Studies, Michigan
Mount Dora Noise Ordinance Revision, FL
Murphy Oaks HUD Traffic Noise Study, Venice, FL
Perry Harvey Park Soundscape Analysis, Acoustical Design, Sound System Design, Tampa, FL
Sarasota Deep Bass Thumping Noise Impact Study, Sarasota, FL
Sarasota Memorial Hospital Chiller Plant Full Scale Simulation, Sarasota, FL
The Villages Florida Turnpike Planning Soundscape Analysis and Noise Mitigation, The Village, FL
Traceland HUD Rail and Road Traffic Site Noise Study, Green Cove Springs, FL
Ybor City Noise Ordinance, Ybor City, FL

Martin Gold, FAIA:

Manatee Children's Services Sustainable Planning and Conceptual Design, Manatee County, FL
Hawthorne Village Sustainable Eco-Village, Little Orange Lake, FL
Longboat Key Sustainable Urbanism, Longboat Key, FL
Plum Creek Development, Alachua County, FL
Seaglass Ecological Community, Sanibel, FL
Workscape: Creative Culture Office Parks, Gainesville, FL
Chipley Urban Design and Housing Strategies, Chipley, FL
Waldo Road Center, Gainesville, FL/Alachua County/ UF
Archer Braid: Sustainable Cycle Commuter Corridor, Gainesville, FL/Alachua County
Urban Village SW 20th Avenue Design Visioning, Gainesville, FL/Alachua County
Bicycle Pedestrian Master Plan, Gainesville, FL/Alachua County

Jeffrey Huber, FAIA, ASLA, LEED AP:

DC Alexander Park, Brooks + Scarpa Architects, Inc. City of Fort Lauderdale CRA, Ft Lauderdale, FL
Fort Lauderdale Design and Construction Manual, Brooks + Scarpa Architects, Inc. City of Fort Lauderdale, Fort Lauderdale, FL
Hollywood Beach Streetscapes, Brooks + Scarpa Architects, Inc., City of Hollywood Community Redevelopment Agency, Hollywood Beach, FL
Salty Urbanism, City of Fort Lauderdale, Brooks + Scarpa Architects, Inc., Fort Lauderdale, FL
The Creative Corridor, Brooks + Scarpa Architects, Inc., City of Little Rock, Little Rock, AR

Keely Siebein, ASA, INCE, LEED AP BD+C:

Chesapeake Noise Ordinance Acoustical Review of Proposed Changes, Chesapeake, VA
Clay County Animal Shelter, Middleburg, FL
District Flats HUD Traffic and Site Noise Study, West Palm Beach, FL
East Avenue Towne Lake Site Noise Study, Austin, TX
Gateway Community Services HUD Traffic and Rail Noise Study, Jacksonville, FL
GL Homes Valencia Assemblage Traffic Noise Study, Boynton Beach, FL
Grand Floridian Pool Noise Simulation, Orlando, FL
Grassy Waters Preserve Environmental Acoustic Assessment, Palm Beach, FL
Island Lake Recreational Shooting Range Noise Impact Analysis, Brighton, MI
Imagine Clearwater Coachman Park Sound and Soundscape Study, Acoustical Design, A/V Design, Clearwater, FL
Island Lake Recreational Shooting Range Noise Impact Analysis, Brighton, MI
KB Home Cordova Palms HUD Site Noise Study, St. Augustine, FL
KB Home Livingston Groves Traffic Noise HUD, Hillsborough County, FL
Lake Nona Community Noise Monitoring Mapping and Land Use Compatibility Study, Orlando, FL
Lakewood Ranch Senior Apartments HUD and Computer Models, Manatee County, FL
Lincoln Eatery Site Noise Study, Miami Beach, FL
Lost Groves Mines Environmental Acoustic Assessment, Immokalle, Estero, FL
Luxury Shopping Mall Construction Noise Monitoring and Noise Measurement Training, Bal Harbour, FL
Marie Selby Sound Monitoring and Noise Measurement Training Course, Sarasota, FL
Michigan Department of Natural Resources Statewide Outdoor Firing Ranges Sound Studies, Michigan
ModWash Car Wash Noise Study, Estero, FL
Pasco County Proposed Gun Range Noise Impact Study, Pasco County, FL
Ringling College Chiller Plant Full Scale Simulation, Sarasota, FL
Ritz Carlton Key Biscayne Noise Ordinance Review, Key Biscayne, FL
River Club Proposed Expansion HUD Traffic Noise Assessment, Bradenton, FL
Sarasota Memorial Hospital Chiller Plant Full Scale Simulation, Sarasota, FL
Solar Energy Plant Site Noise Study, Archer, FL
St. Joseph's Hospital NICU, Riverview, FL
Starkey Ranch Micro-Hospital HUD Traffic Noise Study, Starkey Ranch, FL
Suncoast Humane Society Animal Shelter, Englewood, FL
Tallahassee Memorial Hospital NICU Study, Tallahassee, FL
Ybor City Noise Ordinance, Ybor City, FL

Gary Siebein, Jr., CTS, AVT

Aaron Bessant Park Amphitheater Sound Study and A/V Design, Panama City, FL
Bal Harbour Shoppes Parking Facility Expansion Noise, Bal Harbour, FL
Blue Lagoon Rail and Aircraft Noise Assessment (HUD), Miami, FL
Boca Municipal Traffic Noise Study HUD, Boca Raton, FL
Bradenton Motor Sports Park Site Noise Study, Bradenton, FL
Capitol View Mixed-Use HUD Traffic and Rail Noise Study, Nashville, TN
Center Place Proposed Mixed-Use Development Sound Study, Fort Myers, FL
Crane Island Aircraft Noise Study, Fernandina Beach, FL
Creekwood West Commons Traffic Noise Study, Bradenton, FL
Grassy Waters Preserve Environmental Acoustic Assessment, Palm Beach, FL
Hard Rock Park Sound Study, Myrtle Beach, SC
Imagine Clearwater Coachman Park Sound Study and A/V Design, Clearwater, FL
Lake Nona Community Noise Monitoring Mapping and Land Use Compatibility Study, Orlando, FL
Luxury Shopping Mall Construction Noise Monitoring and Noise Measurement Training, Bal Harbour, FL
Manatee County Thoroughfare Noise Stipulation, Manatee County, FL
Michigan Department of Natural Resources Statewide Outdoor Firing Ranges Sound Studies, Michigan
Murphy Oaks Barrier Wall Design, Venice, FL
Murphy Oaks HUD Traffic Noise Study and Sound Barrier Wall Design, Venice, FL
Pasco County Proposed Gun Range Noise Impact Study, Pasco County, FL
Ringling College Chiller Plant Full Scale Simulation, Sarasota, FL
Riva Trace Traffic Noise Study, Manatee County, FL
River Club Proposed Expansion HUD Traffic Noise Assessment, Bradenton, FL
River Haven Burnt Store Road Widening Noise Study, Punta Gorda, FL
Southmeadow High Cube Warehouse HUD Site Noise Study, Orange County, FL
Spirit of Suwannee Hulaween Outdoor Amplified Event Noise Monitoring, Live Oak, FL
Sweetwater Preserve Environmental Acoustic Traffic Assessment, Bradenton, FL
The Harbour Apartments Apollo Road Widening Noise Study, Miami, FL
The Villages Rainey Truck Yard Site Noise Study, The Villages, FL
The Villages Florida Turnpike Planning Soundscape Analysis and Noise Mitigation, The Village, FL
Traceland HUD Rail and Road Traffic Site Noise Study, Green Cove Springs, FL
Union County GA Shooting Range, Blairsville, GA
Wetherbee Road Proposed Apartment Complex (HUD), Orlando, FL
White Rock Station Apartments Railway Station Noise Study, Dallas, TX
Ybor City Noise Ordinance, Ybor City, FL

Marylin Roa, AIA, ASA, INCE

Aurora Traffic Noise Study, Newberry, FL
Banyan Ridge HUD Traffic Noise Study, West Palm Beach, FL
Blue Lagoon Rail and Aircraft Noise Assessment, Miami, FL
Bonnet Springs Park Soundscape Design and Planning, Lakeland, FL
Capitol View Mixed-Use HUD Traffic and Rail Noise Study, Nashville, TN
Center Place Sound Study, Fort Myers, FL

Crane Island Aircraft Noise Study, Fernandina Beach, FL
Dubuque County Sheriff's Range Sound Study, Dubuque, IA
GL Homes Valencia Lake Sound Wall, Sun City, FL
Heron Bay HUD Traffic Noise Study, Manatee County, FL
Imagine Clearwater Coachman Park Sound and Soundscape Study, Acoustical Design, A/V Design, Clearwater, FL
Lake Nona Community Noise Monitoring Mapping and Land Use Compatibility Study, Orlando, FL
Luxury Shopping Mall Construction Noise Monitoring and Noise Measurement Training, Bal Harbour, FL
Marie Selby Botanical Gardens Sound and Soundscape Study, Noise Ordinance Review, Sarasota, FL
Michigan Department of Natural Resources Statewide Outdoor Firing Ranges Sound Studies, Michigan
Murphy Oaks HUD Traffic Noise Study, Venice, FL
North Creek Project Sound Study, St. Augustine, FL
Ringling College Chiller Plant Full Scale Simulation, Sarasota, FL
Solar Energy Plant Site Noise Study, Archer, FL
Standard Purification Noise Monitoring, Dunnellon, FL
Sunrail Maintenance Facility Sanford Noise Study, Sanford, FL
TECO Generator Plant Noise Study, Apollo Beach, FL
The Villages Florida Turnpike Planning Soundscape Analysis and Noise Mitigation, The Village, FL
Verizon Data Center Generator Plant Noise Study, Temple Terrace, FL

Jennifer Miller, Assoc. AIA, ASA

201 W Univ Ave Rooftop Venue Sound Study, Gainesville, FL
Aberdeen Firing Range Sound Study, Aberdeen, MD
Aurora Traffic Noise Study, Newberry, FL
Bonnet Springs Park Soundscape Design and Planning, Lakeland, FL
Catalina at Lake Worth Traffic Noise Study HUD, Lake Worth, FL
Creekwood West Commons Traffic Noise Study, Bradenton, FL
Dunn's Crossing HUD Traffic Noise Study, Jacksonville, FL
East Avenue Towne Lake Site Noise Study, Austin, TX
IMAX VIP Cinemas Trinidad, Port of Spain, Trinidad & Tobago
Interbay Apartment Complex HUD Site Noise Study, Tampa, FL
Kiwi Car Wash Noise Study, Port St. Lucie, FL
Lake Nona Town Center Noise Study, Lake Nona, FL
Marie Selby Sound Monitoring and Noise Measurement Training Course, Sarasota, FL
Michigan Department of Natural Resources Statewide Outdoor Firing Ranges Sound Studies, Michigan
Mr. Clean Car Wash Noise Study, Melbourne, FL
OCPS Site 43 Aircraft Noise Study, Orlando, FL
OCPS Site 83 Aircraft Noise Study, Orlando, FL
Old Cutler HUD Traffic Noise Study, Homestead, FL
Publix 34th St. Gainesville Site Noise Study, Gainesville, FL
Publix Proposed Site Tallahassee Bannerman at Bull Headley Site Noise Study, Tallahassee, FL
Publix Site Noise Measurements Beaufort, SC, Beaufort, SC

Ringling College Chiller Plant Full Scale Simulation, Sarasota, FL
Ritz Carlton Amelia Island Pool Bar Noise, Amelia Island, FL
Luxury Shopping Mall Construction Noise Monitoring and Noise Measurement Training, Bal Harbour FL
Spirit of Suwannee Hulaween Outdoor Amplified Event Noise Monitoring, Live Oak, FL
Standard Purification Noise Monitoring, Dunnellon, FL
Summit County Colorado Firing Range Sound Study, Summit County, CO
Sunrail Maintenance Facility Sanford Noise Study, Sanford, FL
Tampa Police Department Firing Range, Tampa, FL
The Villages Florida Turnpike Planning Soundscape Analysis and Noise Mitigation, The Village, FL
Union County Shooting Range Sound Study, Blairsville, GA
Wetherbee Road Proposed Apartment Complex HUD Noise Study, Orlando, FL
Yanie Road HUD Noise Study, Nassau County, FL

Matthew Vetterick, AIA, NCARB

Banyan Ridge HUD Traffic Noise Study, West Palm Beach, FL
Blue Lagoon Rail and Aircraft Noise Assessment (HUD), Miami, FL
Cordova Palms HUD Site Noise Study, St. Augustine, FL
District Flats HUD Traffic and Site Noise Study, West Palm Beach, FL
Dunn's Crossing HUD Traffic Noise Study, Jacksonville, FL
East Avenue Towne Lake Site Noise Study, Austin, TX
Heron Bay HUD Traffic Noise Study, Manatee County, FL
Lake Nona Community Noise Monitoring Mapping and Land Use Compatibility Study, Orlando, FL
Luxury Shopping Mall Construction Noise Monitoring and Noise Measurement Training, Bal Harbour, FL
Marie Selby Botanical Gardens Sound Monitoring and Noise Measurement Training Course, Sarasota, FL
Michigan Department of Natural Resources Statewide Outdoor Firing Ranges Sound Studies, Michigan
OCPS Site 43 Aircraft Noise Study, Orlando, FL
OCPS Site 83 Aircraft Noise Study, Orlando, FL
Old Cutler HUD Traffic Noise Study, Homestead, FL
Ringling College Chiller Plant Full Scale Simulation, Sarasota, FL
Ritz Carlton Amelia Island Pool Bar Noise, Amelia Island, FL
Solar Energy Plant Site Noise Study, Archer, FL
Spirit of Suwannee Hulaween Outdoor Amplified Event Noise Monitoring, Live Oak, FL
Sunrail Maintenance Facility Sanford Noise Study, Sanford, FL
TECO Generator Plant Noise Study, Apollo Beach, FL
Verizon Data Center Generator Plant Noise Study, Temple Terrace, FL
Wynwood View HUD Noise Assessment, Miami, FL
Yanie Road HUD Study Nassau County, Nassau County, FL

Personnel Categories

1. Senior Principal Consultant

- Mentor project staff in appropriate procedures for each design process analysis technique.
- Observe project meetings conducted by Associate Principal and Consultants with the Client and Design Team.
- Conduct second party QA/QC audit/review of each document produced for each service for each project independently of the project team and project manager with written responses to project staff prior to delivery to the Client.
- Negotiate contracts and fees.
- Review technical scope of each proposal with proposed project team and with insurance agent and corporate attorney when needed.
- Establish work plan and schedule for project in association with Project Manager.
- Review progress of work with PM and staff.
- Stimulate professional development through encouraging participation in CEU programs and attending and/or presenting papers at technical acoustical meetings and standards programs.

2. Associate Principal Consultant

- Serves as project manager for larger projects.
- Interface with clients and design team members to coordinate the acoustical work with the overall design.
- Develop analysis techniques for each acoustical design process.
- Instruct project consultants and junior staff in analysis techniques for specific project design issues.
- Review questions and solutions with project consultants on a daily basis.
- Audit/review reports with the project team prior to review by Senior Principal as a first party audit.
- Conducts review with clients and users to verify conformance of design approaches with client program and criteria.
- Conducts lessons learned discussions with staff after completion of each design phase and at completion of projects.
- Maintain professional credentials through continuing education and research.

3. Senior Consultants

- May serve as project manager for smaller projects.
- Conduct acoustical analysis as directed by PM.
- Prepare reports, analysis, specifications and details in accordance with office standards and precedents.
- Construct computer models for larger scale analysis.
- Participate in continuing education sessions to maintain currency in the field.
- Review work in progress with PM and Senior Principal prior to submission for external review.

4.2.4 Subcontractors

Proposer must clearly identify any subcontractors that may be utilized during the term of this contract.

Martin Gold, FAIA, Assistant Professor, University of Florida, School of Architecture

Jeffrey E. Huber, Associate Professor, Florida Atlantic University, School of Architecture

4.2.5 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.

- 1. Describe your approach in developing the City-wide noise contours and noise standards for zones.***
 - a. Detail on how to complete the tasks and timeline for completion***
- 2. Project Schedule: The Proposer shall also propose a scheduling methodology (timeline) for effectively managing and executing the work in the optimum time. identify project phasing schedules, major project milestones, and key dates in the project schedule. 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 specification.***

Siebein Associates, Inc. in partnership with the University of Florida and Florida Atlantic University, (Soundscape Team) proposes to conduct a soundscape study in response to RFP # 12655-225 for the City of Fort Lauderdale. The Soundscape Team will identify noise related issues in the City, analyze noise and sound in a range of characteristic urban areas, and will propose strategies to reduce, buffer or mitigate unwanted sounds, preserve and enhance desired sounds, and strategically insert new sounds to create a vibrant, urbane environment in the City as well as toward adopting standards for measuring sound, qualifying sound, and for detecting and enforcing violations of reasonable maximum permissible sound limits. The great diversity of urban and suburban communities within the City of Fort Lauderdale suggests a carefully planned strategic approach is needed to identify the priority representative urban conditions that can be utilized to set standard for the larger City of Fort Lauderdale. Working with the City, we will develop a prioritization of those areas and a phased approach for the measurement, analysis, and subsequent noise control strategies. We propose, over the course of approximately 365 to 480 days, to work with civic leaders, municipal staff, and community stakeholders to identify these critical areas, prioritize those areas for specific types of

study, and conduct a pilot study in one representative area. The pilot study will be use to assess the methodology, evaluate the results, make necessary refinements, and then initiate a broader set of studies in multiple priority areas simultaneously. These priority areas, would be selected in collaboration with staff and stakeholders as part of the study process to include the range of neighborhoods and urban contexts throughout the City of Fort Lauderdale. The noise control strategies developed in these representative areas can then be applied as needed to similar circumstances throughout the city from the index of mitigation strategies that will be developed in this project.

The following sections outline how this strategic approach meets the requirements set forth in the RFP.

<u>Item</u>	<u>Description</u>	<u>Responsible Party</u>	<u>Duration</u>
1	<p>Advance Preparation</p> <ul style="list-style-type: none"> <input type="checkbox"/> City to appoint planning staff as point person to liaise with the Soundscape Team. <input type="checkbox"/> City to advertise and develop a committee of citizens to represent the different stakeholder groups, neighborhoods and districts that want to participate in the process. This group will be instrumental in establishing the range of contexts to be studied, the priority locations, and the location of the initial pilot study. 	City of Fort Lauderdale	TBD
2	<p>Initial meeting and orientation</p> <ul style="list-style-type: none"> <input type="checkbox"/> Consultants to meet with planning staff and stakeholder groups collectively and individually to help define the specifics of the study <ul style="list-style-type: none"> - Initial virtual meetings to set the stage for the visit to Fort Lauderdale - In person meetings at venues selected by City with the planning staff, the entire group of stakeholders and with each group of stakeholders <ul style="list-style-type: none"> o Identify areas of concern o Discuss history of events and issues leading up to the RFP o Identify recent events of concern to each group o Brainstorm ideas for potential resolution 	Consultants	Weeks 1-3
3	<p>Stakeholder Meetings and Site Visits. A 2-day visit/workshop with Soundscape Team Leaders</p> <ul style="list-style-type: none"> <input type="checkbox"/> Tour city with planning staff. Meet stakeholders on their own “turf” to see and walk the areas of concern. Initial 	Soundscape Team Leaders	Weeks 4-6

<u>Item</u>	<u>Description</u>	<u>Responsible Party</u>	<u>Duration</u>
	<p>documentation of sound levels during soundwalks before and after these meetings.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Prioritize acoustical zones in Fort Lauderdale that are of concern for the study. Architecture, urban design, occupancy, land use, sound levels, sound sources – inside, outside, types and levels. <ul style="list-style-type: none"> - Review with City and stakeholders. <input type="checkbox"/> Identify one high priority zone for a pilot acoustical modeling, measurement, analysis, and development of initial strategies for monitoring and enforcement. <ul style="list-style-type: none"> - Experience and document existing sonic conditions during several times: Quiet time, Busy time and time when events of concern to stakeholders occur - Identify future sonic conditions based on the existing comprehensive plan and any projected major projects or trends identified by City staff and stakeholders - Soundscape Team will report on the findings from this meeting and set the agenda for the next phase of the study. <p><u>Deliverables:</u> Summary of meeting outcomes with City staff and stakeholders; maps and images locating and qualifying priority study areas; rationale for determining and prioritizing study areas.</p>		
4	<p>Conduct the Pilot Study.</p> <p>Staff from Siebein Acoustic and faculty from the University of Florida and Florida Atlantic University will conduct a pilot study to establish core priorities, evaluate the complexity of the urban context, and develop a refined methodology for expanding the study to other areas of Fort Lauderdale.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Measure and qualify baseline ambient sonic conditions. <input type="checkbox"/> Identify sounds of concern to stakeholders, time of concern, and their impressions of possible solutions. <input type="checkbox"/> Review findings with planners and stakeholders. <input type="checkbox"/> Reconsider and refine the priority areas for the next phase of study – range of areas with noise concerns. <input type="checkbox"/> Follow-up field visit for measurements and meeting with city planners. <input type="checkbox"/> The Soundscape Team will report on the findings from the pilot study and revise the methodology for studying the next group of priority areas. 	Soundscape Team Leaders and Measurement Team	Weeks 7-11

<u>Item</u>	<u>Description</u>	<u>Responsible Party</u>	<u>Duration</u>
	<p><u>Deliverables:</u> soundscape/use mappings of the pilot study area; initial diagrams for improved layering of uses for noise mitigation; initial strategies for elements that might be implemented through design; revised/refined priority study areas map; initial strategies for ongoing measurement and monitoring; strategies for standards/limits within a complex soundscape; and initial strategies for enforcement.</p>		
5	<p>Conduct the Priority Areas Study. Soundscape Team leaders and measurement teams will conduct two field studies during this phase.</p> <p>Field studies will be led by staff from Siebein Associates, Inc. and faculty from the University of Florida and Florida Atlantic University. Siebein staff are highly skilled and experienced in all aspects of acoustical measurement, modeling and design. The faculty leaders have expertise in acoustics and urban design working with communities and developers toward increased urban density and strategies to resolve or mitigate conflicts that can arise within multi-use zoning. Working with teams of Siebein staff, UF and FAU faculty and graduate students, field studies will be conducted including measurements, visits with stakeholders, sound walks, and inventories of the buildings and uses in study areas. Utilizing the information from the field studies, the Unified Land Development code, and precedent projects from other urban areas, students will develop response scenarios that illustrate the integration of noise control and sonic enhancement strategies that could be applied at the neighborhood, street, and building scale. These strategies would be supplemental to noise mitigation through maximum noise limits and enforcement.</p> <p>Inventory buildings in each zone using GIS database and field observations to identify categories of building construction types, sizes and occupancies.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Measure and qualify baseline ambient sonic conditions – with focus on key issues identified in the pilot study. <input type="checkbox"/> Construct and analyze models of the priority areas identified. <input type="checkbox"/> Document acoustical conditions in each zone <input type="checkbox"/> Conduct sound walks with stakeholders, residents, planners, and the Soundscape Team. 	Soundscape Team Leaders and Measurements Teams	Weeks 12-30

<u>Item</u>	<u>Description</u>	<u>Responsible Party</u>	<u>Duration</u>
	<ul style="list-style-type: none"> <li data-bbox="282 331 1073 401">☐ Identify sounds of concern to stakeholders, time of concern, and their impressions of possible solutions. <li data-bbox="282 405 927 436">☐ Review findings with planners and stakeholders. <li data-bbox="282 441 1073 856">☐ Soundscape Team to return to the office/studio for data analysis, scheming, and developing initial concepts and strategies for noise measurement, modeling, monitoring, and enforcement. Additionally sound reduction, buffering, mitigating and enhancing strategies will be provided with several alternative possible solutions to reduce, buffer and mitigate unwanted sounds; preserve, enhance and contain desired sounds; and strategic insertion of new sounds and activities to enliven the fabric of the City, enhance the comprehensive plan; and provide new opportunities for an invigorating urbane living experience for all citizens in a complex, vital, mixed-use urban fabric. <li data-bbox="282 861 1073 1703">☐ The team will consider the full palette of acoustical design and control strategies including reducing, buffering or mitigating sounds at or near their source; improving the building structures to contain sounds and to reduce sounds entering them through careful design and construction; operational controls such as the use of sound level monitoring at critical sound sources such as clubs and entertainment establishments and at critical receiving locations such as the nearest homes to lively areas; and operational controls including noise ordinance requirements, hours of operation, zoning requirements for buffering and construction and other features. This approach is essential so that no one strategy or use group bears the complete acoustical burden of controlling sounds in the city. The compatibility of seemingly disparate adjacencies and occupancies can be enhanced by spreading the acoustical responsibility for planning, design, construction and operation of homes, businesses and industries across all groups rather than staking out a dividing line between each group for defending in place. In this way the interdependency of the residents on the commercial and entertainment groups and vice versa can be explored and sonic transitions between each zone or area be developed so that the goals for each group can be met. <li data-bbox="282 1707 1073 1801">☐ Follow-up field visit for additional measurements, discussions of initial strategies with city planning staff and stakeholders. <li data-bbox="282 1806 1073 1877">☐ The Soundscape Team will report on the findings from these priority area studies toward initial noise abatement, 		

<u>Item</u>	<u>Description</u>	<u>Responsible Party</u>	<u>Duration</u>
	<p>sonic compatibility interventions, monitoring, and enforcement strategies. In this phase, specific strategies will emerge targeted to be appropriate for the varied areas of study.</p> <p><u>Deliverables:</u> soundscape/use mappings of priority areas; illustrations of streetscapes that can reduce noise through design, material choices and integration with other urban infrastructure (stormwater mitigation, parking, durability); diagrams of improved layering of uses for noise mitigation; conceptual strategies for noise mitigation through building design that could be implemented through the Unified Land Development code as appropriate within the existing land use designations.</p>		
6	<p>Acoustical Analysis and Review of Noise Ordinance</p> <p>The current noise ordinance will provide base line information for our pilot and multiple area studies as part of the ongoing research and evaluation. At this point, findings from the studies will be evaluated against the existing ordinance to develop revisions, affirmations, and potential new criteria that would be vetted for inclusion in the ordinances.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Accounting for ambient sound levels in each zone or district <input type="checkbox"/> Acoustical metrics to be considered including dBA, dBC or more detailed octave band or time-weighted metrics. <input type="checkbox"/> Identify allowable sound levels for each zone or district based on current ambient conditions and future projections of sound types and levels from noise models. Similar methods have been employed by the team to recommend sound level limits in other emerging and reinvigorating urban areas, <input type="checkbox"/> Review with the City and stakeholders <input type="checkbox"/> Provide recommendations to the City Attorney for technical acoustical language to be adjusted or added to the noise ordinance to address the concerns of the City of Fort Lauderdale and stakeholders. <input type="checkbox"/> Review with the City and stakeholders. <p>The important point in this proposal is that the enforcement of provisions in a community noise ordinance is only one of the strategies to enhance sonic compatibility among the participants in the community soundscape. The holistically conceived and</p>	Consultants	Weeks 1-41

<u>Item</u>	<u>Description</u>	<u>Responsible Party</u>	<u>Duration</u>
	<p>scientifically executed sonic planning, design, construction and operation of residences, commercial and entertainment establishments and industrial operations will ease the need for stringent noise ordinance requirements since the ordinance is only one of the soundscape control strategies to be implemented in the city. The layering of sonic attributes in the planning, buffering, measuring, modeling and simulating existing and new environments in the future will allow a multi-tiered approach to maintain sonic compatibility among diverse uses and occupancies. It is important to note that the diverse composition of uses and occupancies in a complex urban environment is what makes the City of Fort Lauderdale so exciting and unique as a place to live, work, play, vacation, shop and enjoy.</p> <p><u>Deliverables:</u> Narrative recommendations for any revisions of sonic measurement (process), sound qualification (measurement type), monitoring (ongoing with sensors), and enforcement within the context of the City of Fort Lauderdale Code of Ordinances.</p>		
7	<p>Acoustical Analysis and Recommendations for Soundproofing</p> <ul style="list-style-type: none"> <input type="checkbox"/> Update the inventory of buildings in each zone using any additional information and results of the field observations to refine the categories of building construction types, sizes and occupancies. <input type="checkbox"/> Qualify and define noise sources of concern that require soundproofing to reduce noise. These may be specific to single priority areas or may apply to multiple areas. The abatement strategies will also be qualified as appropriate for each of the areas. <input type="checkbox"/> Where possible, these areas will be keyed to the land use designations of the Unified Land Development code of the City of Fort Lauderdale. <input type="checkbox"/> Provide recommendations for soundproofing to each category of building identified. This will likely be in the form of acoustical improvements for existing facilities to reduce unwanted sounds from propagating out of potential sound source occupancies; to reduce intrusion of exterior sounds entering buildings where this is not desired; and designing new buildings with either or both of these 	Consultants	Weeks 31-41

<u>Item</u>	<u>Description</u>	<u>Responsible Party</u>	<u>Duration</u>
	<p>strategies to be able to fully function given the diverse uses and soundscapes within and near the buildings.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Review recommendations with the City and stakeholders. <input type="checkbox"/> Revise and submit draft recommendations from this phase of the work. <p><u>Deliverables:</u> recommendations and diagrams of strategies to reduce sound transmission in existing buildings and initial language for implementing this within the Land Development Code for new buildings.</p>		
8	<p>Draft Final Comprehensive Report</p> <ul style="list-style-type: none"> <input type="checkbox"/> Review with the City and stakeholders <input type="checkbox"/> Revise and submit final report <p>Deliverables: Executive Summary of the process, findings, and key recommendations detailed in the final report. A final report documenting the study process and steps; rationale for the study area strategy and selection; stakeholder participation; existing, and new building noise mitigation recommendations; and language for municipal code revisions.</p>	Consultants	Weeks 42-54

Also provide information on your firm's current workload and how this project will fit into your workload.

Please see current workload below.

Name of Current / Projected Project	Current Status of Project	% Complete
701 E Whiting	DD	20
Booker High School VPA Theater	CA	80
Daytona Beach Heineman Pumping Station	CD	60
Estates at Acqualina	CD	60
JEA HQ Build Out	DD	20
Jesuit High School Fine Arts Building	CD	60
Martin Theater Restoration/Renovation	SD	20
Meow Wolf	DD	20
Michigan DNR Allegan Shooting Range	CD	60
Moffitt Magnolia Campus CUP	CD	60
Moffitt McKinley Campus Expansion	CA	80
OCPS Howard Middle School	SD	10
OCPS Site 50 High School	DD	20
One Ashley Hotel and Condominium	DD	20
One West Palm	CA	80
Parc Place	DD	20
Ringling College Greensboro Hall	CA	80
Ritz Carlton Residences	CD	60
Sheriff's Office Training Center	DD	20
Spokane Police Department Firing Range	CD	60
The Plaza Coral Gables	CD	60
The Villages Charter High School and Athletic Arena	CA	80
The Villages K-8 School	DD	20
Tyrone Middle School CIDL Building	CA	80
UF Data Science and Information Technology Building	CD	60
UF Peabody Hall	CA	80
Westin Cocoa Beach	CD	60

Describe available facilities, technological capabilities, and other available resources you offer for the project.

Please refer to the Firm Introduction section of the Executive Summary, pages 3-10.

In addition, we have highly sophisticated state-of-the-art equipment including:

- 12 computers dedicated to acoustic software including:
 - CadnaA for studying exterior sound propagation in large urban areas
 - CadnaB for calculating sound propagation from the exterior to the interior and from the interior to the exterior of buildings
 - CadnaR, Odeon, EASE and CATT Acoustic for calculating sounds propagating from loudspeakers and for sounds reflecting off surfaces inside and outside buildings; and
 - EASE for enhanced acoustic simulation
- 14 - Type 1 sound level meters with state-of-the-art software capable of recording acoustical data and .wav file recording and data analysis. The meters can be handheld, mounted on tripods or encased and secured to outdoor surfaces for long term sound level measurements.
- 5 software systems to measure reflected and reverberant sound levels in exterior spaces and inside buildings. The systems will also measure sound reduction through floors, ceilings and walls.
- 2 - 8-channel high speed digital data acquisition systems and measurement microphones to record high level and normal ranges of sounds at very high sampling rates so that data are acquired and analyzed with fine degrees of detail when needed.
- 1 binaural mannequin for measuring and recording sounds on a simulated torso of a human being to measure sounds the way people hear them.

The Soundscape Team also has the equipment and skills to present computer-based sound event simulations or auralizations in a scientifically calibrated playback to stakeholders either on site or in another location in Fort Lauderdale where people can listen to simulated sounds from a new activity or a mitigation option while they live in their homes, walk their dogs, eat in a café or participate in any other of their daily activities. In this way they can provide feedback and evaluate the advantages and disadvantages of alternative design proposals for a specific locale and feel a part of the planning, design and construction process. This type of simulated sonic experience can also be played to a larger group of people in an auditorium, for example, to involve citizens in the planning and regulatory process before concrete decisions are actually made. It also presents very detailed scientific analysis such as decibel readings, computer analysis, charts and graphs in a qualitative, experiential way that normal citizens can appreciate and understand. This work can be done as an Additional Service if desired.

3. ***Project Budget: Please provide a project budget, which would include the overall budget for the project and the itemized budget for each task, as outlined in this RFP. Include the level of effort for each staff person and billing rates for each person. Identify loaded hourly rates that include all costs, including incidental costs, such as travel, gas, per diem, lodging, etc.***

Please see Section VI – Cost Proposal beginning on page 53.

4.2.6 References

Provide at least three references, preferably government agencies, for projects with similar scope as listed in this RFP completed within the previous five years. Information should include:

- ***Client Name, address, contact person telephone and current E-mail addresses.***
- ***Description of work.***
- ***Year the project was completed.***
- ***Total cost of the project, estimated and actual.***

Include a brief description of the projects associated with the reference, and the role of the respective team member. Identify the key project manager and designated staff members that were associated with the specific project.

Lori Burford
MDNR Shooting Range and Facilities Specialist
Roscommon Customer Service Center
8717 N. Roscommon Road
Roscommon, MI 48653
989-600-9114
BurfordL@michigan.gov

Project: Michigan Department of Natural Resources Statewide Outdoor Shooting Ranges Sound Studies

Description of Work: The Michigan Department of Natural Resources proposed to develop several primitive ranges or open sites throughout the state into outdoor shooting ranges. We worked closely with the Department to conduct acoustical studies to select sites compatible with surroundings. Our consultants conduct live fire acoustical measurements with multiple shooters using several types of firearms and ammunition. We record data up to two miles from the proposed range sites. We perform data analysis using our proprietary software and develop 3D models including noise contour mapping of firearms discharge for each proposed range. We develop noise mitigation recommendations and acoustical design strategies for each range with alternate configurations, noise mitigation features and weather conditions to optimize the acoustical design of each range and to meet noise ordinance sound limits.

Year Completed: Ongoing

Cost of Project: Unknown

Team Members and Roles:

Gary W. Siebein: Principal in Charge
Director of Acoustical Design and Analysis; Overall Project Direction, Quality Control Review of Work, Client Relations

Keely Siebein: Associate Principal Consultant
Acoustical Design and Analysis, Soundscape Design, Stakeholder Meetings

Gary Siebein, Jr.: Senior Acoustical Consultant
Environmental Noise Measurement, Project Data Analysis and Field Measurements

Marylin Roa: Senior Acoustical Consultant
Project Manager, Lead Acoustical Designer, 3D Acoustic Computer Modeling, Interior Room Acoustic and Finish System Design

Jennifer Russell: Senior Acoustical Consultant
HVAC System Noise and Vibration Control Design, Architectural Acoustic Design, Sound Isolation System Design, Acoustical Finish Systems, Soundscape Analysis and Acoustical Measurement

Matthew Vetterick: Senior Acoustical Consultant
HVAC System Noise and Vibration Control Design and Sound Isolation System Design, Architectural Acoustic Design, Computer Modeling

Mr. Chris Cianfaglione, PLA., ISA, CA, Certified Arborist
Kimley-Horn and Associates, Inc.
1777 Main Street, Suite 200
Sarasota, FL 34236
941-379-7627
Chris.Cianfaglione@kimley-horn.com

Project: Marie Selby Botanical Gardens Soundscape Study and Noise Ordinance Review

Description of Work: In an effort to grow the walkable garden space and to protect the scientific collection from future sea level rise, the institution planned a \$92 million expansion plant research building, a solar-powered rooftop restaurant and a recreational trail. The expansion plan was designed to increase garden space by 50% within the existing footprint and to add more public park space. The gardens are surrounded by residential and mixed-use properties. Residents were concerned about the increased level of noise that would be generated by the new buildings and increased traffic. Siebein Acoustic conducted extensive site noise studies at multiple locations within the park, reviewed City noise ordinances, performed sophisticated acoustical analysis, developed noise contour mapping and constructed 3D computer models of the proposed buildings and soundscapes. We provided acoustical design recommendations for noise mitigation of the existing and proposed designs to keep noise levels within City Noise Ordinance levels. We attended multiple Plan Board Meetings presenting our findings and our acoustical recommendations to Board Members, City Staff, attorneys and residents.

Year Completed: 2021

Cost of Project: \$92M

Team Members and Roles:

Gary W. Siebein:	Principal in Charge Director of Acoustical Design and Analysis; Overall Project Direction, Quality Control Review of Work, Client Relations
Keely Siebein:	Senior Consultant Acoustical Design and Analysis, Soundscape Design, Stakeholder Meetings
Gary Siebein, Jr.:	Acoustical Consultant AV Systems Design, Environmental Noise Measurement, Project Data Analysis and Field Measurements
Marylin Roa:	Senior Acoustical Consultant Project Manager, Lead Acoustical Designer, 3D Acoustic Computer Modeling, Interior Room Acoustic and Finish System Design
Jennifer Russell:	Acoustical Consultant HVAC System Noise and Vibration Control Design, Architectural Acoustic Design, Sound Isolation System Design, Acoustical Finish Systems, Soundscape Analysis and Acoustical Measurement
Matthew Vetterick:	Acoustical Consultant HVAC System Noise and Vibration Control Design and Sound Isolation System Design, Architectural Acoustic Design, Computer Modeling

Charles D. (Dan) Bailey, Jr.
Attorney at Law
Williams Parker
(941) 329-6609
dbailey@williamsparker.com

Project: Sarasota Memorial Hospital Chiller Plant Full Scale Simulation, Sarasota, FL

Description of Work: Siebein Acoustic conducted a series of workshops in concert with the Architect, Engineers, Hospital Staff and Residents while simultaneously undertaking a large scale Environmental Acoustical Assessment (EAA) of the existing ambient sound conditions in the neighborhood. The EAA consisted of taking short term acoustical measurements of ambient sound levels at more than 20 locations spanning a 14 block area in and around the Hospital, long term measurements of ambient sounds at four key receptor locations, recording high resolution ambient sounds in the neighborhood, and recordings of cooling tower sounds at a similar energy plant at a hospital in Charlotte, North Carolina. The potential noise impacts of several alternative design options and noise mitigation strategies for the cooling towers were modeled. A presentation to the residents that included estimated cooling tower sounds in the presence of ambient neighborhood sounds played through loudspeakers in an auditorium was well received. This presentation led to requests for a “real life” demonstration in the neighborhood, as well as demands for even lower noise levels. Custom noise mitigation solutions for the cooling towers and other equipment were developed and the results were presented to the neighborhood in the form of actual cooling tower sounds

broadcast through 16 loudspeakers located at the top of the a parking garage adjacent to the future site of the Plant, at the levels they would actually be heard (or not heard) in the neighborhood. This allowed residents to walk around their neighborhood all day and night over a four day period as ambient sounds changed, and listen for noise impacts from the simulated Plant. This type of “soundscape” method allowed the evaluation of the “net zero” noise impacts to occur by residents. The soundscape workshops served as a vehicle to develop productive relationships between the hospital, design team, city and neighbors. Convinced that the resulting cooling tower sounds, or lack thereof, were acceptable, the residents and the City of Sarasota gave their approval and the project was able to move forward with the design and construction of the Plant at the preferred site. Siebein Acoustic designed a large central energy plant for a growing hospital to meet extremely low noise emission requirements so there would be a “net zero” noise impact on nearby residential communities. State-of-the-art noise control systems for cooling towers, emergency generators and other large equipment were designed and specified for the project. A computer model was developed using sound source acoustical data for the CEP equipment. The effect of distance, topography, and vegetation were included in the computer model to arrive at estimated sound levels in the community due to the CEP and to develop preliminary noise mitigation strategies to meet several alternative design criteria.

Year Completed: 2010

Cost of Project: Estimated \$63M

Team Members and Roles:

Gary W. Siebein:	Principal in Charge Director of Acoustical Design and Analysis; Overall Project Direction, Quality Control Review of Work, Client Relations
Keely Siebein:	Acoustical Consultant Acoustical Design and Analysis, Soundscape Design, Stakeholder Meetings
Gary Siebein, Jr.:	Acoustical Consultant Environmental Noise Measurement, Project Data Analysis and Field Measurements

Charles D. (Dan) Bailey, Jr.
Attorney at Law
Williams Parker
(941) 329-6609
dbailey@williamsparker.com

Project: Ringling College of Art + Design Chiller Plant Full Scale Simulation, Sarasota, FL

Description of Work: Siebein Acoustic provided comprehensive acoustical design services for the new Central Energy Plant at Ringling College. We conducted a noise study to determine noise mitigation features required to meet the sound level limits of the City of Sarasota Noise Ordinance at surrounding properties. We conducted acoustical analysis of the proposed chiller plant and provided noise mitigation system design. We also conducted substantial completion acoustical measurements of the new Central Energy Plant. Siebein Acoustic conducted a full-scale sound simulation

experiment by recording sounds of a Central Energy Plant similar in size. We designed the sound system to replicate the noise contours that would exist for Ringling's completed CEP and placed the speakers in clusters of 5 to simulate the large area source of sound that the CEP would produce. The clusters were zoned so that the resulting sound contours produced would be within 1 to 2 decibels of the sounds modeled for the CEP at locations in the areas surrounding the plant. Three soundwalks were conducted with Stakeholders to listen to the simulated sounds, enabling them to experience the effects of the various chiller plant designs in a way that was more helpful than seeing noise contours on a site plan. Additionally, the Client understood that low-frequency sounds would likely affect individuals living in the residences directly adjacent to the chiller plant. With our noise mitigation recommendations implemented, the completed Central Energy Plant operating at full capacity produced a maximum dBA of 49, well below the 75 dBA allowed by the City of Sarasota Noise Ordinance.

Year Completed: 2019

Cost of Project: Unknown

Team Members and Roles:

Gary W. Siebein:	Principal in Charge Director of Acoustical Design and Analysis; Overall Project Direction, Quality Control Review of Work, Client Relations
Keely Siebein:	Senior Consultant Acoustical Design and Analysis, Soundscape Design, Stakeholder Meetings
Gary Siebein, Jr.:	Acoustical Consultant AV Systems Design, Environmental Noise Measurement, Project Data Analysis and Field Measurements
Marylin Roa:	Acoustical Consultant Lead Acoustical Designer, 3D Acoustic Computer Modeling, Interior Room Acoustic and Finish System Design
Jennifer Russell:	Acoustical Consultant HVAC System Noise and Vibration Control Design, Architectural Acoustic Design, Sound Isolation System Design, Acoustical Finish Systems, Soundscape Analysis and Acoustical Measurement
Matthew Vetterick:	Acoustical Consultant HVAC System Noise and Vibration Control Design and Sound Isolation System Design, Architectural Acoustic Design, Computer Modeling

Gary Mark, Director of Design
The Villages
3619 Kiessel Road
The Villages, Florida
352-753-6262
Gary.Mark@thevillages.com

Project: The Villages Florida Turnpike Planning Soundscape Analysis and Noise Mitigation

Description of Work: The Villages acquired an additional 10,000 acres with initial plans to build approximately 4,500 homes and commercial developments. With walking trails and golf cart trails running alongside busy highways and some of the homesites fairly close to the roadways, the developer sought Siebein Acoustic's expertise in soundscape planning to conceptualize strategies to buffer traffic noise from the homes, recreational facilities and their amenities. Siebein Acoustic conducted extensive site noise studies and acoustical measurements over several miles of roadways that run through the development site. We performed extensive acoustical analysis, developed noise contour mapping and constructed 3D computer models of the soundscapes of the development. We attended multiple planning meetings and provided acoustical design recommendations for noise mitigation including natural berms and sound walls to buffer and mitigate the sounds of traffic noise and planning the trails and walkways to maximize the existing environment as a natural buffer. The natural contours of the site, topography of golf courses, amenities and buffers, and strategic conservation area planning are all considered in the soundscape analysis.

Year Completed: 2021

Cost of Project: Estimated \$84M

Team Members and Roles:

Gary W. Siebein:	Principal in Charge Director of Acoustical Design and Analysis; Overall Project Direction, Quality Control Review of Work, Client Relations
Gary Siebein, Jr.:	Senior Acoustical Consultant AV Systems Design, Environmental Noise Measurement, Project Data Analysis and Field Measurements
Marylin Roa:	Senior Acoustical Consultant Project Manager, Lead Acoustical Designer, 3D Acoustic Computer Modeling, Interior Room Acoustic and Finish System Design
Jennifer Russell:	Senior Acoustical Consultant HVAC System Noise and Vibration Control Design, Architectural Acoustic Design, Sound Isolation System Design, Acoustical Finish Systems, Soundscape Analysis and Acoustical Measurement

4.2.7 Minority/Women (M/WBE / DBE) 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.

Siebein Associates, Inc. is certified by the State of Florida Department of Management Services, Office of Supplier Diversity as a Woman Owned Business. Please see our certificate below.



4.2.8 Required Forms

A. Proposal Certification

Complete and attach the Proposal Certification provided herein.

Siebein Associates, Inc. completed and submitted the Proposal Certification form on BidSync as instructed.

B. Cost Proposal

Provide firm, fixed, costs for all services/products using the form 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.

Please see Section VI Cost Proposal beginning on page 53.

C. Non-Collusion Statement

This form is to be completed, if applicable, and inserted in this section.

Siebein Associates, Inc. completed and submitted this form on BidSync as instructed.

D. Non-Discrimination Certification Form

This form is to be completed and inserted in this section.

Siebein Associates, Inc. completed and submitted the Non-Collusion Statement form on BidSync as instructed.

E. Local Business Preference (LBP)

This form is to be completed, if applicable, and inserted in this section.

Not Applicable. Siebein Associates, Inc. is located in Gainesville, Florida in Alachua County.

F. Disadvantaged Business Enterprise Preference (DBEP)

This form is to be completed, if applicable, and inserted in this section.

Not Applicable. Siebein Associates, Inc. is not a DBEP.

G. Contract Payment Method

This form must be completed and returned with your proposal. Proposers must presently have the ability to accept these credit cards or take whatever steps necessary to implement acceptance of a card before the start of the contract term, or contract award by the City.

Siebein Associates, Inc. completed and submitted the Contract Payment Method form on BidSync as instructed.

H. E-Verify Affirmation Statement

This form must be completed and returned with your proposal.

Siebein Associates, Inc. is exempt from eVerify. Please see Private Employer Affidavit below.
We submitted an Exception via BidSync as instructed.

Private Employer Affidavit Pursuant To O.C.G.A. § 36-60-6(d)

By executing this affidavit under oath, the undersigned private employer verifies one of the following with respect to its application for a business license, occupational tax certificate, or other document required to operate a business as referenced in O.C.G.A. § 36-60-6(d):

Section 1. Please check only one:

(A) _____ On January 1st of the below-signed year, the individual, firm, or corporation employed more than ten (10) employees¹.

*** If you select Section 1(A), please fill out Section 2 and then execute below.

(B) On January 1st of the below-signed year, the individual, firm, or corporation employed ten (10) or fewer employees.

*** If you select Section 1(B), please skip Section 2 and execute below.

Section 2.

The employer has registered with and utilizes the federal work authorization program in accordance with the applicable provisions and deadlines established in O.C.G.A. § 36-60-6. The undersigned private employer also attests that its federal work authorization user identification number and date of authorization are as follows:

Name of Private Employer

Federal Work Authorization User Identification Number

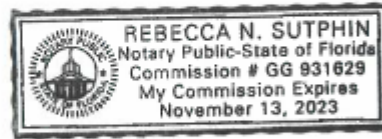
Date of Authorization

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on April, 25, 2022 in Graineville (city), FL (state).

[Signature]
Signature of Authorized Officer or Agent

Tita A Siebert, President
Printed Name and Title of Authorized Officer or Agent



SUBSCRIBED AND SWORN BEFORE ME
ON THIS THE 25th DAY OF April, 2022

[Signature]
NOTARY PUBLIC

My Commission Expires: November 13, 2023

¹To determine the number of employees for purposes of this affidavit, a business must count its total number of employees company-wide, regardless of the city, state, or country in which they are based, working at least 35 hours a week.

I. 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.

Please see our Certificate of Insurance on next page.



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
11/10/2021

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

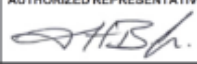
PRODUCER The Hilb Group of Florida, LLC - Tampa 28100 U.S. Highway 19 N Suite 201 Clearwater FL 33761-2656	CONTACT NAME: A&E Service Team PHONE (A/C, No, Ext): 813-865-1195 E-MAIL ADDRESS: jtravis@hilbgroup.com	FAX (A/C, No): 813-636-4000
	INSURER(S) AFFORDING COVERAGE	
INSURED Siebein Associates, Inc. 625 NW 60th Street, Suite C Gainesville FL 32607	SIL-BASS-01	INSURER A: Travelers Casualty and Surety Company NAIC #: 19038
		INSURER B: Phoenix Insurance Company (The) NAIC #: 25623
		INSURER C: Travelers Property Casualty Company of America NAIC #: 25674
		INSURER D: Liberty Insurance Underwriters, Inc. NAIC #: 19917
		INSURER E: INSURER F:

COVERAGES CERTIFICATE NUMBER: 1855401447 REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSD WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
C	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:		680-1H797472-21-47	8/30/2021	8/30/2022	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMPROP AGG	\$ 2,000,000 \$ 1,000,000 \$ 5,000 \$ 2,000,000 \$ 4,000,000 \$ 4,000,000 \$
B	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY		BA-8P19716A	8/30/2021	8/30/2022	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	\$ 1,000,000 \$ \$ \$
C	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input checked="" type="checkbox"/> RETENTION \$ 10,000		CUP-0F634657	8/30/2021	8/30/2022	EACH OCCURRENCE AGGREGATE	\$ 2,000,000 \$ 2,000,000 \$
A	<input checked="" type="checkbox"/> WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N <input type="checkbox"/> Y <input checked="" type="checkbox"/> N/A	UB-6K083466	6/11/2021	6/11/2022	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTHER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE C.L. DISEASE - POLICY LIMIT	\$ 1,000,000 \$ 1,000,000 \$ 1,000,000
D	Professional Liability		AEX101719-0006	12/3/2021	12/3/2022	2,000,000 Each Claim	2,000,000 Ann Agg

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
Professional Liability is written on a claims made and report basis.

CERTIFICATE HOLDER For Proposal Purposes ***** ***** USA	CANCELLATION SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE 
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J. W-9 for Proposing Firm

This form must be completed and returned with your proposal.

Please see W9 on next page.

Request for Taxpayer Identification Number and Certification

**Give Form to the
requester. Do not
send to the IRS.**

▶ Go to www.irs.gov/FormW9 for instructions and the latest information.

Print or type. See Specific Instructions on page 3.	<p>1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank. Siebein Associates, Inc.</p> <p>2 Business name/disregarded entity name, if different from above</p> <p>3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only one of the following seven boxes.</p> <p><input type="checkbox"/> Individual/sole proprietor or single-member LLC</p> <p><input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____</p> <p><input type="checkbox"/> Other (see instructions) ▶ _____</p> <p>4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):</p> <p>Exempt payee code (if any) _____</p> <p>Exemption from FATCA reporting code (if any) _____</p> <p><small>(Applies to accounts maintained outside the U.S.)</small></p>	
	<p>5 Address (number, street, and apt. or suite no.) See instructions. 625 NW 60th Street, Suite C</p> <p>6 City, state, and ZIP code Gainesville, FL 32607</p> <p>7 List account number(s) here (optional)</p>	<p>City of Fort Lauderdale 100 N. Andrews Avenue Fort Lauderdale, FL 33301</p>

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number										
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; height: 20px;"> </td> <td style="width: 25%; height: 20px;"> </td> <td style="width: 25%; height: 20px;"> </td> <td style="width: 25%; height: 20px;"> </td> </tr> </table>										
or										
Employer identification number										
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 12.5%; height: 20px;">5</td> <td style="width: 12.5%; height: 20px;">9</td> <td style="width: 12.5%; height: 20px;">-</td> <td style="width: 12.5%; height: 20px;">3</td> <td style="width: 12.5%; height: 20px;">2</td> <td style="width: 12.5%; height: 20px;">2</td> <td style="width: 12.5%; height: 20px;">6</td> <td style="width: 12.5%; height: 20px;">8</td> <td style="width: 12.5%; height: 20px;">8</td> <td style="width: 12.5%; height: 20px;">2</td> </tr> </table>	5	9	-	3	2	2	6	8	8	2
5	9	-	3	2	2	6	8	8	2	

Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
- I am a U.S. citizen or other U.S. person (defined below); and
- The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here	Signature of U.S. person ▶ <i>Rita A. Siebein</i>	Date ▶ April 6, 2022
------------------	---	-----------------------------

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, later.

K. Active Status Page from Division of Corporations – Sunbiz.org

Provide PDF of current page with your proposal.

Please see our State of Florida Corporation Certificate and Active Status Page from Sunbiz.org on next pages.

State of Florida

Department of State

I certify from the records of this office that SIEBEIN ASSOCIATES, INC. is a corporation organized under the laws of the State of Florida, filed on March 1, 1994.

The document number of this corporation is P94000017610.

I further certify that said corporation has paid all fees due this office through December 31, 2022, that its most recent annual report/uniform business report was filed on January 13, 2022, and that its status is active.

I further certify that said corporation has not filed Articles of Dissolution.

*Given under my hand and the
Great Seal of the State of Florida
at Tallahassee, the Capital, this
the Thirteenth day of January,
2022*



Randy Be
Secretary of State

Tracking Number: 1181802330CC

To authenticate this certificate, visit the following site, enter this number, and then follow the instructions displayed.

<https://services.sunbiz.org/Filings/CertificateOfStatus/CertificateAuthentication>



[Department of State](#) / [Division of Corporations](#) / [Search Records](#) / [Search by Entity Name](#) /

[Previous On List](#) [Next On List](#) [Return to List](#)

siebein

Search

No Events No Name History

Detail by Entity Name

Florida Profit Corporation
SIEBEIN ASSOCIATES, INC.

Filing Information

Document Number	P94000017610
FEI/EIN Number	59-3226882
Date Filed	03/01/1994
State	FL
Status	ACTIVE

Principal Address

625 N.W. 60TH STREET
SUITE C
GAINESVILLE, FL 32607

Changed: 02/18/2011

Mailing Address

625 N.W. 60TH STREET
SUITE C
GAINESVILLE, FL 32607

Changed: 02/18/2011

Registered Agent Name & Address

SIEBEIN, RITA A
625 NW 60TH ST.
STE C
GAINESVILLE, FL 32607

SECTION VI – COST PROPOSAL PAGE

Please see Section VI Cost Proposal on next pages.

SECTION VI - COST PROPOSAL PAGE

Proposer Name: Siebein Associates, Inc.

Proposer agrees to supply the products and services at the prices proposed below in accordance with the terms, conditions and specifications contained in this RFP.

Cost to the City: Contractor shall quote firm, fixed, hr. rates 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.

Provide a breakdown of fee in the below line items.

LABOR CATEGORY)ex. Project Mang, Admin. Assistant. Etc.)	HOURLY LABOR BILLING RATE	ESTIMATED HOURS to complete entire project	AMOUNT (rate x Hr.)
Senior Principal Consultant	\$ 295 -	247	\$ 72,865 -
Associate Principal Consultant	\$ 175 -	470	\$ 82,250 -
Senior Consultant	\$ 135 -	697	\$ 94,095 -
Consultant	\$ 125 -	432	\$ 54,000 -
Subconsultants	\$ -		\$ 67,182 -
Reimbursable Expenses	\$ -		\$ 32,967 -
Visa payment surcharge (if used)	\$ -		\$ 12,101 -
	\$ -		\$ -
	\$ -		\$ -
	\$ -		\$ -
GRAND TOTAL NOT TO EXCEED CONTRACT AMOUNT:			\$ 415,460

If you will be breaking down the scope of services via different Task, provide charts per task indicating the following:


- Identify the task

- The personnel assigned to each tasks, the number of hours assigned per person per task with billable rates and total cost per task
- Total cost of all tasks proposed. NOTE: your Final /Grand Total of all Task Orders must be the same as the total in fee chart above). In the case of a discrepancy in computing the amount of the bid, the price quoted in the Grand Total Not To Exceed Contract Amount in the above chart will govern.

Submitted by:

Gary W. Siebein
Name (printed)

May 3, 2022
Date


Signature

Senior Principal Consultant
Title

FORT LAUDERDALE SOUND STUDY

Fort Lauderdale, Florida

PERSON HOUR AND COST ESTIMATE

Senior Associate Senior
Principal Principal Consultant Consultant SUBTOTALS

Items 1, 2 & 3 Project kick off, Initial Meetings, Orientation, Site Visits, Workshops

Virtual kick off meetings
Travel, 2 Site visits and meetings, draft study plan, literature review

Subtotal hours per item	26	94	0	0	
Hourly rate	\$295	\$175	\$135	\$125	
Estimated cost for personnel	\$7,670	\$16,450	\$0	\$0	\$24,120
Reimbursables					\$2,715
Subtotal cost for phase					\$26,835

Item 4 TASK 2 Pilot Study - Site Visits, Meetings with Stakeholders, Select Area of Study, Soundscape Measurement, Mapping and Modeling

Measure and qualify baseline ambient sonic conditions
Identify areas of concern with City and Stakeholders, review findings with City
Refine priority areas for study and range of acoustic concerns - select pilot study area
Soundwalks, long term measurements, modeling and mapping of pilot study area
Soundscape /computer models for pilot study area, initial strategies for sonic intervention elements, initial strategies for standards, monitoring and enforcement in a complex environment

Subtotal hours per item	51	36	197	123	
Hourly rate	\$295	\$175	\$135	\$125	
Estimated cost for personnel	\$15,045	\$6,300	\$26,595	\$15,375	\$63,315
Reimbursables					\$11,555
Subtotal cost for phase					\$74,870

Item 5 Priority Area Studies Measurement, Soundscape/Noise Contour Mapping, Modeling of Alternatives, Strategies for Sonic Interventions

Inventory buildings using GIS database and field observations, sonic activities, base line ambient sound levels, acoustical issues in each Priority Area
Conduct soundwalks with City staff and stakeholders in each Priority Area, review findings with Team and stakeholders
Construct and analyze computer models of each priority area
Analyze data, develop initial concepts for soundscape compatibility planning, design interventions, noise ordinance development and soundproofing where needed
Analyze potential approaches in computer models at the scale of individual buildings, near by buildings and plazas, etc., the neighborhood and possibly larger scale if needed
Examine potentials for control via monitoring, ordinance requirements, administrative and operational controls in addition to infrastructure controls
Review potential approaches and solutions with stakeholders and city
Prepare report of findings for each priority area and how the approaches and strategies developed in each can possibly be transferred to the larger city environment and other areas

Subtotal hours per item	111	108	464	165	
Hourly rate	\$295	\$175	\$135	\$125	
Estimated cost for personnel	\$32,745	\$18,900	\$62,640	\$20,625	\$134,910
Reimbursables					\$16,140
Subtotal cost for phase					\$151,050

Senior Associate Senior
Principal Principal Consultant Consultant SUBTOTALS

Item 6 Analysis and Review of Noise Ordinance

Draft ordinance adjustments, Review with City and stakeholders, revise report, Present Final Draft

Subtotal hours per item	12	72	0	0	
Hourly rate	\$295	\$175	\$135	\$125	
Estimated cost for personnel	\$3,540	\$12,600	\$0	\$0	\$16,140
Reimbursables					\$0
Subtotal cost for phase					\$16,140

Principal Principal Consultant Consultant SUBTOTALS

Item 7 Analysis and Recommendations for Soundproofing and Noise Mitigation

Acoustical analysis of typical buildings with recommendations for soundscape compatibility planning, soundproofing and other noise mitigation strategies as needed

Subtotal hours per item	24	80	0	120	
Hourly rate	\$295	\$175	\$135	\$125	
Estimated cost for personnel	\$7,080	\$14,000	\$0	\$15,000	\$36,080
Reimbursables					\$0
Subtotal cost for phase					\$36,080

Item 8 Final Report

Draft report, Review with City and revise report, Public presentation

Subtotal hours per item	23	80	36	24	
Hourly rate	\$295	\$175	\$135	\$125	
Estimated cost for personnel	\$6,785	\$14,000	\$4,860	\$3,000	\$28,645
Reimbursables					\$2,557
Subtotal cost for phase					\$31,202

UF and FAU faculty time and fringes	\$30,507
Computer software licenses - CADNA A and Odeon for students	\$16,802
UF and FAU expenses	\$19,873
Visa expense - this can be deducted if payment is made by check of EFT and adjusted if actual cost is less	\$12,101

Subtotal personnel costs	\$333,717
Subtotal expenses	\$81,743
TOTAL DESIGN FEES AND REIMBURSABLES	\$415,460

Signed Addenda

Please see signed addenda on next pages.

Addendum No. 3 was removed from BidSync on May 3, 2022.



City of Fort Lauderdale • Procurement Services Division
100 N. Andrews Avenue, 619 • Fort Lauderdale, Florida 33301
954-828-5933 Fax 954-828-5576
purchase@fortlauderdale.gov

ADDENDUM NO.3

RFP No. 12655-225

TITLE: Acoustic Consultant to Develop Noise Analysis and Identify Noise
Contours

ISSUED: April 22, 2022

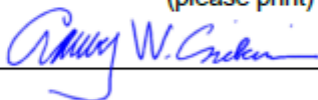
This addendum is being issued to make the following change(s):

1. CLARIFICATION: Item 2.19 – Local Business Preference and 2.20 – Disadvantaged Business Enterprise Preference are not applicable to this solicitation (unless all totals exceed \$100,000).

All other terms, conditions, and specifications remain unchanged.

James Hemphill
Asst. Manager Procurement and Contract

Company Name: Siebein Associates, Inc.
(please print)

Bidder's Signature: 

Date: April 29, 2022

NOTE: This Addendum has been named Addendum #3 due to the fact that BIDSYNC has indicated the two previous due date extensions as Addendums (1 and 2).



City of Fort Lauderdale • Procurement Services Division
100 N. Andrews Avenue, 619 • Fort Lauderdale, Florida 33301
954-828-5933 Fax 954-828-5578
purchase@fortlauderdale.gov

ADDENDUM NO.4

RFP No. 12655-225

TITLE: Acoustic Consultant to Develop Noise Analysis and Identify Noise Contours

ISSUED: April 28, 2022

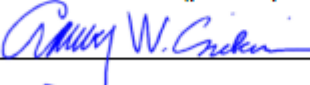
This addendum is being issued to make the following change(s):

1. CORRECTION: All references to Noise Contours are to be disregarded. Noise Contours related services shall not be a requirement for this project.
2. Bid due date has been extended to May 3rd, 2022

All other terms, conditions, and specifications remain unchanged.

James Hemphill
Asst. Manager Procurement and Contract

Company Name: Siebein Associates, Inc.
(please print)

Bidder's Signature: 

Date: May 3, 2022

Additional Information

A. Martin Gold Relevant Publications

- **Goodwill Reconsidered** 2019
Martin Gold and Ravi Srinivasan, ISBN 978-0-578-48419-8, 102 pages
Masterplan alternatives for a new cultural arts center in the
Newtown neighborhood of Sarasota, FL.
- **Agri-Urbanism: A Study of Urban/Sub-Urban Morphology** 2019
Martin Gold and Arash Alborzi, EDRA 50, Sustainable Urban Environments
Brooklyn, New York.
- **Investigating Food Justice Social Sustainability Policy in Urban Agriculture** 2019
Arash Alborzi and Martin Gold EDRA 50, Sustainable Urban Environments
Brooklyn, New York.
- **Agri-Urbanism** 2018
Martin Gold and Mary Padua, ISBN 978-0-578-40061-7, 273 pages
- **Longboat Key – Toward Community, Economy and Resiliency** 2015
Research publication, UF College of Design Construction and Planning
- **Sarasota Heritage Center** 2012
Report and documentation of research and service learning,
Presented to the Sarasota County Commission
- **Planning for the Soundscape of Transportation** 2011
Designing Soundscape for Sustainable Urban Development
Conference Proceedings, Stockholm, Sweden, Spring 2011, pp 42-47
- **Workscape: Creative Culture Office Parks for Gainesville, Fl** 2010
Gainesville Chamber of Commerce, August 2010.
- **Visioning Chipley** 2009
Mississippi State Coastal Research Extension Center
A research report published in August 2009.
- **Designing the Waldo Road Corridor** 2009
Alachua County, City of Gainesville and University of Florida
A research report published in May, 2009.

- **Archer Braid: Bicycle and Pedestrian Commuting and Recreational Corridor** **2007**
 Metropolitan Transportation Planning Authority

- **Sustainable Community Design & Management Strategies for Florida** **2006**
 Gold, Martin and Hostetler, Mark
 Towards a Sustainable Florida, Edited by Dr. Stephen Mulkey,
 School of Natural Resources and Environment, 2006, 36-47

- **Urban Village: Transportation and Planning Strategies for SW 20th Ave.** **2006**
 Design visioning and proposals for a sustainable urban village approach to
 Development at the perimeter of the University of Florida
 Metropolitan Transportation and Planning Organization, 2006.

- **Winning With Rail Trails: Award Winners Suggested Guidelines for Trail
 Planning and Design** **2004**
 Publication of Bicycle Promenade competition proposal
 Steve Luoni and Martin Gold
 Article authors Jim Donovan and Hugh Morris
 Landscape Architecture Magazine, July 2004

- **Transporting Ecologies: Alachua Countywide Bicycle Master Plan Addendum** **2004**
 North Central Florida Regional Planning Council, August 2004.

- **Players Theater** **2001**
 Gary W. Siebein and Martin Gold
 Presented at the 141st meeting of the Acoustical Society of America
 Encyclopedia of Twentieth Century Architecture, Taylor Francis Publishers

- **Ten Ways to Provide a High-Quality Acoustic Environment in Schools** **2000**
 Gary W. Siebein, Martin A. Gold, Glenn W. Siebein and Michael G. Ermann
 Language Speech, and Hearing Services in Schools, Vol. 31, October 2000

- **Listener Perception of Spatial Impression and Auditory Source Width and
 Their Influence on Overall Impression in Real Rooms and Headphone Studies** **1999**
 Proceedings from the 137th Meeting of the Acoustical Society of America

- **Background Noise Levels in Classrooms** **1999**
 Gary W. Siebein, Martin A. Gold, Mitchell Lehde, and John Ashby.
 Proceedings from the 137th Meeting of the Acoustical Society of America

- **Principals of Classroom Acoustics: Reverberation** **1997**
 Gary W. Siebein, Carl C. Crandel and Martin A. Gold
 Educational Audiology Tutorial, Journal of Education Audiology: 5, 32-43

- **Pilot Studies of Speech Communication in Elementary School Classrooms:
Literature Review and Methods** 1997
Phillip Abbott, Carl C. Crandel, Martin A. Gold, M. Joyce Hasell,
Christopher R. Herr, Hee Won Lee, Mitchell Lehde and Gary W. Siebein
Proceedings from Noise-Con 97
- **Designing the Concert Hall of the 21st Century: Historic precedent and
Virtual Reality** 1997
Gary W. Siebein and Martin A. Gold
Proceedings from the 85th Association of Collegiate Schools of Architecture
Annual Meeting and Technology Conference—Architecture: Material and
Imagined

B. Martin Gold Architectural License

 Ron DeSantis, Governor Julie I. Brown, Secretary



STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

BOARD OF ARCHITECTURE & INTERIOR DESIGN

THE ARCHITECT HEREIN IS LICENSED UNDER THE
PROVISIONS OF CHAPTER 481, FLORIDA STATUTES


GOLD, MARTIN A
1924 NW 6TH STREET
GAINESVILLE FL 32609

LICENSE NUMBER: AR93691

EXPIRATION DATE: FEBRUARY 28, 2023

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C. Jeffrey Huber Relevant Publications

- **Low Impact Development: a design manual for urban areas** 2010
Fayetteville: University of Arkansas Press.
- **Visioning Rail Transit in Northwest Arkansas: Lifestyles and Ecologies** 2007
- **Planning Primer: Transit-Oriented Development (TOD)** 2006
- **Monticello: Place-Based Codes and Plans for an Arkansas Delta Community** 2006
- **Habitat Trails: Habitat for Humanity, from infill house to green neighborhood development** 2005
- **Porches** 2005
- **Campus Hydroscapes: Watershed as a Planning Platform for Campus Improvements in the University of Arkansas Athletic Valley** 2005

D. Jeffrey Huber Architectural Licenses

Ron DeSantis, Governor

Julie I. Brown, Secretary

Florida
dbpr

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

BOARD OF LANDSCAPE ARCHITECTURE

THE LANDSCAPE ARCHITECT HEREIN HAS REGISTERED UNDER THE
PROVISIONS OF CHAPTER 481, FLORIDA STATUTES

HUBER, JEFFREY ERWIN
2808 NE 10TH TERRACE
WILTON MANORS FL 33334

LICENSE NUMBER: LA6667547

EXPIRATION DATE: NOVEMBER 30, 2023

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Ron DeSantis, Governor

Florida
dbpr

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

BOARD OF ARCHITECTURE & INTERIOR DESIGN


THE ARCHITECT HEREIN IS LICENSED UNDER THE
PROVISIONS OF CHAPTER 481, FLORIDA STATUTES

HUBER, JEFFREY ERWIN
BROOKS + SCARPA ARCHITECTS, INC.
2808 NE 10TH TERRACE
WILTON MANORS FL 33334

LICENSE NUMBER: AR95504

EXPIRATION DATE: FEBRUARY 28, 2023

Always verify licenses online at MyFloridaLicense.com

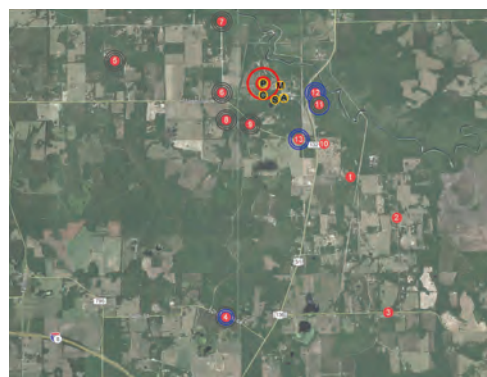


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E. Siebein Acoustic Soundscape Assessment and Design Portfolio

Please see included our Soundscape Assessment and Design portfolio which features several of our relevant projects.



SIEBEIN
ACOUSTIC
ARCHITECTURAL | ENVIRONMENTAL

PROFESSIONAL QUALIFICATIONS

Acoustical Design & Noise Control

for

SOUNDSCAPE ASSESSMENT + DESIGN

625 NW 60th Street, Suite C
Gainesville, Florida 32607
USA

(T) 352.331.5111
(F) 352.331.0009

www.SiebeinAcoustic.com

WHO WE ARE

FIRM INTRODUCTION

Siebein Associates is a leading acoustical consulting firm established in 1981 headquartered in Gainesville, Florida. We have a broad range of diverse experience in acoustical design and research that enables us to provide state-of-the-art consulting services. We pioneered the development of soundscape design methods to assess, measure, model, simulate and predict the acoustical qualities of complex urban environments.

We specialize in the design of spaces for natural acoustic and amplified performances in many different venues. We have pioneered the use of advanced acoustical measuring systems to evaluate acoustical challenges in indoor and outdoor spaces as well as computer modeling methods to assess prospective design solutions.

Siebein Associates employs advanced technical systems to assess the sonic environment in urban and suburban landscapes and can tailor our services to the unique aspects of your project and the affected areas. We have the equipment to perform field measurements in conformance with ANSI, ASTM, ISO and other standards for most acoustic situations.

We have completed work on over 2,400 challenging projects worldwide and are considered one of the premier acoustical consulting firms in the world. We have received awards for research and acoustical design from the American Institute of Architects, the Association of Collegiate Schools of Architecture, the National Council of Acoustical Consultants, and Progressive Architecture.

Siebein Associates is a growing firm with trained professionals who have significant educational and project experience in acoustics, soundscape design, environmental noise and architectural acoustic design.

Our design philosophy is to create state-of-the-art environments using advanced technology, critical listening by experienced staff, and dedication to our client to achieve superior acoustics. We achieve this by utilizing a combination of advanced research, extensive project experience, innovative acoustical design techniques, and a team-oriented approach to work in a fully integrated manner with clients, architects, user groups, and other key design team members to establish unique acoustical identities specific to the needs of each individual project.



Rita A. Siebein
President
Marketing, Human Resources,
Accounting

Gary W. Siebein, FASA, FAIA
Senior Principal Consultant
Overall Project Management
Quality Control Review
Environmental Acoustics



Keely Siebein, ASA, INCE
LEED AP BD+C
Associate Principal Consultant
Architectural Acoustics
Environmental Acoustics

Gary Siebein, Jr., CTS, AVT
Senior Consultant
Technical Acoustic Specialist
Field Measurement & Data
Analysis



Marilyn Roa, AIA, ASA, INCE
Senior Consultant
Architectural Acoustics
Environmental Acoustics



Jennifer Miller, ASA,
Assoc. AIA
Senior Consultant
Architectural Acoustics
Environmental Acoustics

Matthew Vetterick
AIA, NCARB
Senior Consultant
Architectural Acoustics
Environmental Acoustics



WHAT WE DO

SOUNDSCAPE PLANNING AND DESIGN

We have successfully completed hundreds of environmental noise assessments involving a variety of urban soundscape, amplified entertainment, traffic, aircraft and noise ordinance issues. Our company motto reflects our background, skills and direction for the future as it applies to sound studies: "Intelligently designing architectural, urbane and natural soundscapes for creative and healthy living." This succinctly addresses the contribution that our firm can bring to your project.

Our projects include a combination of facilities that are operating at the time of the study as well as facilities that are being designed. Successful completion of a sound study requires sophisticated experience with both of these project types to accurately characterize the existing situation and then to creatively optimize the quality of sounds for retail/entertainment venues while maintaining the quality of the soundscape in near-by residential areas.

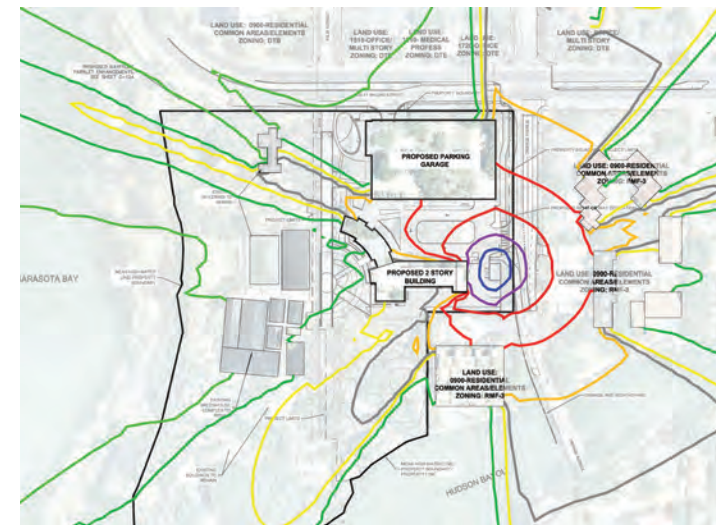
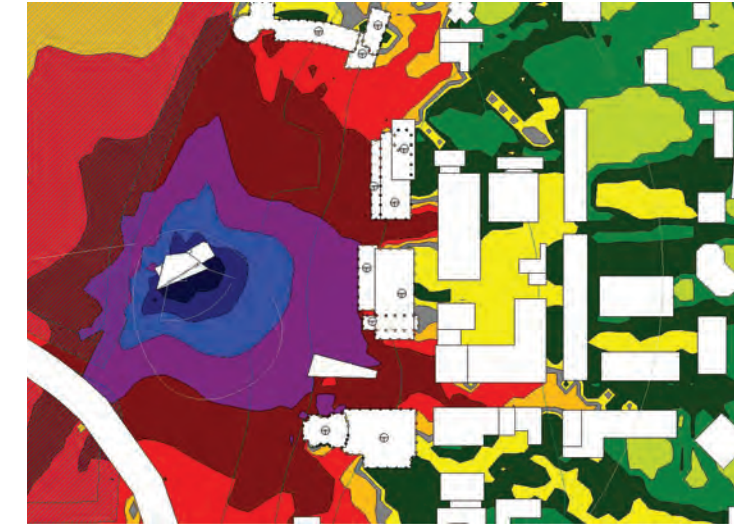
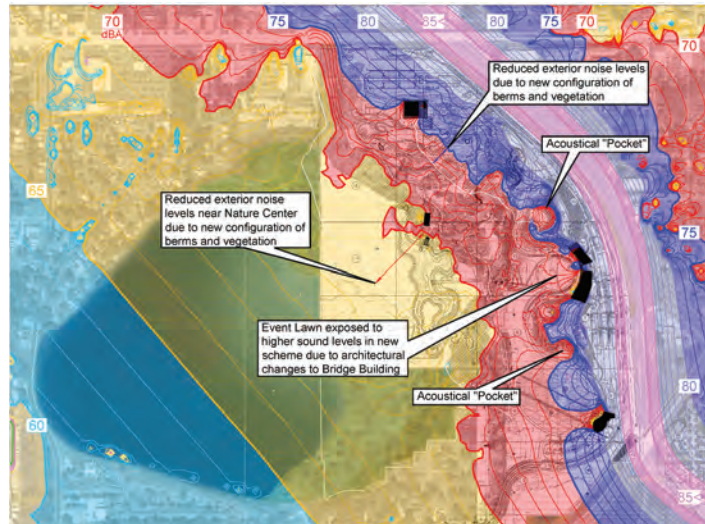
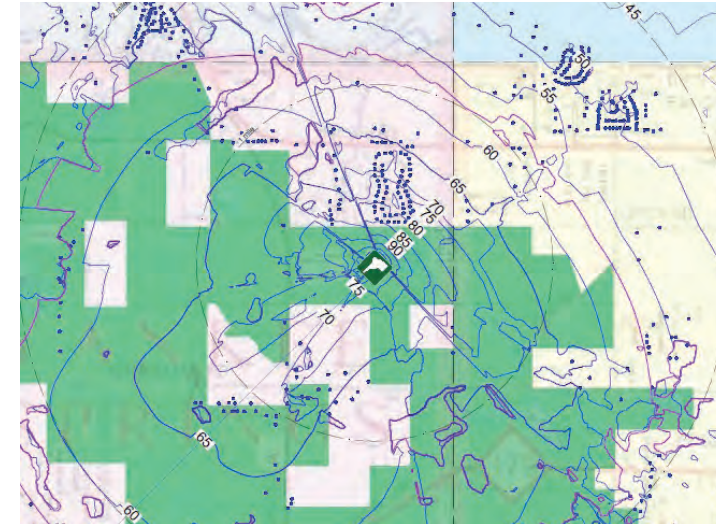
Important components of these projects include:

- Measuring ambient or baseline sound levels in rural and urban areas that have multiple constituent sounds;
- Rigorously defining each of the specific acoustic events in long term measurements that comprise the ambient sound in specific locales so the contribution to the ambient is identified; and
- Accurately measuring the time, frequency and operational variables associated with multiple permanent, transient and temporary sound sources.

Siebein Associates engages in intelligent processes for each work task that helps to build consensus among multiple stakeholders and can clearly present the rationale for each step in the process. We believe that value engineering and optimizing noise mitigation designs for maximum sound reductions can be achieved within limited project budgets.

We develop sophisticated computer models that are accurately calibrated to real world situations and have high degrees of explanatory power to build confidence among the multiple parties involved in many acoustical situations.

We execute work that pushes the state-of-the-art in accordance with national and international standards so it is both legally defensible and creative in the solutions provided; and actively seek balance among regulatory agencies and laws, community interests, sustainable economic growth and the best interests of all parties involved.



WHAT WE DO

PRESENTING COMPLEX INFORMATION TO MULTIPLE CONSTITUENCIES

Senior Principal Gary W. Siebein was a professor in the School of Architecture at the University of Florida where he directed a graduate program in building and environmental acoustics for 35 years. In this capacity he has lectured at universities, colleges, standards committees, professional societies and other groups and has served on national and international committees involved with acoustical research and standards.

This experience of distilling essential information in a way that is understandable by non-technical citizens and governmental agencies is a hallmark of our practice. We have presented the process and results of noise studies to City and County regulatory agencies, planning commissions, Boards of Commissioners and other governmental agencies. We have also conducted acoustical training and certification classes for private industries and public agencies so that their staff can effectively monitor sounds when needed.

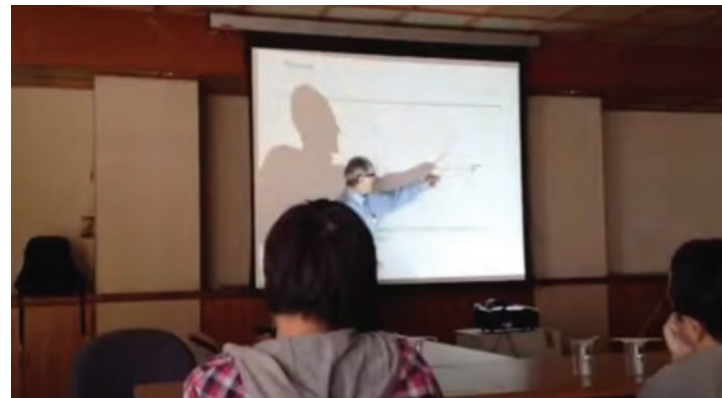
The extensive use of auralizations or actual calibrated listening experiments so stakeholders can listen to the acoustical ramifications of potential mitigation options and visualizations of sound paths as rays or waves so that the causes of sound issues can be seen are among the methods used to help citizens, governmental agencies and other stakeholders understand the causes of situations so they can appreciate the need for and the effectiveness of proposed solutions.

Siebein Associates, Inc., has also acted as an expert witness for many projects involving acoustical issues for amplified entertainment venues, large amphitheatres, entertainment districts in cities and towns, traffic noise impacts and soundscape quality in residential neighborhoods are among the project types we have worked on.

We specialize in taking acoustical measurements that accurately characterize the sounds as they are experienced by people, conducting acoustical analysis of the data that allows us to identify the paths responsible for the sounds that are being heard and designing effective mitigation systems using the full range of available technologies including infrastructure interventions, administrative controls and sound system controls to achieve a balance between the acoustical quality at the venues and the soundscape in adjacent areas.

We are prepared to conduct field measurements, review existing facilities to identify sound sources, develop models to predict future impacts of sound transmission, provide a plan to assist in the mitigation of existing and future noise impact to find practical and economical solutions to a number of challenging acoustical situations. planning and zoning boards.

We take pride in our ability to translate technical acoustical principles into terms that clients, city legal staff, enforcement personnel and citizens can understand. Gary W. Siebein, Senior Principal Consultant, Hyun G. Paek, Principal Consultant, and Keely Siebein, Senior Consultant, are qualified as experts in multiple districts and have presented expert witness testimony in court, at quasi-judicial hearings for city and county commissioners, and for a number of planning and zoning boards. They have developed the ability to distill complex acoustical concepts into language that is easily understood by lay persons through years of experience teaching students and lecturing to technical and non-technical audiences.



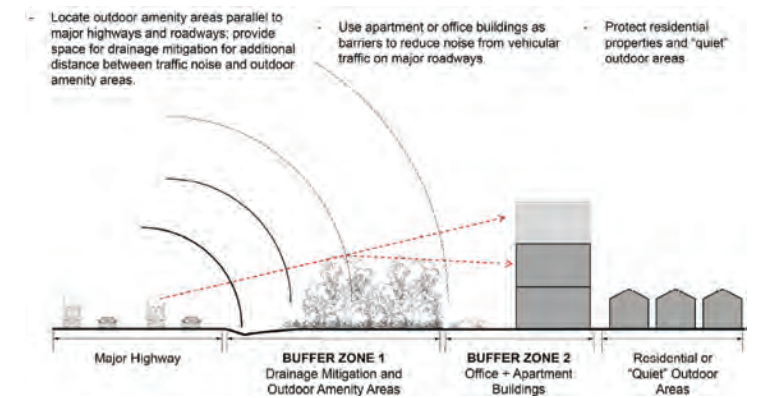
REGULATORY, CONTRACTUAL AND JURISDICTIONAL MATTERS

Siebein Associates, Inc., has worked with many states, counties and municipalities to address the acoustic impacts of noise upon residents. Noise from entertainment venues, large crowds, traffic, various modes of transportation, mechanical equipment, industrial facilities, etc. must be effectively managed within the complex soundscape of an urban community.

We work with government agencies and private and public sector clients to:

- Prepare acoustical assessment reports for existing and proposed projects;
- Review development proposals;
- Develop acoustical master plans for the soundscape of livable, urban communities;
- Determine compliance with ordinances or specific acoustical requirements established by local jurisdictions;
- Perform measurements and analyses to quantify acoustical levels and/or locate noise source(s);
- Predict future noise levels using sophisticated modeling techniques;
- Design and/or recommend appropriate mitigation measures to reduce noise to acceptable levels;
- Draft, review noise ordinances.

We achieve reasonable balances between the various complex interactions of multiple stakeholder groups and can effectively present realistic aural simulations to groups in public forums so individuals may aurally sample acoustical "sketches" of various design options. This allows effective communication of the acoustical consequences of planning decisions and associated costs.



NOISE ORDINANCE REVIEW AND / OR DEVELOPMENT

We have worked many communities to develop and/or revise noise ordinances that are suited to the unique acoustical situations of each locality. We strive to achieve a practical balance between the desires of residents for high quality urban and suburban life styles in rapidly growing and redeveloping communities with the needs of businesses and industries to grow and prosper. We bring advanced measuring techniques to assess the qualities of the soundscape, or acoustical landscape, of each community to the project. These techniques have been developed through Professor Siebein's research at the University of Florida. This is an interactive process involving city planners, business owners and residents designing for positive sonic qualities in communities to enhance the quality of urban life while reducing, buffering and mitigating undesirable sounds before they arise.

Municipalities including Dunedin, Sarasota, Bradenton, Tampa, and Daytona Beach in Florida and Hilton Head Island, South Carolina have engaged our firm to develop sophisticated ordinances that are necessary to build a sense of community between the residents and commercial enterprises that comprise the fabric of the new American urban center. One of the principles for legal requirements for defensible noise ordinances is that the ordinance is tailored to the distinctive acoustic environment of the specific community. Therefore, we measure and monitor ambient sound levels within the environment so that a detailed profile of the sonic variance within communities can be developed.

HOW WE DO IT

FIRM INNOVATION

Siebein Associates, Inc. has developed innovative urban soundscape design, analysis and mitigation approaches to design healthful sonic environments. This work has been widely published by Senior Principal Gary Siebein and has helped define the field of applied soundscape design. His latest publication is a book chapter in a soundscape design handbook forthcoming from Springer.

This process can limit the impact of potential noise sources and optimize the points-of-view of all stakeholders with highly creative, technically sophisticated acoustical solutions. We use an interactive process to explore design solutions through a multi-discipline effort that includes the Client, county planners, government officials, developers, design team members, and citizens.

The soundscape design and planning process involves:

- Soundwalks to identify acoustic zones and issues;
- Focus group discussions and evaluation to identify issues and concerns;
- Long term monitoring of sound levels at critical locations;
- Short term measurements and calibrated recordings of specific acoustic events that comprise the ambient with adequate resolution to distill the source and meaning of the many sounds that comprise the ambient;
- Mapping of existing and proposed situations;
- Modeling of proposed interventions;
- Auralizations of potential solutions for review by focus groups.

We have developed a method to analyze potential noise impacts from new developments and large scale projects to allow detailed enough assessment of the sounds at individual locations in a community to design for true "net zero" noise impacts when this is necessary to achieve. In other words, facilities that produce sounds that travel off-site can be designed so that they can achieve sound levels that are within the range of existing background sound levels even under adverse weather conditions. This important analysis technique has been refined through our design work for a number of private and municipal clients facing severe acoustical challenges.

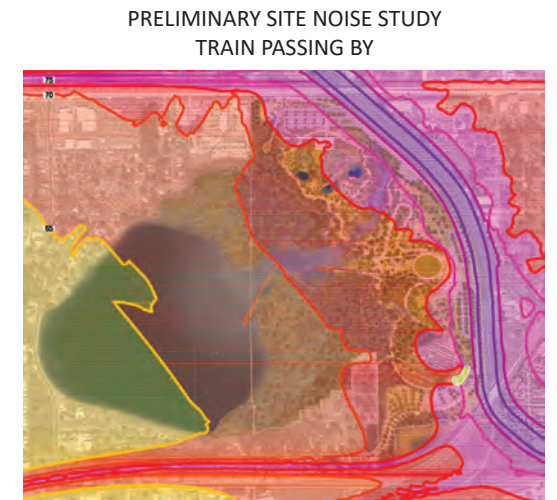
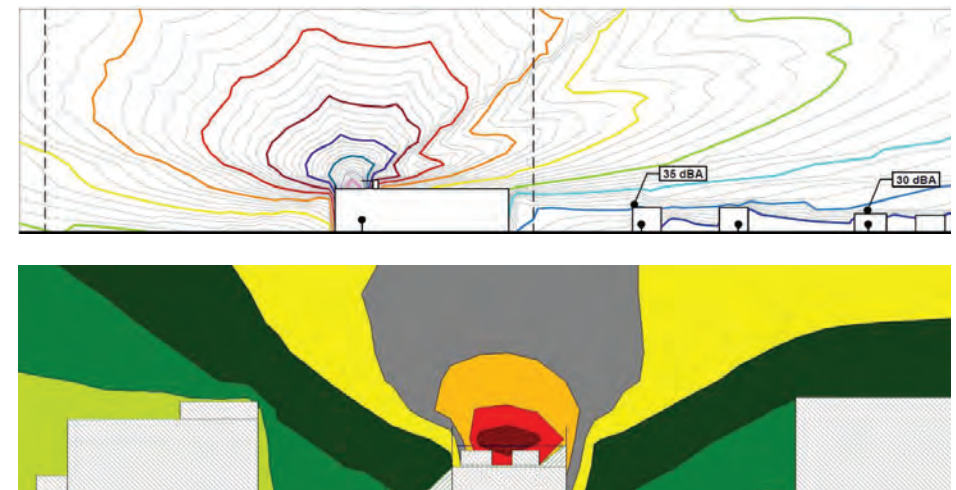
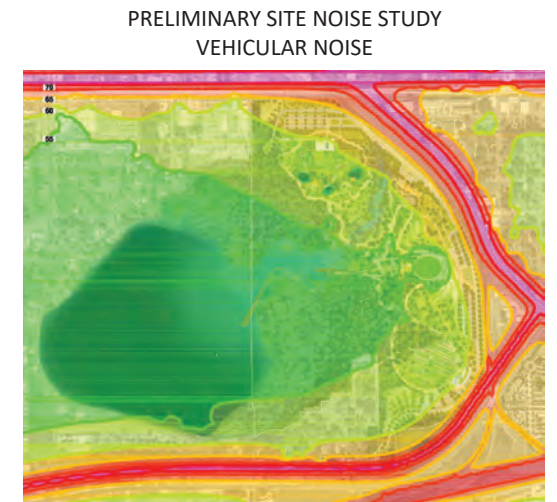
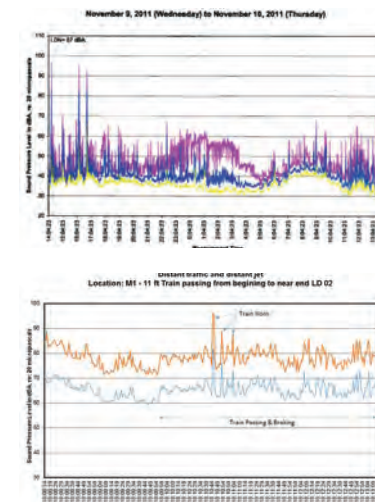
If the situation allows, a weighted sound pressure x impacted property metric can be used as a quantitative method to assess the number and magnitude of impacted properties for a base condition and for mitigation options. This approach has been successfully used to evaluate potential impacts and the viability of alternative mitigation options from shooting ranges among other project types and can be easily transferred to amplified entertainment venues.



OUR PROCESS

Our typical process for soundscape assessment and design includes, but is not limited to:

- Project Kick-off, Work Plan and Initial Research
 - Initial Meeting
 - Public Outreach Meetings
 - Developer Meeting
 - Plan Preparations
 - Data Review
 - Literature Review
 - Review Meetings with Stakeholders
- Comprehensive Sound Study
 - Topographical Review
 - Control Survey
 - Event Sound Impact
 - Sound System Evaluation
 - Traffic Sound Assessment
 - Time/Day Sound Assessment
 - Monitor Location Evaluation
 - Compare Data
 - Compliance Evaluation
- Sound Level Measurements
- Data Analysis of Measurement Data
- Reports and Presentations of Initial Findings
- Recommendations
 - Sound Impact
 - Ordinance Proposals
 - Contractual Compliance
 - Monitoring Devices
 - Engineering and Design
 - Computer Model Studies and Data Analysis
- Final Reporting



WHY WE DO IT

Siebein Associates, Inc. exists to increase public awareness of exceptional acoustics, to provide state-of-the art acoustical consulting services for a wide variety of projects, and to enrich the basic quality of community life through ongoing research and practice in building and environmental acoustics.

The firm is dedicated to achieving acoustical excellence and accomplishes success by utilizing a combination of creative thinking, extensive project experience, innovative acoustical design techniques and a team oriented approach to work in a fully integrated way with clients, architects, user groups and other key design team members to establish unique acoustical identities specific to the needs and ambitions of each individual project.

“We are grateful for their excellent work.”

The end result: simply stunning. These impressive elements are an unmistakable testament to the field knowledge, effective design approach, and attention to detail which characterize the Siebein Associates, Inc. team. While always adhering to exact scientific standards, this unit has never failed to surpass my personal standards in terms of quality and aesthetics.

*Dr. Jonathan Steele, Dean
College of Fine Arts and Humanities
St. Petersburg College*

Dear Gary,

Your article from Noise-Con last fall (Reno, October: Case studies illustrating the importance of) came across my desk and I was yet again impressed by the practical and clear manner in which you presented your case studies. I shared this with the acoustics class I teach at M.I.T. as an example of thoughtful technical presentation, and it was a great way to discuss impact noise with its problems and challenges.

Thanks again for such well-presented work.

*Carl J. Rosenberg, Principal
Accentech*

Dear Gary,

As I hope I have expressed to you on many occasions, it was an absolute pleasure working with you and we could not have achieved the result that we did without your great work and the work of your colleagues.

*J. Wiley Hicks
The Law Office of Wiley Hicks*

Gary and Team:

“Thanks for the very good report of the work you have done.

Gary’s presentation before the City Commission summarized the results very well in the brief period allotted. The pace, succinctness, and preparation kept it from tediousness. Very good!”

*Henry Gotch
Florida Rock Industries*

“They worked seamlessly and professionally with our district personnel, architect, and myself to achieve our specific goals and needs.”

*Dr. Craig Collins, Dean
College of Arts and Media
Southeastern University*

“The expertise and overall knowledge of acoustical design and testing that Siebein Acoustic possesses is by far, superior to anyone else in the nation.”

*Bill Bergiadis, CEO
Troy Acoustics*

“I had no idea it was going to turn out like this. It’s magnificent. There’s not a bad seat in the house.”

*Stu and Sally Krell
Charlotte Performing Arts Center*

I have been pleased with the renovation. I have noticed a dramatic reduction in the echo in the room. Overall, I am happy with the results.”

Thanks,

*Paul Rayius
Band Director
Osceola Middle School*

MISSION

At Siebein Associates, Inc. our company’s values and design principles are philosophically grounded, theory-based and practice driven. We rely on our team’s innovation, expertise, collaboration, inspiration, resourcefulness, artful designs, scientific methods and proven results to achieve superior acoustical design.

Grassy Waters Preserve Environmental Acoustic Assessment West Palm Beach, Florida

Siebein Associates conducted an Environmental Acoustic Assessment for the Expansion of SR7 on the Grassy Waters Preserve. We assessed the existing acoustical conditions on the Grassy Waters site; conducted a review of acoustic criteria from FDOT, FHWA and the technical literature on noise levels interfering with communication among birds; estimates of noise levels from traffic on the Grassy Waters site for the current conditions; the 2040 build alternative for the SR 7 expansion; the 2040 no-build alternative; and provided acoustical design recommendations for possible noise mitigation options to reduce the projected future noise levels attributed to the SR 7 expansion to criterion levels.

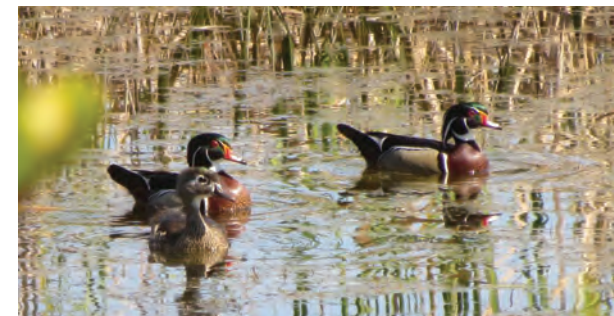
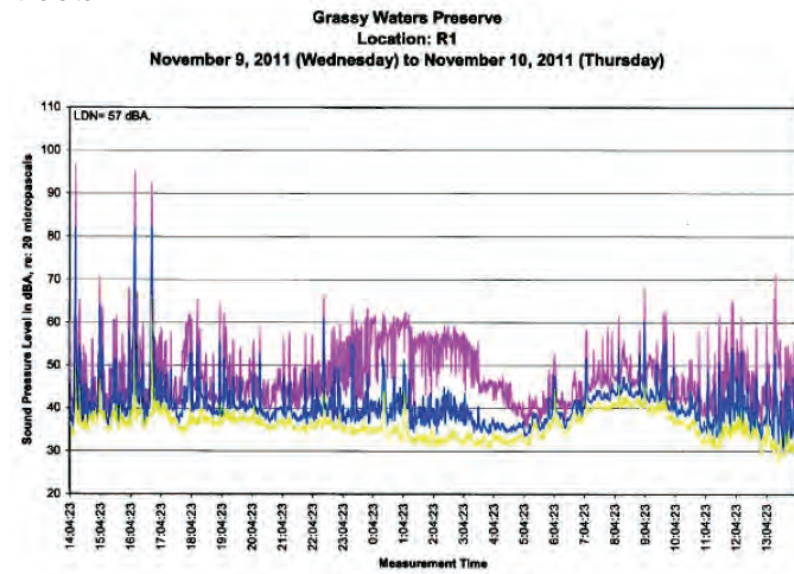
We conducted two types of acoustical measurements in the Preserve. Long term measurements of average sound levels in the preserve were taken to document the general levels and time histories of sounds as they vary over the course of the day and the week at key locations in the preserve. Short term measurements of specific acoustic events were taken to record the sound level versus frequency or pitch characteristics of the individual sounds that comprise the soundscape of the preserve.

The acoustical measurement locations were selected to represent the acoustical zones of the site. The acoustical zones consisted of areas dominated by traffic noise; public use areas including board walks and pavilions on the paths of the site accessible by land; and locations within the preserve at distances away from the boundaries of the preserve where anthropogenic sounds are reduced in quantity and level.

We also conducted a traffic noise study involving present and future predicted traffic conditions and constructed computer models to determine noise mitigation design for present conditions as well as future predicted conditions.

We were able to conclude from our environmental acoustic assessment that sound levels from the SR 7 expansion would increase the area of the Grassy Waters Preserve that is impacted by noise levels above the FDOT criterion of 56 dBA for lands on which serenity and quiet are of extraordinary significance and the 50 dBA levels contained in the literature as adversely affecting bird communication by approximately 420 and 600 acres respectively. The future traffic noise levels could be reduced to approach the criterion levels by construction of a sound barrier wall or berm along the SR 7 right-of-way that is approximately 8 ft. tall to approach the 56 dBA criterion and 16 ft tall to approach the 50 dBA criterion.

Our assessment also revealed approximately 300 acres that would be impacted by the FDOT criterion of 15 dBA increase in sound level above the existing ambient sound levels. Existing ambient sound levels indicated by the L90 were 37 to 38 dBA along the western side of the site.



Soundscape Analysis and Acoustical Design Strategies for an Urban Community Development Gainesville, Florida

Overall establishment of an acoustical landscape (soundscape) is a fundamental source of sonic information that is useful in initiating urban design and planning strategies. Environmental acoustics (soundscape or acoustical landscape) of a western section of Gainesville, Florida was studied for its urban transportation and community development by means of both quantitative measurements and qualitative assessments. Effects of environmental acoustics on the project area in the existing and future contexts were also analyzed to suggest acoustical urban design strategies that can be implemented at the initial community design phase.

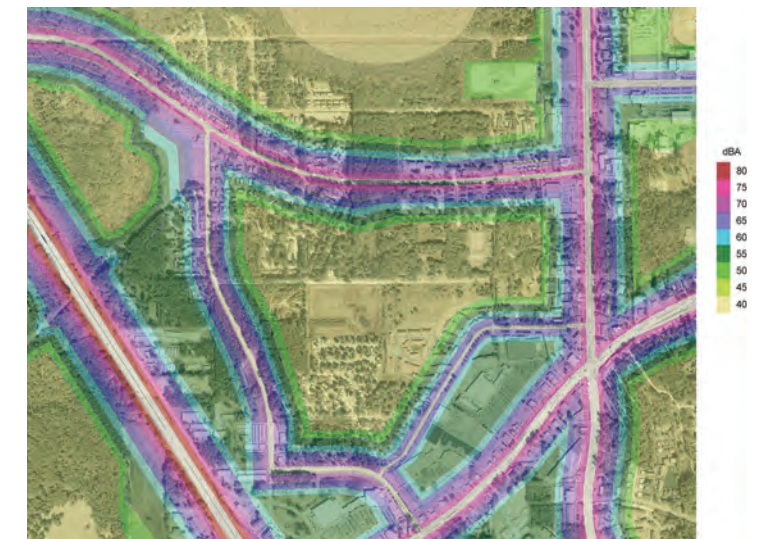
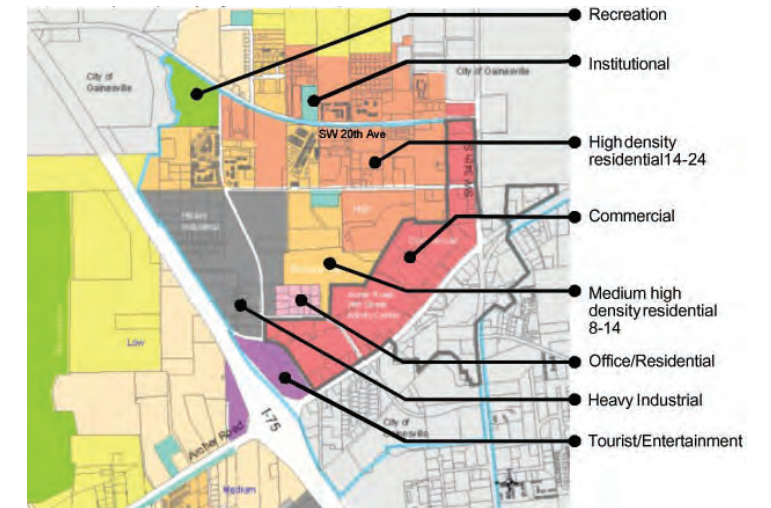
The community was acoustically characterized and analyzed by means of quantitative measurements and qualitative assessments by observation. The measurements included instantaneous, 1-minute short-term and 24-hour long-term measurements. The parameters involved in these measurements are A-weighted average Lp, Leq, Lmax, Lmin and LDN. The overall sonic environment of the community as well as the types of sounds that are desirable and noises that are not desirable in the existing and future contexts were identified.

It was found that the project area was dominated mostly by traffic noise coming from several major transit roads including an interstate highway. Fire alarms coming from a fire station that is in the middle of the project area occasionally intruded upon the community. Particularly after a few planned transit roadways are newly constructed, traffic noise was expected to affect all over the project area.

Sounds that should be preserved included some natural sounds currently present around the cemetery and the northern wetland as well as people activity and natural sounds present in and around Forest Park. Some other people activity sounds are expected to be added primarily along the new cycling trail according to analysis of sonic characteristics on the proposed various land-use development plan.

Acoustical urban design strategies were suggested to reduce, buffer or mitigate any undesirable sounds and to preserve any desirable sounds in the existing and future contexts. The strategies controlling the undesirable sounds included landscaping system, barrier wall system, vegetation, buffer zoning, sound masking method, source treatment using enclosures, etc. The strategies protecting the desirable sounds included site planning, building orientation, etc. In addition, combined multiple strategies were suggested and applied for the specific urban transportation and community design plans that were proposed without acoustical consideration by architectural designers. Other acoustical design suggestions were further made, including allocation of the new cycling trail along the roadways or various types of land-use areas.

Soundscape analysis should not be the last agenda to be executed when an urban community is designed or developed. Its results or effects can sometimes be more momentous than expected and therefore, should be reflected in the initial phase of an urban design. Soundscape study would be even critically required where environmental sounds directly affect an ecosystem or people.



Center Place
Fort Myers, FL

Center Place is a proposed mixed-use community in south Florida. The community is situated on a site that is approximately one mile square that is to be built as a university village for over 10,000 new residents. There is an urban core that is sustainable, walkable and livable, with a town center designed around a large public plaza, movie theater, hotel and convention center, restaurant with outdoor dining, large format grocery store, many small retail shops and multiple types of residences including individual apartments, condominium units, townhomes and detached single family housing. Siebein Associates developed strategies to control the soundscape from the mixed-use portion of the site to reduce, mitigate and buffer sounds created on site so that they would not disturb neighbors in an existing development to the south of the site.

Detailed computer models were created to model the impact of the amphitheater, and other various potential noise sources within the community as well as across the lake in an existing community. Siebein Associates went to several similar existing sites to measure sounds typical of an inhabited mixed-use space such as live outdoor music, restaurants with outdoor dining, and amplified speech and music during a festival, and used these sound sources in our models.

By using this innovative approach, we were able to successfully plan and design the acoustic components of the urban core of the community so that it would not impact the surrounding neighborhoods and would fulfill the vision for the project as a lively, vibrant urban core with true sustainable live-work-play function integrated within the fabric of the community.



Lake Nona Community Noise Monitoring Mapping and Land Use Compatibility Study
Orlando, FL

Siebein Associates was engaged by Lake Nona to conduct an environmental acoustic assessment to with long term and short term airborne noise and ground borne vibration measurements; noise mapping of sounds from aircraft overflights from Orlando International Airport, which lies immediately to the north of the development; and then develop land use compatibility plans for the community and noise mitigation plans for specific building types in different areas of the community. The master plan for the community included many single family residences, from economical homes less than 1000 sq. ft to large luxury homes > 5000 sq ft and everything in between. There were also densely populated areas with multi-family housing of various types, several large hospitals and medical research centers, a university, schools, a town center with retail, commercial and office occupancies and many recreational areas.

Siebein Associates, Inc., developed requirements for each building type in each noise zone of the site for outside to inside transmission loss or outside to inside noise level reduction (NLR) for the building envelope systems as well as planning guidelines in terms of which activities should be located on which portions of the site.

Many of the homes, hospitals, research institutes, schools and town center facilities are built out with a fully functioning community developed in close proximity to a major international airport where planning for the sound environment during the earliest stages of the project was initiated to manage potential noise impacts to the greatest extent practicable.



Bonnet Springs Park Soundscape Design and Planning Lakeland, FL

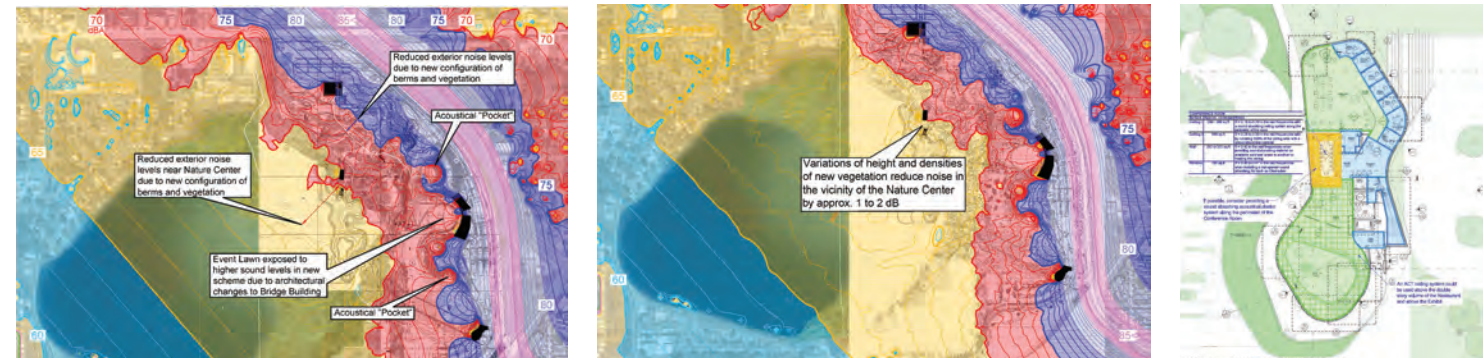
This 180-acre urban park has a Welcome Center, Nature Center, Children's Museum, Event Center, a botanical garden, a full-service restaurant, an event lawn with amphitheater for concerts and festivals, a tree house, a tea house, a nature playground, and many walking and bike paths.

Siebein Associates provided soundscape concept design and planning strategies for the park as a whole including a sonic design charette to discuss intentions and strategies with the Design Team and user groups and to draw out issues and approaches for consideration as the project progresses.

Our consultants conducted base line sound and vibration measurements of the rail, road traffic and industrial noises near the site as well as the more pleasant, atmospheric sounds of the lake, neighborhoods and marshes that currently exist.

We defined acoustical criteria for indoor and outdoor program spaces and developing an Acoustical Program that draws on the sounds and other sensory/perceptual/experiential aspects of the garden, buildings and park spaces. We provided noise mitigation concepts and acoustical interventions as part of the emerging site planning and landscape/ soundscape design for the facility to draw attention away from the existing sounds of the site if needed.

Siebein Associates, Inc. also provided acoustical design approaches for interior finish systems, sound isolation systems, exterior skin systems and mechanical system noise and vibration control systems during Design Development and review of the systems as they are implemented in the Construction Documents phase of the project culminating with providing assistance to the Architect with specifications and details of selected acoustical systems.



Marie Selby Botanical Gardens Sound Studies and Soundscape Analysis Sarasota, FL

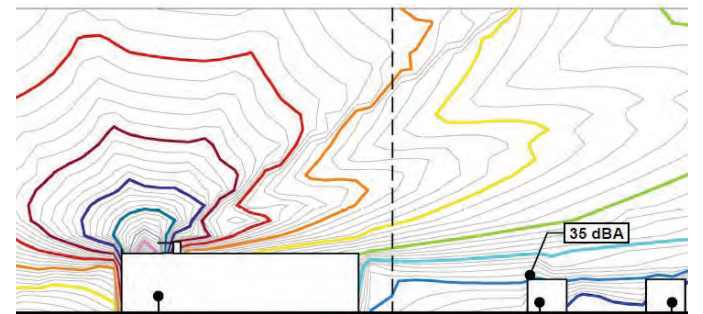
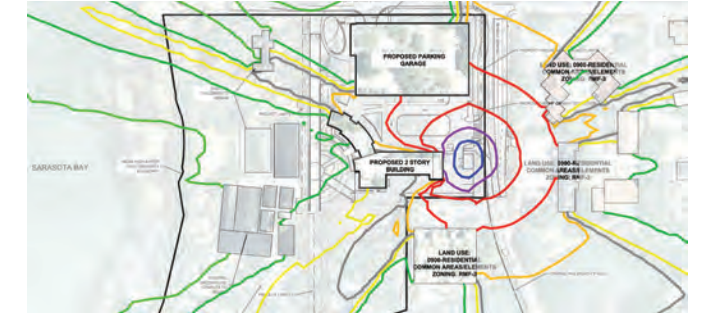
The Marie Selby Botanical Gardens is a 15-acre oasis located in downtown Sarasota. It is dedicated to education, research and conservation of orchids, bromeliads, gesneriads, epiphytes and tropical plants. Visitors can explore a rainforest garden, tropical conservatory, bamboo garden, banyan groves featuring nearly 100-year old specimens, fern gardens, a koi pond and a boardwalk that meanders through a mangrove colony. Each year more than 230,000 visitors experience the gardens.

In an effort to grow the walkable garden space and to protect the scientific collection from future sea level rise, the institution planned a \$92 million expansion plant research building, a solar-powered rooftop restaurant and a recreational trail. The expansion plan was designed to increase garden space by 50% within the existing footprint and to add more public park space.

The gardens are surrounded by residential and mixed-use properties. Residents were concerned about the increased level of noise that would be generated by the new buildings and increased traffic.

Siebein Associates conducted extensive site noise studies at multiple locations within the park, reviewed City noise ordinances, performed sophisticated acoustical analysis, developed noise contour mapping and constructed 3D computer models of the proposed buildings and soundscapes. We provided acoustical design recommendations for noise mitigation of the existing and proposed designs to keep noise levels within City Noise Ordinance levels.

We attended multiple Plan Board Meetings presenting our findings and our acoustical recommendations to Board Members, City Staff, attorneys and residents.



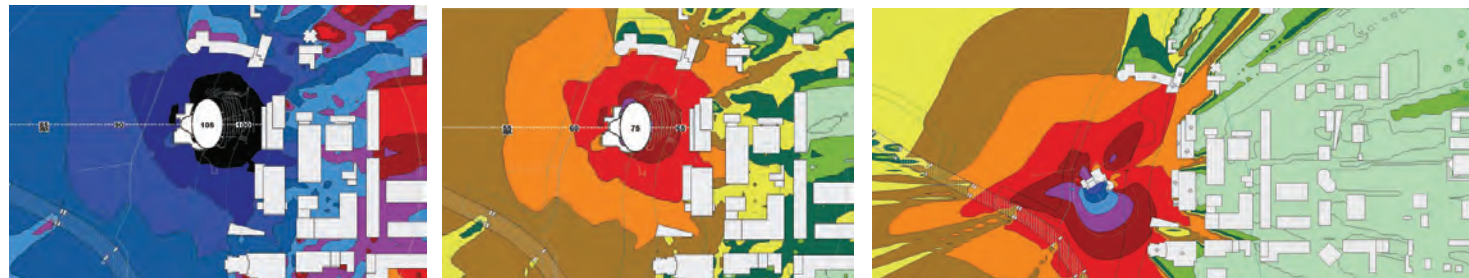
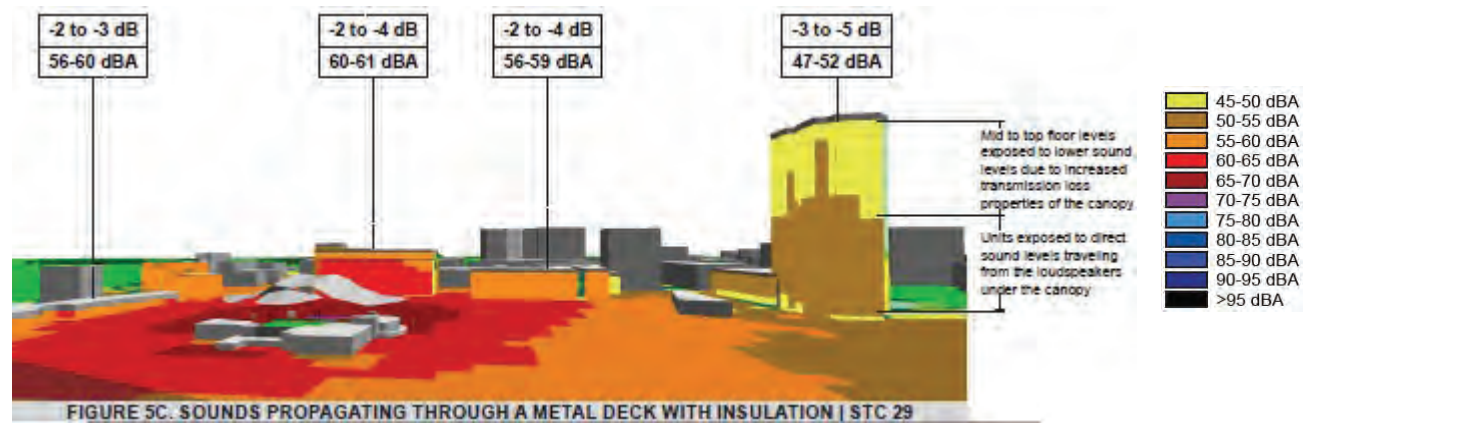
Imagine Clearwater Coachman Park Sound Study and Soundscape Analysis Clearwater, FL

The City of Clearwater approved an \$84M master plan to redevelop and rebrand its aging and underutilized waterfront buildings and spaces into a unified community-strengthening asset where residents of Clearwater can live, work and play. The new park will have a concert green with a 4,000 seat under roof amphitheater with over 10,000 additional seats on the lawn, a shaded half-mile waterfront walkway, gardens, event areas and more.

Siebein Associates conducted event noise monitoring and base line ambient sound level measurement for the proposed amphitheater, reviewed City Noise Ordinances and conducted a design charette to provide concept design and shaping of the amphitheater enclosure based on the acoustical analysis of the measurements conducted.

Our consultants are conducting acoustical analysis and constructing 3D computer models of the amphitheater to study shaping and materials relative to sound projection from natural acoustic and amplified sources. We are providing recommendations for acoustic finish materials to optimize the natural acoustics of the facility for natural and amplified acoustics and to allow for integration of sound reinforcement, lighting and rigging systems.

Siebein Associates is also providing comprehensive acoustical design of the state-of-the-art audio/video systems for the amphitheater.



The Villages Florida Turnpike Planning The Villages, FL

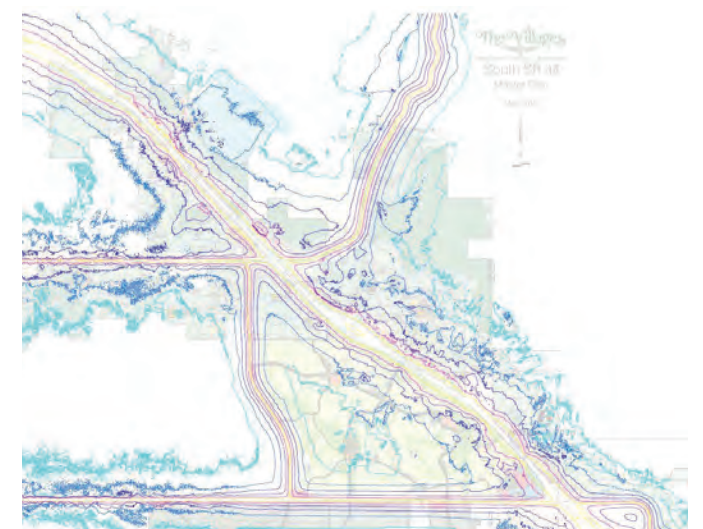
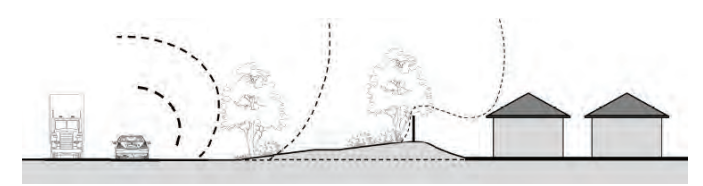
The Villages, located in central Florida, is one of the fastest growing 55+ retirement communities in the United States, growing more than 37% since 2010 to over 122,000 residents.

The master-planned community extends across large areas of 3 counties and offers homes villas, doctors and hospitals, town squares, entertainment, shopping and dining, recreation, golf and so much more. The community is designed to avoid the highways and turnpikes so that residents can use their golf carts to travel around The Villages. The developer carefully designed strategically placed bridges over the main thoroughfares, highways and turnpikes allowing safe and uninterrupted access for residents driving golf carts.

Very recently, The Villages acquired an additional 10,000 acres with initial plans to build approximately 4,500 homes and commercial developments. With walking trails and golf cart trails running alongside busy highways and some of the homesites fairly close to the roadways, the developer sought Siebein Associates' expertise in soundscape planning to conceptualize strategies to buffer traffic noise from the homes, recreational facilities and their amenities.

Siebein Associates conducted extensive site noise studies and acoustical measurements over several miles of roadways that run through the development site. We performed extensive acoustical analysis, developed noise contour mapping and constructed 3D computer models of the soundscapes of the development.

We attended multiple planning meetings and provided acoustical design recommendations for noise mitigation including natural berms and sound walls to buffer and mitigate the sounds of traffic noise and planning the trails and walkways to maximize the existing environment as a natural buffer. The natural contours of the site, topography of golf courses, amenities and buffers, and strategic conservation area planning are all considered in the soundscape analysis.



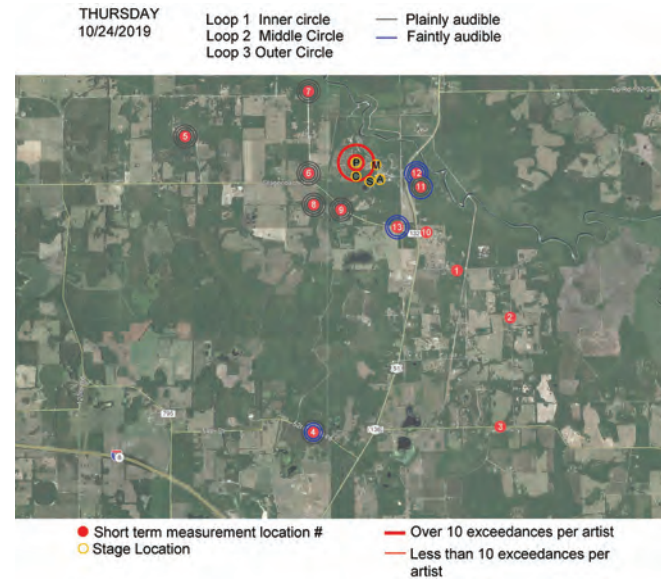
Suwannee Hulaween Event Noise Monitoring

Live Oak, FL

The Spirit of the Suwannee is a music park and campground that hosts a variety of mostly outdoor musical events throughout each year. The venue has a natural amphitheater and a music hall and offers several options for camping including RVs, tents, cabin rentals and even horse camping. For its annual Hulaween event which features multiple bands performing on multiple stages, the venue owner engaged Siebein Associates to conduct acoustical measurements and observations during the event.

Five consultants from Siebein Associates conducted acoustical measurements onsite over the course of the 4 day / 3 night event. We conducted weighted average measurements to estimate potential noise exposure near the stage areas. We conducted acoustical measurements at or near residences and provided prompt alerts to the Client when any of the 5 minute LAeq measurements at the locations exceeded the sound levels specified by the Client.

Our consultants reviewed drawings and layouts of the performance areas, analyzed the data from the acoustical measurements in our lab, conducted acoustical analysis of various noise mitigation options and provided the Client with conceptual acoustical recommendations on noise mitigation strategies.



Dunedin Noise Ordinance Development

Dunedin, FL

Siebein Associates, Inc. conducted an acoustical review of the proposed revisions to the City of Dunedin Noise Ordinance to investigate specific issues related to amplified music and/or human voices propagating from various entertainment and dining establishments to adjoining residences. A series of acoustical measurements were made at locations around the community and in the vicinity of the entertainment and dining establishments to document existing sound levels and identify acoustical zones within the City.

Our analysis revealed the entertainment and dining establishments were generally in compliance with the sound level limits in most noise ordinances, but they were very close to the point where exceedances and disturbances could occur with minor adjustments of the sound systems. Nine acoustical zones were identified in the community with specific acoustical attributes. Each zone included an entertainment establishment, surrounded by several residences where a large number of complaints stemmed from. The residences around the establishment were found to create a noise barrier, wherein the sound traveled from the establishment and was directed to the residences directly surrounding it. The residents in these houses bore the brunt of the sonic impact, and therefore received the loudest sound levels, as their houses literally became sound walls to the rest of the neighboring houses.

After modeling the sound and comparing with field measurements, it was determined that the residents who were originally considered "super-sensitive" neighbors to the bar owners, were in fact, exposed to much higher sound levels than everyone else around them, and there was scientific evidence to prove this. This was a pivotal finding in our study, as each zone experienced this same phenomenon. It was due to these extensive acoustic measurements that recommendations for fine tuning of technical provisions in the proposed noise ordinance could be provided. Siebein Associates was able to help review and revise the noise ordinance so that it could be rooted in the acoustic characteristics of the community.



Relevant Project Experience

Green Iguana Noise Study, Tampa, FL

Siebein Associates, Inc. conducted acoustical measurements with real time analyzers in the Green Iguana Bar and Grille and at two residential sites that were sources of noise complaints from sounds propagated from the Green Iguana Bar and Grille/Veterans Expressway area location during nighttime hours. Acoustical recommendations to meet the requirements of the Rules of the Environmental Protection Commission (EPC) of Hillsborough County were then given to the Green Iguana based on the onsite acoustical measurements, consultant observations, and data analysis that was performed in the Siebein Associates office.



South Daytona Beach City Noise Ordinance Study, South Daytona Beach, FL

Siebein Associates, Inc. performed acoustical measurements of ambient conditions and compared them with acoustic measurements taken while a particularly troublesome dining establishment was operating. A review of the current noise ordinance was performed and comments and recommendations were provided to reduce the noise levels from the dining establishment.



Hard Rock Cafe, Hollywood, CA

The Hard Rock Hollywood planned to open in an existing upscale shopping mall and had to meet stipulated sound level limits. The surrounding stores had relatively low ambient sound levels and required a certain acoustic environment to maintain that atmosphere. Siebein Associates worked with the Architect and design team to develop substantial sound isolation so that sounds from Hard Rock would not disturb the nearby tenants. Acoustic finishes were designed to control excessive reverberation inside the rooms. We worked with the sound system to optimize coverage and reduce unnecessary spill into areas that did not need the sound. We recommended overall and low frequency sound levels that Hard Rock could play and still be in compliance with the lease terms. Through a combination of upgrades to the building infrastructure, acoustic finishes within the rooms, and fine tuning of the sound system, the stringent lease conditions were able to be met and sound bleed to the neighboring shops was minimized.



Seminole Paradise Theater, Hollywood, FL

The Seminole Hard Rock Casino planned to build a large-scale multi-purpose arena seating 5,500, to host everything from big name entertainers and comedians to sporting events including boxing, tennis, rodeos, tractor-pulls and other various events. The acoustic design of this space needed to be versatile enough to provide excellent sound quality regardless of the function. Siebein Associates worked with the design team to provide aesthetically-pleasing acoustic finishes in the room. We also worked to design the building envelope so that the sounds made within the building would be contained and meet the local noise ordinance. Large AHU's had been placed on the roof top of the arena and Siebein Associates provided noise and vibration control to keep them quiet. Designing the acoustic finishes, exterior building skin and providing noise and vibration control for the HVAC allowed this arena to function in any of the ways it's used.



Examples of Traffic Noise Studies for Future Developments

Murphy Oaks HUD Traffic Noise Study, Venice, FL

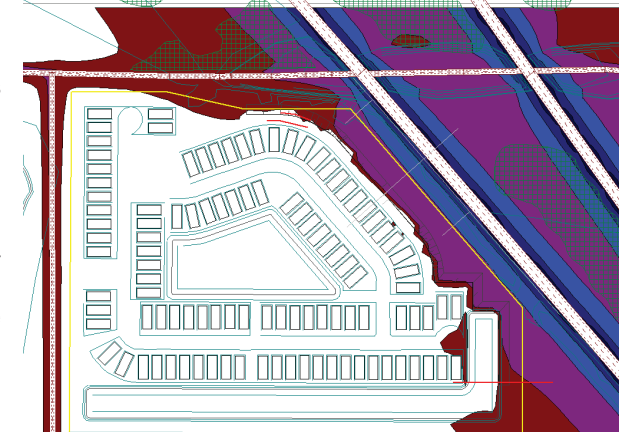
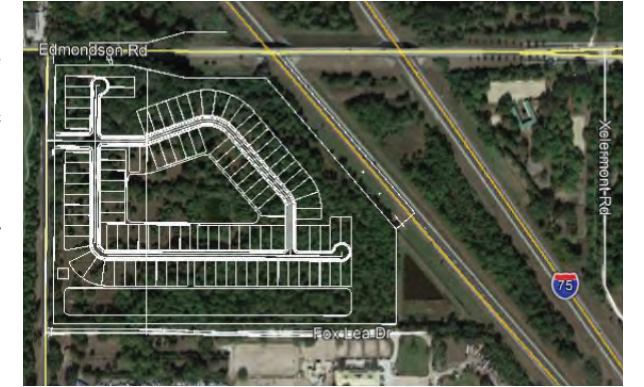
Siebein Associates conducted a site noise study using the HUD site noise assessment tool. We also provided acoustical design recommendations for a noise barrier wall design to meet HUD recommendations for reducing traffic noise levels to 65 dBA or less.

Siebein Associates conducted a HUD traffic noise assessment, for the proposed Murphy Oaks project to determine if the site met HUD and country criteria for sound levels at residential properties. The study was conducted utilizing the HUD online Barrier Performance Module calculator to determine the minimum height of a noise barrier along the east and north sides of the proposed property to reduce traffic noise levels to 65 dBA or less as recommended by HUD.

A three-dimensional model was also constructed by Siebein to verify the minimum height of the noise barrier recommended by the HUD online Barrier Performance Module calculator. Two calculation standard modules were used:

- Traffic Noise Module (TNM) Version 2.5: This is the current model version that complies with the requirements of federal-aid highway projects as determined by the Federal Highway Administration (FHWA).
- RLS90 Guidelines for Noise Control at Roads: This is an evaluation model of noise levels produced by the flow of traffic as published by the German Federal Ministry of Transportation.

The results of the study indicated that at a minimum a 12 ft. tall noise barrier or barrier and berm combination along the eastern property line and along 500 ft. of the property line to the north-east of the site was needed to decrease noise to the minimally acceptable range designed by HUD. We also provided design recommendations for a 16 ft. tall noise barrier or barrier and berm combination along the eastern property line and along 500 ft. of the property line to the north-east of the site.



GL Homes Greystone HUD Noise Assessment, Palm Beach, FL

Siebein Associates provided a traffic noise assessment and noise mitigation strategy for a proposed GreyStone development project in Palm Beach County, Florida to determine the noise levels in the community and to provide barrier height and location recommendations to meet the HUD Noise Assessment Guideline sound levels of 65 dBA or less.

Our consultants modeled several receiver locations of the property at various distances from the future expansion plans for a turnpike along the western portion of the proposed development. Processing and analyzing the traffic and community noise data collected by our traffic noise assessments and using preliminary DDHVs developed for the Palm Beach County Corridor study, Siebein Associates was able to calculate LDN levels for the western portions of the proposed project.

We provided acoustical recommendations for a barrier height of 15.5' maintained at a distance of 170' from the nearest traffic lane after the future expansion of the turnpike that would also wrap around the northern and southern sections of the proposed development.



Ybor City Noise Ordinance Study

Ybor City, FL

Ybor City is an entertainment district located in the historic urban fabric of Tampa, Florida that consisted of multiple city blocks of night clubs and entertainment facilities. There has been tremendous urban renewal in recent years consisting of many commercial and mixed use residential properties being developed in the district. Clubs have also proliferated with the growth the area has seen. This resulted in an uneasy tension between night clubs and entertainment establishments on the one hand and the residents and other commercial establishments on the other. Residents and shoppers felt they were exposed to excessive noise levels from the clubs and entertainment venues that interfered with their normal activities. Siebein Associates, Inc. conducted a study to assist a consortium of stake holder groups consisting of the City, law enforcement personnel, club owners, residents and others to develop revisions to the noise ordinance to reflect the new complexities of urban life in the district.

Siebein Associates, Inc. developed special sound level meters that could be worn in a “fanny pack” with microphones hidden at the ears of a person to record sounds produced by clubs without having to be obvious that sound samples were being taken. In the past, when club operators saw officers approaching to take sound level readings they would simply turn down the volume of the sound system so violations of the noise ordinance could not be recorded. The “undercover” sound measurements demonstrated that the existing ordinance was being violated by many establishments on a continuous basis and that sound levels in residential streets and inside residences were exceeding the noise ordinance requirements.

Police officers working in the streets were also outfitted with dosimeters to record their noise dose. It was found that all officers received levels in excess of OSHA levels for all the shifts during which data were recorded. Siebein Associates presented findings to stake holder groups to seek consensus for revisions to the ordinance, testimony was presented at City Commission hearings and consultations with City legal staff were conducted to draft appropriate language in the ordinance revisions.



Aaron Bessant Park Amphitheater

Panama City Beach, FL

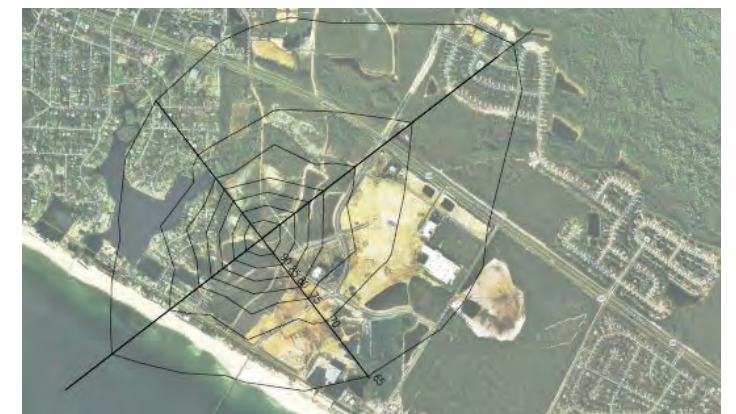
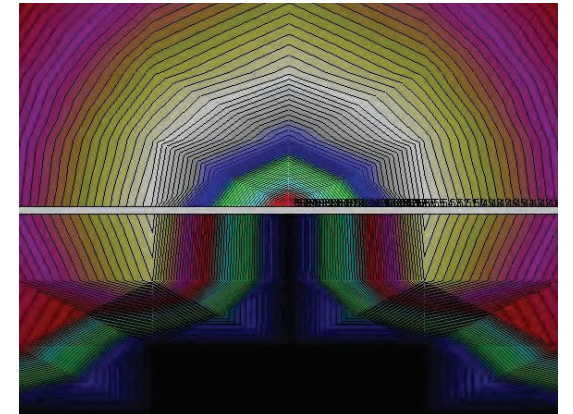
Aaron Bessant Amphitheater is an outdoor performance space located in the center of Pier Park, a park with walking trails and a war memorial adjacent to a major shopping area and the Gulf of Mexico in Panama City Beach. The amphitheater is used to bring in a variety of regional and national talent who perform rock, country and popular amplified music as well as smaller local groups who perform reinforced or natural acoustic pieces. The Gulf of Mexico is located to the south of the site. There are residential neighborhoods that surround the amphitheater. The amphitheater consists of a 60'x40' stage with an 8' thrust out front increasing the stage area considerably. Siebein Associates was involved from the beginning of the planning process of the amphitheater by performing an environmental acoustic study to determine the potential acoustic impact the amphitheater would have on the community and to promote soundscape compatibility planning concepts in the basic design of the facility.

Acoustical modeling and analysis was performed to determine the most suitable orientation on the site for the amphitheater to optimize acoustical compatibility and reduce noise spill to the neighboring residences.

Acoustical measurements were made in the various communities surrounding the amphitheater to document ambient sound levels, so as to compare them with projected sound levels during events.

Siebein Associates also designed the acoustic finishes in the amphitheater, including strategically placed sound absorbing material on the inside of the enclosure to reduce reflections from monitor loudspeakers and carefully design overhead reflectors to propagate natural sound evenly across the audience seating area. The firm also designed the sound system, including the house speaker system that was seamlessly integrated with the architectural design of the facility. The sound system has the flexibility for performers to plug their own gear and speakers into if necessary.

Gary Siebein participated in many stakeholder meetings with city officials and the public, presented his findings at these meetings and participated in “Question and Answer” sessions to educate the public on the ways that the acoustic issues of the project were resolved in the final design. Siebein Associates also devised a sound management plan, where sound levels could be measured in the surrounding neighborhoods during events, and sound levels could be adjusted to ensure the amplified music stayed within noise ordinance limits.



Amphitheater Noise Impact Analysis

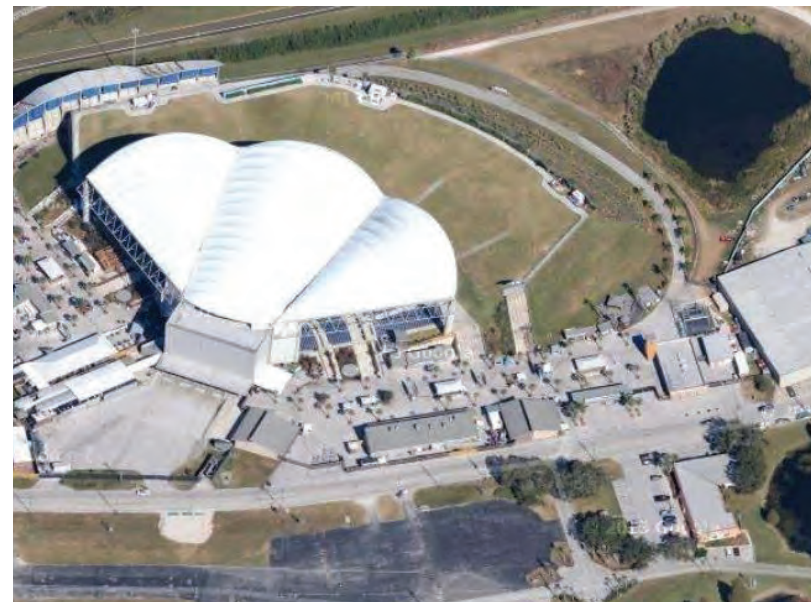
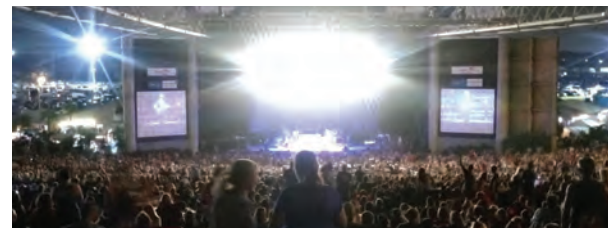
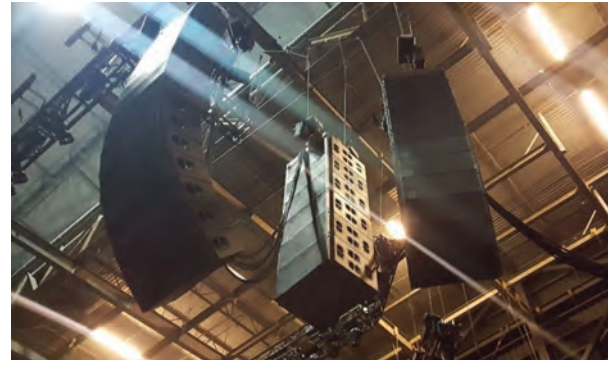
Tampa, FL

Amplified rock concerts at a 20,000 seat amphitheater in Tampa, Florida were disturbing residents up to 4 miles away. Siebein Associates assisted the Hillsborough County Environmental Protection Commission and their technical and legal staffs in a number of legal actions against the amphitheater operator to enforce the existing County Noise Ordinance and reach a settlement agreement between the City and the amphitheater.

Work on the case involved sophisticated acoustical monitoring of multiple events at the amphitheater, data analysis, meetings with neighborhood groups regarding noise complaints, meetings with City, EPC and legal staff, City Commissioners and others involved with the case, as well as expert testimony at a number of public hearings and court hearings and trials. Aural simulations of projected noise levels were extensively used in the public hearings and court testimony.

Aural simulations involve calibrated, high resolution recording of the sounds heard in residents' yards and homes. The recorded sounds were digitally processed to simulate the sounds that violated the noise ordinance as they were heard and at levels adjusted to simulate the sounds as they would be heard at various sound levels proposed by different parties in the settlement agreement calibrated in the court room and commission chamber to actual levels that would be heard at specific locations in the neighborhood.

The use of this technology allowed the judge, legal staff, citizens and others to hear how the proposed ordinance revisions would sound as opposed to just discussing decibel levels as abstract quantities. A three part noise mitigation plan was proposed involving infrastructure improvements, administrative controls and audio system controls.



Daytona Beach Bike Week Noise Impact Analysis

Daytona Beach, FL

A large number of residents in Daytona Beach have become concerned about the growth of Bike Week activities. The Chamber of Commerce, the City and a number of stake holder groups supported a noise study of Bike Week activities that included measurement of sounds at multiple locations throughout the City during Bike Week and during a month when there were no special events.

Bike Week activities include the millions of people riding motorcycles through City streets, amplified music from entertainment establishments, amplified speech from commercial establishments announcing events in their venues, noise associated with large numbers of people congregating in public streets, parks and other areas as well as the normal day-to-day sounds of the community.

A multi-component noise mitigation plan was developed in conjunction with the City and Chamber of Commerce and other stake holder groups that included long term education and awareness programs to increase bikers awareness of the noise problems perceived by residents and methods to reduce noise disturbances; traffic planning to reduce the number of motorcycles driving unnecessarily through residential areas; sound level limits for amplified music production for clubs; law enforcement protocols for noise enforcement; and other items to strike a reasonable balance between the visitors, commercial establishments and residents. Siebein Associates presented testimony at a number of workshops and public hearings in support of the noise mitigation plan that was implemented.



Noise Impact Study for the Blue Ribbon Committee on Deep Bass Thumping Noise Sarasota, FL

Citizens in the City of Sarasota raised concerns to the City Commission that noise propagating from a number of entertainment establishments was creating disturbances in their homes particularly late at night. Law enforcement officers generally found that the sounds complied with the existing noise ordinance, but still resulted in numerous and vigorous complaints from residents.

The noise problems were largely caused by propagation of “deep, bass, thumping sounds” from amplified music played in indoor, partially enclosed and outdoor entertainment venues. The existing City Noise Ordinance contained provisions to use the A-weighted decibel (dBA) scale to measure compliance. Large amounts of low frequency or bass sound energy is subtracted from the overall sound levels when the A-weighting filter is applied. Therefore, even though the low frequency (or bass) sounds could be heard as a series of “deep bass thumps” inside homes located at large distances from the entertainment establishments, the establishments complied with the current law and no remedial action could be taken by the City.

The Mayor established a Blue Ribbon Committee to study the issue, engage consultants and develop proposals to revise the law and ease tensions between residents and commercial establishments.

Siebein Associates, Inc. was engaged after several other consultants had worked on the project and failed to satisfactorily resolve the situation. Detailed measurements were taken throughout the community to document quantitative and qualitative aspects of the soundscape or acoustical environment in the different districts of the city. Meetings were held with various stake holder groups including politicians, law enforcement officers, night club owners, various residential groups and home owners associations to document the complex acoustical concerns that were involved.

A series of experiments were conducted where amplified music was played at controlled levels from clubs and measured simultaneously at the club and inside peoples’ homes to document the effect that different music sound levels had at various locations in the community. Recommendations for improvements to the infrastructure of the clubs, allowable sound levels and audio system controls were presented to the City.



The Leslie Hotel Rooftop Terrace Acoustic Assessment Miami Beach, FL

As part of a planned renovation of the historic Leslie Hotel, the owner proposed to add a rooftop terrace and pool for guests of the hotel.

Siebein Associates, Inc., was hired by the City of Miami Beach to conduct a study of potential noise impacts from this type of rooftop use on The Islander Condominium building located immediately to the northeast of The Leslie, and to propose noise reduction strategies to reduce off-site noise propagation.

Acoustical measurements of ambient sound levels on the balcony of an upper level Islander Condo Unit overlooking The Leslie Rooftop were made each minute over a one week period to quantify the existing range of typical sound levels at the Islander Condo throughout the day and night.

Computer models were developed to estimate the sound level at The Islander from potential noise sources on The Leslie Hotel roof terraces as currently designed and with various noise mitigation options. The firm worked with the City of Miami Beach Planning Department and the Applicant to respond to various uses considered for the roof terraces. Recommendations for reducing the noise from proposed activities at the roof terraces, as well as a summary of potential sound levels at The Islander were provided in a report submitted to the Historic Preservation Board.



Sarasota Memorial Hospital Central Energy Plant
Sarasota, Florida



“Not in My Back Yard!”

When neighboring residents of Sarasota Memorial Hospital discovered that the existing Central Energy Plant (CEP) on the “far” side of the Hospital was to be demolished and replaced with a new, larger Central Energy Plant located immediately adjacent to their neighborhood, they quickly mobilized to protest the change. They formed a community action committee and established “Stop the Power Plant.com” website. One of their primary concerns was potential noise emissions from the large cooling towers, emergency generators, chillers, and boilers that would be housed at the Plant. Siebein Associates, Inc., was engaged early in the process to meet with concerned citizens, present the scientific basis for design solutions that would meet the “net zero” noise impacts required by the hospital, work with the Architect and Engineers to design the Plant, and conduct compliance measurements upon completion of the plant.

“Getting Everyone on the Same Page”

Early sentiment among residents was one of skepticism. They didn’t believe that a CEP of this magnitude could be built so close without a noise impact. Siebein Associates conducted a series of workshops in concert with the Architect, Engineers, Hospital Staff and Residents while simultaneously undertaking a large scale Environmental Acoustical Assessment (EAA) of the existing ambient sound conditions in the neighborhood. The EAA consisted of taking short term acoustical measurements of ambient sound levels at more than 20 locations spanning a 14 block area in and around the Hospital, long term measurements of ambient sounds at four key receptor locations, recording high resolution ambient sounds in the neighborhood, and recordings of cooling tower sounds at a similar energy plant at a hospital in Charlotte, North Carolina.

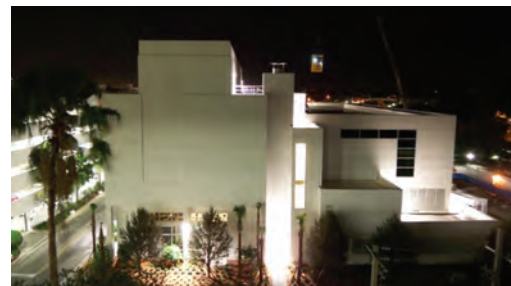
The potential noise impacts of several alternative design options and noise mitigation strategies for the cooling towers were modeled. A presentation to the residents that included estimated cooling tower sounds in the presence of ambient neighborhood sounds played through loudspeakers in an auditorium was well received. This presentation led to requests for a “real life” demonstration in the neighborhood, as well as demands for even lower noise levels. Custom noise mitigation solutions for the cooling towers and other equipment were developed and the results were presented to the neighborhood in the form of actual cooling tower sounds broadcast through 16 loudspeakers located at the top of the a parking garage adjacent to the future site of the Plant, at the levels they would actually be heard (or not heard) in the neighborhood. This allowed residents to walk around their neighborhood all day and night over a four day period as ambient sounds changed, and listen for noise impacts from the simulated Plant. This type of “soundscape” method allowed the evaluation of the “net zero” noise impacts to occur by residents. The soundscape workshops served as a vehicle to develop productive relationships between the hospital, design team, city and neighbors. Convinced that the resulting cooling tower sounds, or lack thereof, were acceptable, the residents and the City of Sarasota gave their approval and the project was able to move forward with the design and construction of the Plant at the preferred site.

“Down to The Nitty-Gritty”

With the project approvals behind them, Siebein Associates was then able to focus on developing the designs, details, and acoustical performance specifications necessary to meet the “net zero” noise impacts required by the Hospital. A transparent process that allowed the community groups to review design proposals, acoustical measurement results, and specification language developed by the team kept the project moving forward while maintaining positive community relations. The firm worked intensely with the Mechanical Engineer and equipment manufacturers to develop custom solutions including 120 ft wide x 20 ft high x 13 ft long banks of industrial silencers at the intake and discharge of the generators, acoustical plenums and banks of silencers to reduce transformer exhaust fan noise, and acoustical performance specifications for the cooling towers that assigned responsibility for the resulting sound levels to the equipment manufacturer. This also including a written guarantee from the cooling tower manufacturer to meet strict octave band sound levels at a distance of 50 ft from the top of the cooling towers. These efforts resulted in a final design that met the architectural, mechanical and acoustical goals of the project.

“How’s the Weather Up There?”

Conducting acoustical measurements hanging from the end of a crane 100 ft above the ground at 3 o’clock in the morning is not an everyday event, but was necessary to determine compliance of the cooling tower sound levels with the project specifications. Siebein Associates had to conduct these measurements above the cooling tower, as the sound levels of the cooling tower at grade level would be too quiet to measure in the presence of the typical ambient. Due to tightly written acoustical performance specifications and the written guarantee from the manufacturer, deviations from the sound level requirements are being addressed by the cooling tower manufacturer through the implementation of additional noise mitigation elements to the towers.



Mease Countryside Hospital Central Utility Plant Replacement Project
Safety Harbor, Florida

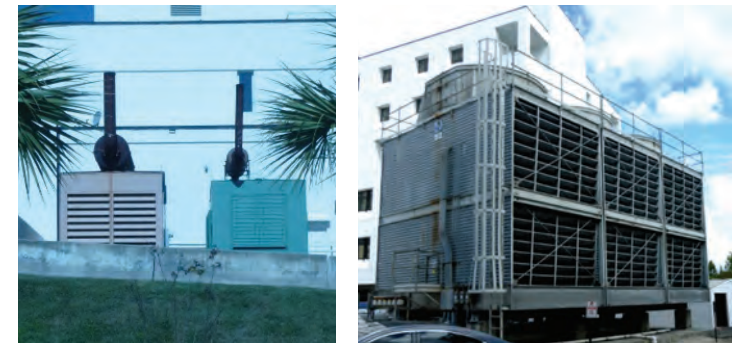
Siebein Associates provided a preliminary concept narrative of the acoustical requirements for the new Central Utility Plant at the Mease Countryside Hospital in Safety Harbor, Florida including acoustical recommendations for cooling towers, emergency generators, pump/boiler/chiller rooms and vibration isolation of equipment.

Our consultants held a design charette with stakeholders to address Safety Harbor and Pinellas County noise ordinances, prioritization of CUP noise sources, tools for reducing central utility plant noise, and case studies of similar projects.

Siebein Associates conducted an environmental acoustic assessment of the existing hospital and the sound levels that existed at the nearest residential and commercial property lines to the south and east of the site and provided acoustical design recommendations for the proposed new central utility plant (CUP).

A computer model was developed using preliminary sound source acoustical data for the CUP equipment. The effects of distance, topography, and vegetation were included in the computer model to arrive at estimated sound levels in the community due to the CUP and preliminary noise mitigation strategies to meet several alternative design criteria.

Siebein Associates conducted acoustical testing of the CUP equipment and provided acoustical analysis and recommendations for noise mitigation for mechanical equipment to meet the quantitative sound level limits of the Pinellas County Noise Ordinance.



Selected Project Experience with Regulatory, Contractual and Jurisdictional Matters

EXPERT WITNESS

2800 SE Dune Drive Condominium Association vs. Sailfish Point Inc., Hutchinson Island, Florida
Barring Industries vs. Spector Construction Co., Miami, Florida
Bayview at Fisher Island vs. Crystal Spring Miami, Florida
Borrelli vs. Key Biscayne Ocean Club Limited Partnership Key Biscayne, Florida
Braun vs. Siegel FIIC Testing, Fort Lauderdale, Florida
Ford Amphitheater Noise Impact Study (Environmental Protection Commission of Hillsborough County vs. CC Entertainment Music Florida State Fair Authority) Tampa, Florida
Fox (Club Tower) vs. Sachtler Management, Miami, Florida
GL Homes Davie Construction Noise Ordinance Study Coral Springs, Florida
Juan de Leon vs. Comcar Industries, Inc., Tampa, Florida
Manatee County Airport Overlay Professional Qualifications Review, Manatee County, Florida
Manatee County Teco Arena Noise Impact Review, Manatee County, Florida
Manatee County Wal Mart Supercenter Noise Impact Study (I & II), Manatee County, Florida
Oneil vs. Levy County, Williston, Florida
Sarabande Condominium, Saint Petersburg, Florida
Sawyer Condominium, Asheville, North Carolina
Schroering & Gatson vs. Clear Channel (Case No. 05-04330) Tampa, Florida
Slavis Residence Acoustical Review of Floor Underlayment Materials, Fort Lauderdale, Florida
Sysco Food Distribution Professional Qualifications Review Alachua, Florida
Trout vs. Zivitz, Longboat Key, Florida

NOISE ORDINANCE DEVELOPMENT

Center Place, Fort Myers, Florida
Chesapeake Noise Ordinance Acoustical Review of Proposed Changes, Chesapeake, Virginia
Dunedin Noise Ordinance Development, Dunedin, Florida
Remerton Noise Ordinance Acoustical Issues, Remerton, Georgia
Lake County Acoustical Issues, Lake County, Florida
Daytona Beach Noise Amendment Review, Daytona Beach, Florida
Hilton Head Noise Ordinance, Hilton Head, South Carolina
Lake County Community Noise Assessment, Lake County, Florida
Manatee Civic Center, Manatee County, Florida
Manatee County Development Stipulation, Manatee County, Florida
Manatee County Noise Ordinance, Manatee County, Florida
Manatee County Noise Ordinance Review 2006, Manatee County, Florida
Manatee County Road Noise Stipulation, Manatee County, Florida
Sarasota County Noise Ordinance and Bass Noise Ordinance, Florida
Ritz Carlton Noise Ordinance Revision Review, Key Biscayne, Florida
Mount Dora Noise Ordinance Revision, Florida
Sarasota City Ordinance Review for Amplified Music, Sarasota, Florida
South Daytona Beach City Noise Ordinance Study, Daytona Beach, Florida
Ybor City Noise Ordinance, Ybor City, Florida

ENVIRONMENTAL NOISE IMPACT STUDIES

Anderson Raceway Park Noise Study, Palmetto, Florida
Georgia Motorcross Practice Facility, Cairo, Georgia
Blalock Lakes Clay Pigeon Range Noise Study, Blalock, Georgia
Bonner Property Train Noise Impact Study, Sanford, Florida
Century Plaza Environmental Acoustic Assessment, Miami, Florida
City of Chesapeake Holy Ministries Environmental Noise Study, Chesapeake, Virginia

Commons Town Center Noise Impact Study, Davie, Florida
Crystal Lake Water Park Noise Study, Deerfield Beach, Florida
Florida Hospital Generating Plant, Orlando, Florida
Flower's Bread Shop Noise Impact Study, Gainesville, Florida
Georgia Motocross Practice Facility Noise Measurements, Cairo, Georgia
GL Homes Greystone HUD Noise Assessment, Naples, Florida
GL Homes Mecca Dubois and Voustas, Palm Beach, Florida
GL Homes Mini Assemblage Traffic Noise Study, Palm Beach, Florida
Jehovah's Witness Kingdom Hall Expansion Environmental Acoustic Assessment, Naples, Florida
Lake Nona Noise Study, Orlando, Florida
LandMar Cargor Traffic Noise Study, Manatee County, Florida
Maitland Auto Repair Shop Noise Impact Study, Maitland, Florida
Manatee County Creekwood Parcel D Acoustical Review Comments, Manatee County, Florida
Mynt Entertainment Noise Study, Miami Beach, Florida
Park Place Town Center Environmental Acoustic Assessment, Sarasota, Florida
Riva Trace Traffic Noise Study, Manatee County, Florida
River Club Park Environmental Acoustic Assessment, Bradenton, Florida
Sweetwater Preserve Environmental Acoustic Assessment, Bradenton, Florida
Village Partners HUD Traffic Noise Assessment I4 - US27, Davenport, Florida
WCI Old Palm Golf Club Traffic Noise Impact Study, Palm Beach, Florida
West Kendall Baptist Hospital Environmental Acoustic Assessment, Miami, Florida

INDUSTRIAL NOISE IMPACT STUDIES

Alachua Partners Concrete Plant Noise Impact Review, Alachua, Florida
Bellsouth Emergency Generators, Boca Raton, Florida
Bellsouth Emergency Generators, Fort Lauderdale, Florida
Environmental Focus Technology, Tampa, Florida
Exactech Manufacturing, Inc., Gainesville, Florida
Flower's Bread Shop Noise Impact Study, Gainesville, Florida
Hellman USA Headquarters Noise Impact Study, Miami, Florida
Honeywell Facility, Mexicali, Mexico
Main Recycling Facility, Jacksonville, Florida
M & N Plastics Environmental Study, Plant City, Florida
Naples Daily News Noise Study, Naples, Florida
Nestle Water Plant, Madison, Florida
Peele-Dixie Membrane Plant Pump, Ft. Lauderdale, Florida
Plantation East Water Treatment Plant Noise Evaluation, Plantation, Florida
Rayonier Fernandina Mill Environmental Acoustic Assessment, Fernandina Beach, Florida
Ray's Plumbing & Mechanical Contractors, Jacksonville, Florida
Ring Power CAT Isolation, Jacksonville, Florida
Saw Mill Noise Measurements, Anthony, Florida
Sebastian Stormwater Pump Station Noise Control, Sebastian, Florida
Shands/Alachua General Hospital Generators, Gainesville, Florida
Tiera Del Sol Pumping Station, The Villages, Florida
Trinity Materials Concrete Batch Plant, Alachua, Florida
Village Daily Sun, The Villages, Florida
Watco Company Railcar Repair Facility, Jacksonville, Florida
Williston Pine Shaving Plant, Williston, Florida



Chiller plant full-scale acoustic simulation in a quiet neighborhood

Marylin Roa, Matthew Vetterick and Gary W. Siebein

Siebein Associates, Gainesville, FL, USA

ABSTRACT

In the field of architectural acoustics, one collaborates with a community in order to maintain a defined soundscape in a growing city. This visual essay presents dialogues between designers and stakeholders with the acoustical consultant during the design of a new chiller plant at a college in a medium-sized city. In order to understand the noise impact of the proposed chiller plant equipment on the quality of life, which resulted in sound levels greater than measured ambient sound levels of the community, a full-scale simulation was constructed to help the community make decisions on which noise mitigation strategy should be used to maintain the existing sounds of the site.

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Introduction

R. Murray Schafer, who defined the concept of soundscape as the link between people and sounds in their environment, has stated that the environment in which we live in is like an orchestra directed by its composer to celebrate the sounds that result from the activities that people engage in during each day (Schafer 1977). Soundscape, according to ISO 12913–1, is an acoustic environment experienced and/or understood by a person or groups of individuals gathering in its context. This definition, released for the first time in the year 2014, also provided a link between users and the physical attributes of their environment as elements that may be measured and analysed. The acoustical environment includes the modification of sounds as they propagate from their source to the receiver (Brown *et al.* 2016). Different from conventional noise control, soundscape research considers sound environments, society, human beings, and the ear (Kang 2017). Soundwalks, according to ISO 12913–2 (2014), are a method that implies a walk in an area with a focus on listening to the acoustical environment, or soundscape, to obtain human responses from a participatory group. The interdisciplinarity of the various stakeholders and planners is a necessity (Shulte-Fortkamp 2018) as part of the participatory group. Recent advances in visual and aural simulation technology allow the qualities of the spaces to be consciously designed and evaluated by an engaged citizenry as part of the design and development process (Siebein *et al.* 2006). The idea of an acoustic calendar or rhythms occur for each of the sound cycles and activity cycles for each of the participants that usually result in some variations of sounds and

activities over a diurnal, monthly, yearly or other cycle. Due to this, the acoustic environment should be studied at varied times throughout this calendar. Brown, Gjestland, and Dubois agree that the sounds in an environment ‘vary from instant to instant, from day to night, and from season to season’ (Brown *et al.* 2016). Therefore, an acoustic calendar can be developed for each participant or representative group of participants in an acoustic community, for each acoustic itinerary or for each acoustic room for a given period of time (Siebein *et al.* 2006). This paper presents acoustical design methods that follow a systemized method to obtain and analyse a quiet neighbourhood where a college plans to build a central energy plant desired to serve its growing campus. Initial acoustical analysis of the proposed chiller plant equipment showed that the chiller plant would result in sound levels greater than the measured ambient sound levels of the surrounding area. Therefore, in order to understand its impact on the quality of life, a full-scale simulation of the chiller plant was constructed in order to enable the community and help them make decisions to maintain the existing sounds of the site.

Method

At the beginning of the design process, the acoustical consultant was engaged to determine if the resulting noise level of the proposed equipment for the chiller plant will meet the city’s noise ordinance. This collaboration allowed for the early discovery of the acoustical effect that the initial selection of equipment and building construction assemblies had on the proposed site location. The

initial noise study for the new chiller plant consisted of three primary tasks:

- (1) Conduct acoustical measurements on site to document the existing sound levels in the area surrounding the proposed chiller plant site.
- (2) Analyse the proposed mechanical equipment including the cooling towers, chillers, pumps and other equipment to estimate sound levels at the property lines from operation of the equipment and determine if the proposed chiller plant meets the required sound level limits of the noise ordinance having jurisdiction.
- (3) Design concept noise mitigation systems for the equipment with the design team to meet the noise ordinance requirements at the property line.

Defining the acoustic environment of the proposed site

Two locations on the proposed site were selected for long-term and short-term acoustical measurements of specific acoustic events. The locations were selected to record the acoustical conditions of the four primary sound sources that were observed to make up the soundscape of the site: light traffic on nearby roadways, quiet periods consisting of wind blowing in the vegetation, insects, and sounds from distant traffic on a nearby major highway (Figure 1). A Day-Night Average Sound

Level or LDN is a metric used to give an overall characterization of the noise environment on the site. The average of the recorded sounds made during the daytime hours from 7:00 a.m. until 10 p.m. and the average of the sounds made during the night time hours from 10:00 p.m. until 7:00 a.m. with a 10 dB penalty added to them, varied between 48 and 53 dBA which is typical of a quiet urban area. The specific night-time acoustical measurements showed that sound levels varied from 31 to 45 dBA. Determining the specific sound levels of the proposed site at a specific time, showed that the construction of a chiller plant would likely add audible mechanical sounds which would negatively impact the psychological well-being of the existing neighbours (Figure 2). The addition of new low-frequency content due to operation of the pumps, chillers and cooling towers would be heard above the typical ambient sounds that already define the site at night. Concerns about night time sound levels were expressed because the chiller plant is an ice storage facility that operates mainly at night to take advantage of off-peak electrical costs and because many people sleep with their windows open during the Fall, Spring, and Winter months due to the moderate climate.

Design strategies to meet the noise ordinance vs being good neighbours

An acoustical analysis of the sound level data provided by the design team for the chiller plant equipment including the cooling towers, chillers

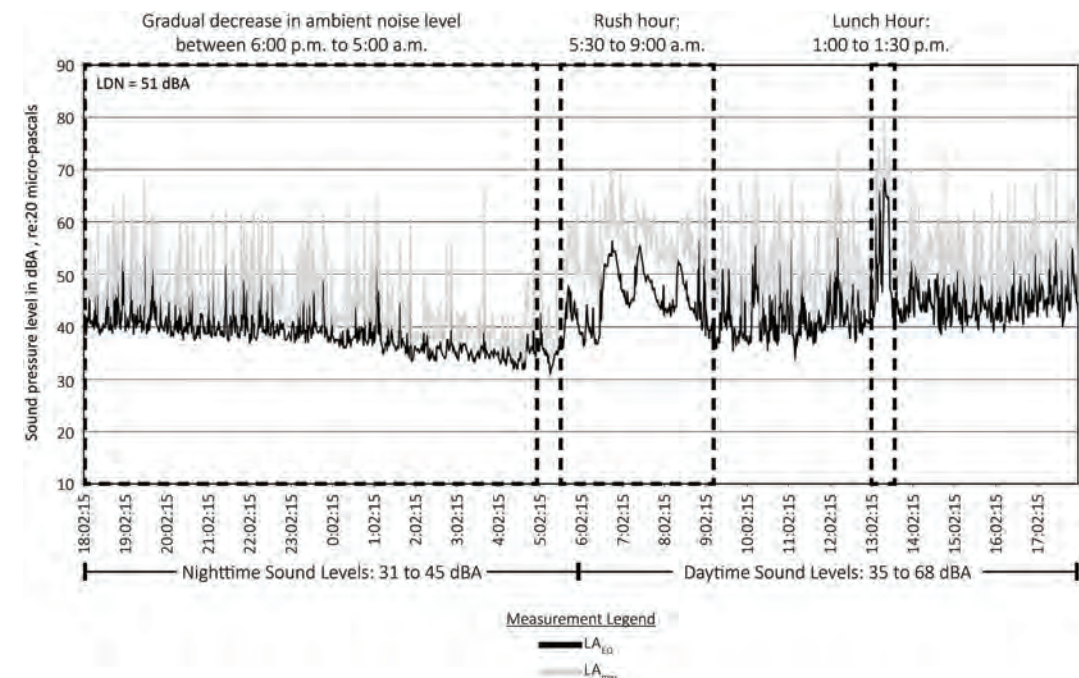


Figure 1. Graph showing sound levels measured during one of the seven days at location R1 (Acoustical events that define character of the site are shown inside a dashed box).



Figure 2. Sound contour map showing that the noise generated from the proposed chiller plant exceeds the city's noise ordinance (75 dBA) and measured ambient sound levels (locations R1 and R2). The computer model included five cooling towers within a sound-absorbing enclosure; the chiller building consisted of a concrete roof, CMU walls, regular roll-up doors, typical man doors, three chillers and six pumps, and interior sound-absorbing material.

and pumps showed that upgrades to the building construction assemblies and quieter equipment would be needed to meet the required sound level limits in the noise ordinance or a different site selected that did not have noise-sensitive properties adjoining it. If the chiller plant was located on the initial proposed site, its sound levels would be heard more than 4 times louder than the existing ambient sound levels at night. The local noise ordinance allows sounds at residential receiving property lines to be up to 75 dBA and 75 dBC during night time hours and 75 dBA and 80 dBC during day time hours; however, sound walks and long-term acoustical measurements made in the neighbourhood around the proposed site as well as the three alternate sites showed that the existing ambient sound levels

were far below the maximum allowable sound level limits stated in the ordinance. From an acoustical point-of-view, the three alternate sites allowed for the construction of a chiller plant met the sound level limits of the noise ordinance with minimal upgrades. However, consideration given to costs as well as to the layout of the existing and future piping network that serves the college resulted in the selection of the original site as the location of the Chiller Plant (Figure 3).

The sound mitigation systems included a solid wall barrier extending 5 ft. above the top of the cooling towers with quiet fans, the addition of sound-absorbing material on the walls and ceiling of the chiller building, durable sound-absorbing material on the inside face of the cooling tower well, acoustically rated roll-up doors, and sound

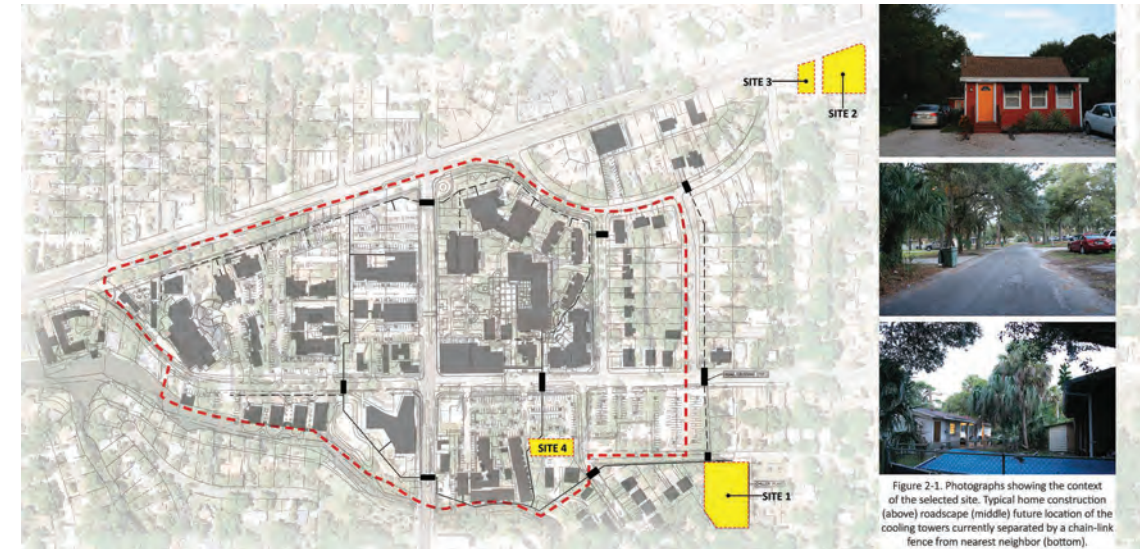


Figure 3. Site plan showing locations of various sites that were considered by the Architect and Client in an attempt to minimize noise impact to neighboring properties. Site 1, the original project site, remained as the project site after the site selection study was conducted because of its central location to existing and future piping network. Site 2 would consist of retrofitting an existing building adjacent to an Art Studio; Site 3 is a parking lot adjacent to an attorney's office; Site 4 is currently a parking lot within the college and is prime land for future expansion.

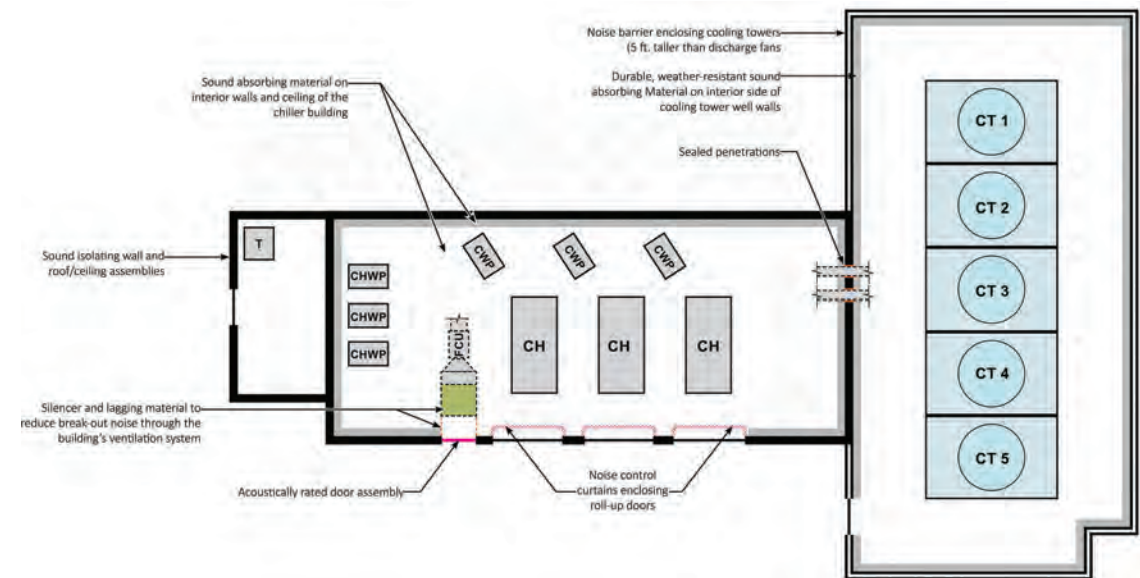


Figure 4. Floor plan of the proposed chiller plant indication the locations and types of acoustical interventions designed to reduce off-site noise propagation. There are five cooling towers (CT) in a sound-absorbing enclosure that extends 5 ft. above the top of the discharge fans. There are three chillers (CH), six pumps (CHWP and CWP), one transformer (T), and a fan coil unit (FCU) inside the chiller building.

attenuators at louver openings (Figure 4). The study showed that the resulting sound level from the chiller plant with the sound mitigation systems met the noise ordinance but was 15 to 30 dB higher than typical night time sound levels because most of the noise was produced by the cooling towers located outside of the chiller building and 30 ft. away from the nearest noise sensitive receiver.

As a result, the Client posed a very important question: 'What do we need to do to be good neighbors?' The College understands that the growth of its students depends on access to clear and intelligible dialogues amongst each other and with its staff. In the same manner, the College understood that additional measures were needed to design a Chiller Plant that is compatible with the fabric of the low key, traditional, residential neighborhood near the College.

What does 50 dBA sound like?

The Mechanical Engineer proposed three alternate cooling tower schemes for the Acoustical Consultant to determine potential noise impacts on the adjacent properties. Scheme 1 (Figure 5) consisted of the basis of the design cooling towers with the manufacturer's quiet fans with 10 ft fans containing six blades operating at a fan motor speed of 1200 rpm and 30 BHP fan motors per cell; Scheme 2 (Figure 6) consisted of cooling towers with the manufacturer's ultra-quiet fans with 12 ft fans containing four blades operating at a fan motor speed of 1104 rpm and 20 BHP fan motors per cell with a wide chord blade design which is resiliently mounted to the hub, and Scheme 3 (Figure 7) consisted of the cooling towers with the manufacturer's quiet fans with vertically mounted,

low-pressure loss silencers on the discharge side of the cooling towers in combination with a plenum between the fan and the silencers. Noise contour plots for each scheme were presented to the Client, the Architect and the Mechanical Engineer. Scheme 1 resulted in sound levels of 55 to 60 dBA at that property line, scheme 2 resulted in sound levels of 50 to 55 dBA and scheme three resulted in sound levels of 45 to 50 dBA at the property line. All three schemes meet the project's noise ordinance criteria. However, there were still some doubts as to which scheme to select because it was difficult to determine the perceptual aspects of sounds as they would be heard in the neighborhood. The Client was very interested in understanding which scheme resulted in a Chiller Plant that was more in tune with the

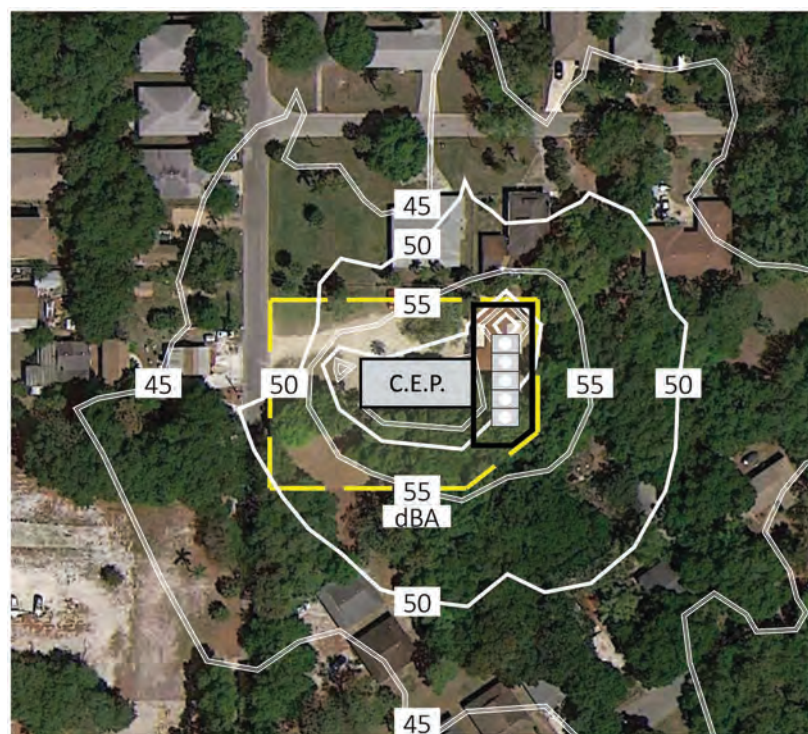


Figure 5. The noise contour plot (above) shows the resulting noise contours for the chiller plant equipment and the basis of design cooling tower selection (scheme 1).

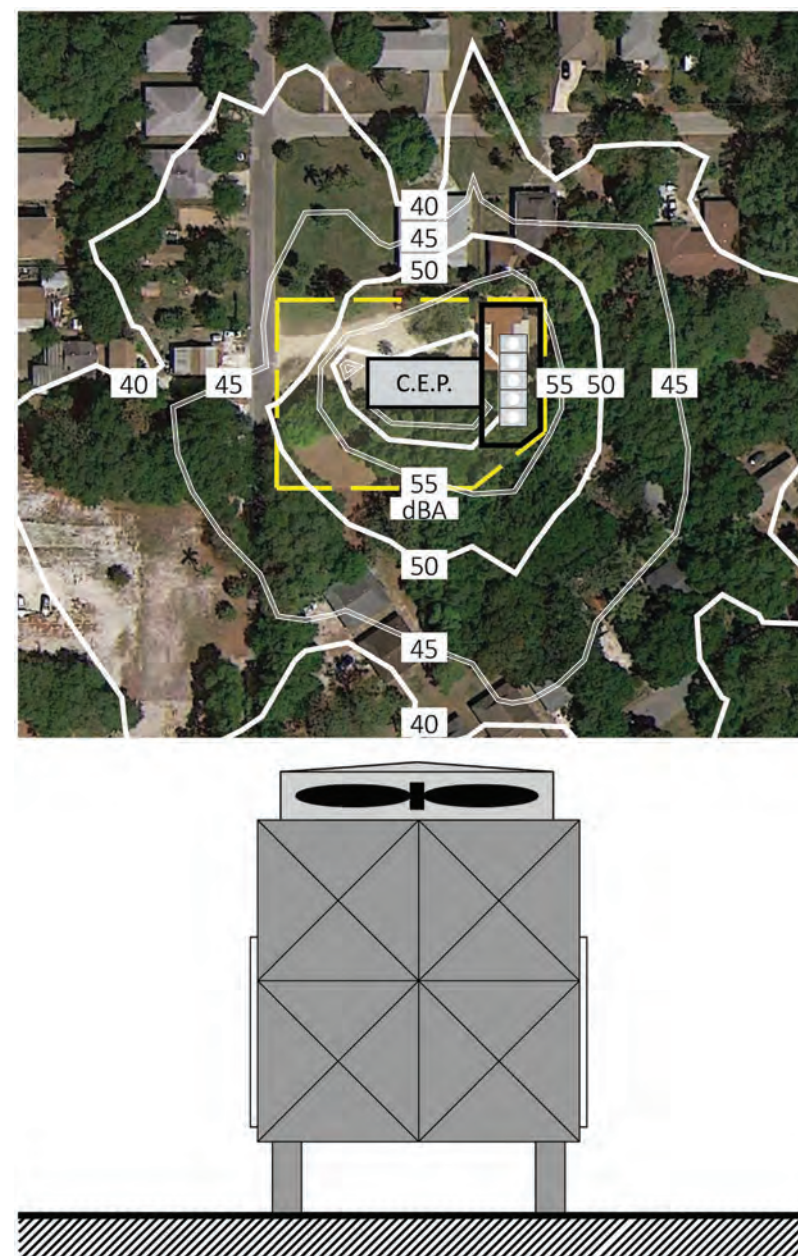


Figure 6. The noise contour plot (above) shows the resulting noise contours for the chiller plant equipment and cooling towers with ultra-quiet fans (scheme 2).

typical ambient sounds of the site. The way that the time and frequency or pitch of the chiller plant sounds would be heard in the midst of the ambient could not be understood from the numerical data presented. Therefore, the design team agreed to create a calibrated full-scale simulation of the chiller plant that would be played for periods of time on the actual site for each noise mitigation option in order to determine which schemes fit within the character of the existing ambient sounds of the site. This way project stakeholders could walk around the neighbourhood and hear the sounds of the chiller plant noise mitigation options in the backyards and in the streets as they went about their normal daily activities.

Preparing for a simulation

A full-scale simulation of the Chiller Plant allowed for the design team to walk through the neighbourhood and hear the sounds as they would be heard after completion of the chiller plant. Audio recordings of the source sounds had to be made at a chiller plant with similar equipment to that proposed for this project. The equipment vendor assisted in locating a similar existing facility. Acoustical measurements and wave file recordings were made at the existing chiller plant of sounds at the top of the cooling towers where the fan noise predominates (Figure 8), at the sides of the towers where water noise dominates (Figure 9), inside the chiller plant next to the chillers and pumps (Figure 10), and outside the large

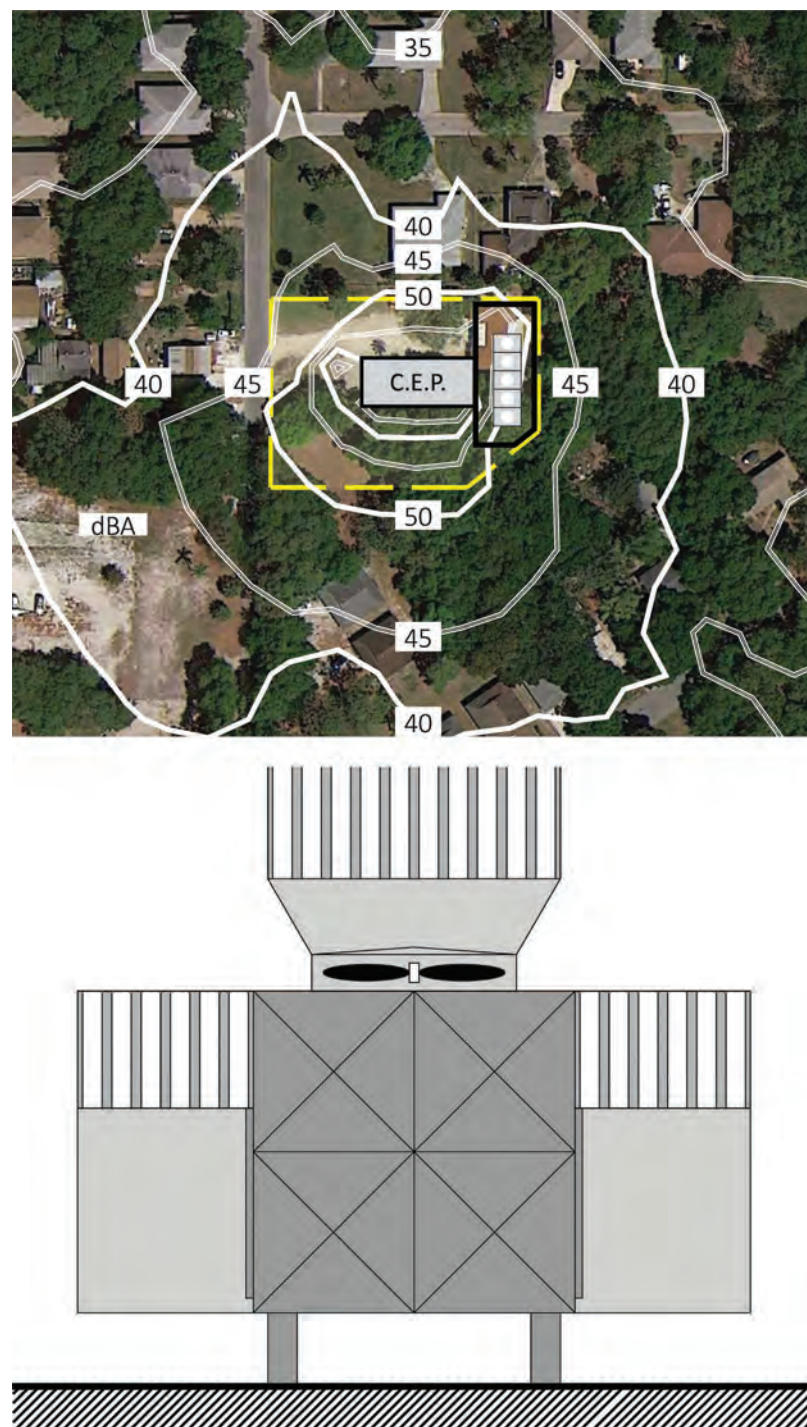


Figure 7. The noise contour plot (above) shows the resulting noise contours for the chiller plant equipment and the basis of design cooling tower selection (scheme 1).

doors of the enclosed chiller plant where the sounds of the chillers and pumps with their associated tones propagate (Figure 11). Using Audacity, a multi-track audio editing software, the recorded audio tracks were equalized in 1/3 octave bands to the resulting sound level spectrum of the computer model generated with CadnaA, which is a state-of-the-art noise propagation modeling software, to replicate the resulting low, mid and high frequency response and the overall loudness of the sounds propagating from the proposed mechanical equipment inside the chiller building of the chiller

facility. The calibrated audio track was stored and saved in a CD. An array of full-range loudspeakers and subwoofers was designed so that the loudspeakers could be located near grade level at the proposed site while simulating sound propagation from a combination of sound sources propagating from different heights and locations on the site through the neighbourhood matching the resulting noise contour plots for each scheme.

At the time of the simulation, buildings existed in locations on the site that would be demolished as part of the construction process. Sounds from



Figure 8. Acoustical measurements and recordings of the cooling tower fans taken at an existing facility similar to the proposed central energy plant.



Figure 9. Acoustical measurements and recordings taken of the air intake sides of the cooling towers at an existing facility similar to the proposed central energy plant.



Figure 10. Acoustical measurements and recordings of the chillers and pumps inside an existing facility similar to the proposed central energy plant.



Figure 11. Acoustical measurements and recordings of sound propagating through the roll-up doors at an existing facility similar to the proposed central energy plant.

the loudspeakers had to propagate into the neighbourhood as though the buildings were not located there and sounds could freely propagate into the neighbouring lots. Therefore, in order to equalize the sound level of the audio tracks playing through the loudspeakers, a Larson Davis model 831, Type 1 integrating sound level meter, was used to compare the sound pressure level in each one-third octave band to the sound level spectrum generated with the computer model between 100 and 10,000 Hz. The sound level of the loudspeakers, at each one-third octave band, were calibrated to be within ± 3 dB from the resulting sound level of the sound propagation model developed in CadnaA.

Simulation

Once the sound system was set up and calibrated three soundwalks (Figure 12) were conducted with a listening jury consisting of the Trustees and the Vice President of Facilities for the college, college staff, and other stakeholders to listen to the simulated sounds. The first (Figure 13) soundwalk occurred at approximately 3:00 p.m. A second sound walk (Figure 14) was held at approximately 8:00 p.m. and again at 3:00 a.m. the following morning (Figure 15). The reason for the late night and early morning sound walks was that as the background sounds from traffic and insects decrease in the late night and early morning hours, it was important to experience the soundscape of the neighbourhood with and without the simulated sounds from the proposed chiller plant. Fourteen specific locations were established at which the jury would stop and listen for a period of time. Sounds for each of the three schemes were played for several minutes each so the jury could listen. Jury members could communicate with the sound system operator to replay tracks if desired, play them for longer periods of time or play them so A/B or A/B/C comparisons could be made at each location. The jury discussed what they heard at each point. The jury decided that they preferred a narrative discussion and debriefing as the method to evaluate the sounds rather than a questionnaire or a numerical scale. The listening jury decided that the relative differences of the loudness of the schemes was clearly heard to decrease from Scheme 1 to Scheme 3 as more noise mitigation was added to the chiller plant. It was also decided that Scheme 2 could meet the project goals of being significantly quieter than the 75 dBA allowed by the noise ordinance and approaching the vicinity of the existing background sounds at the site at most locations especially those more than 1/2 block away from the chiller plant. The consensus of the jury was that the simulation was much easier to understand than the numerical



Figure 12. Aerial map showing the path (dashed line) taken during the simulation of the chiller plant. The location of the chiller building and cooling towers are shown for reference. A total of nine listening locations are indicated by the circles on the map. Sound levels from insect noise and air conditioning units operating during the times measurements were made at these locations resulted to be within -3 to $+8$ dB in a sound level difference when compared to the computer model.



Figure 13. First soundwalk occurred at approximately 3:00 pm conducted with a listening jury consisting of the Trustees and the Vice President of Facilities for the college, architect, mechanical engineer, and other stakeholders.



Figure 14. A second sound walk was held at approximately 8:00 pm to experience the sounds from the chiller plant as background noise levels from distant traffic began to fade away.

sound contours produced in the report given the subtleties of the different frequency content or pitch of the

different fan selections and the presence of other complex environmental sounds in the area.

Conclusions

The full-scale simulation enabled the stakeholders interested in maintaining the soundscape of the site to aurally experience the effects of the various chiller plant designs in a way that was more helpful than seeing noise contours on a site plan. Additionally, the Client understood that low-frequency sounds would likely affect individuals living in the residences directly adjacent to the chiller plant. As a result, the design-oriented intervention allowed for the Client to determine that in addition to providing noise mitigation within the chiller building itself, the purchase of several homes close to the site would also help create a buffer space between the chiller plant and other nearby residences. The project is currently nearing completion (Figure 16). As the Architect inspects the building during construction, the acoustical consultant is engaged to determine solutions to on-site construction difficulties such as openings through the sound isolating walls for pipe penetrations; cuts into the sound-absorbing panels to attach other building system panels directly on the walls; and the size and configuration of sound attenuators at louver openings, among others. Once operational, additional acoustical measurements will be taken at the 14 specific locations established during the soundwalk simulation to verify the accuracy of the full-scale simulation.



Figure 15. It was important to experience the soundscape of the neighborhood with and without the simulated sounds from the proposed chiller plant as the background sounds from traffic and insects decreased in the early morning hours. For this reason, a third sound walk was held again at 3:00 am the following morning.



Figure 16. Acoustical measurements will be taken once construction is complete to verify the sound levels measured during the simulation. This image shows the chiller building before doors are installed and chilled water pipes stored on site.



Figure 17. Acoustical measurements will be taken once construction is complete to verify the sound levels measured during the simulation. This image shows the installation of doors and roll-up doors in the chiller building. The man door to the right of the image opens into the cooling tower well.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

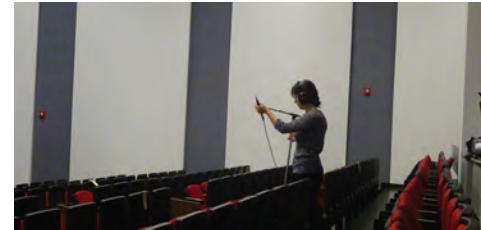
Marylin Roa, a registered Architect in the state of Florida specialized in soundscape design, has an intuitive ability to visualize space and sound three-dimensionally. She has been able to work on more than 225 projects during her 5+ years with Siebein Associates; with some of her favorite acoustical projects located in Honduras, Puerto Rico, Belize, and Kenya. She has coauthored 13 invited papers and presented them at regional, national and international acoustics meetings. She has also co-authored and co-presented continuing education classes in Firing Range Acoustics, Design and Noise Mitigation, and Acoustical Concepts.

Matthew Vetterick has worked on more than 165 projects in his 3+ years with Siebein Associates and excels in developing acoustical solutions for clients that are both efficient and aesthetically pleasing. He iteratively analyses multiple acoustical systems to truly value engineer cost effective healthful soundscapes. He was one of only six recipients to receive the prestigious AIA Florida Bronze Medal in 2016. Matthew has co-authored two invited papers and presented them at regional acoustics meetings. He has also co-authored and co-presented continuing education classes in Firing Range Acoustics, Design and Noise Mitigation.

Gary W. Siebein is co-founder of Siebein Associates and has over 37 years' experience in soundscape planning and design of communities and urban areas, environmental noise and assessment, human and community response to noise, and developing instrumentation for the measurement, monitoring and analysis of sounds in communities in the ways in which they are heard by people. He is an international leader in acoustic and soundscape research. He has completed work on more than 2,000 projects worldwide, written five books, 16 book chapters, and over 200 technical papers and monographs in architectural and environmental acoustics that have been presented at regional, national and international professional society meetings. He is also Professor Emeritus of the University of Florida where he directed and taught the graduate program in Architectural Acoustics for 35 years.

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RITA SIEBEIN
President
RSiebein@SiebeinAcoustic.com
352-331-5111, ext. 21



GARY W. SIEBEIN
Vice President / Senior Principal Consultant
GSiebein@SiebeinAcoustic.com
352-331-5111, ext. 16



KEELY SIEBEIN
Associate Principal Consultant
KSiebein@SiebeinAcoustic.com
352-246-1998



MARYLIN ROA
Senior Consultant
MRoa@SiebeinAcoustic.com
352-256-7924



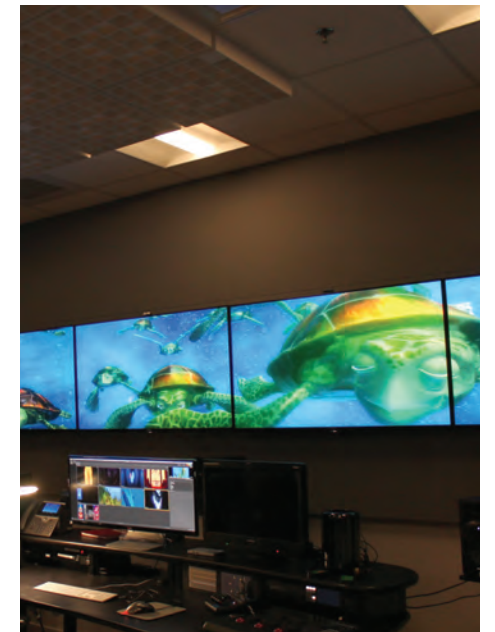
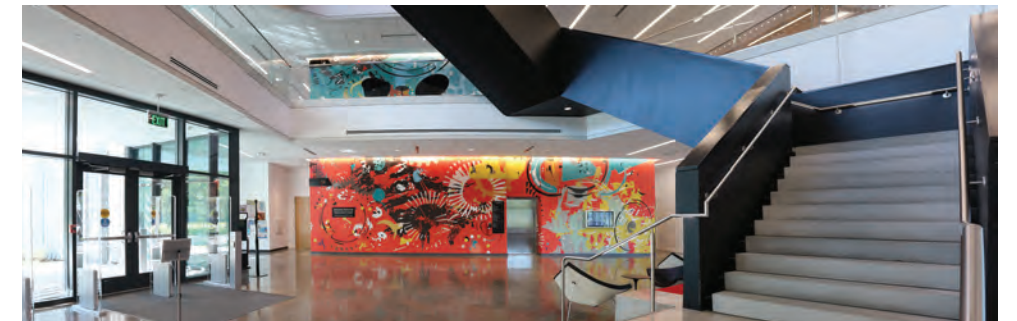
GARY SIEBEIN, JR.
Senior Consultant
Gary@SiebeinAcoustic.com
352-331-5111, ext. 19



JENNIFER MILLER
Senior Consultant
JMiller@SiebeinAcoustic.com
352-331-5111, ext. 12



MATTHEW VETTERICK
Senior Consultant
MVetterick@SiebeinAcoustic.com
352-331-5111, ext. 10



SIEBEIN

ACOUSTIC

ARCHITECTURAL | ENVIRONMENTAL

625 NW 60th Street, Suite C, Gainesville, Florida 32607, USA
352-331-5111 / www.siebeinacoustic.com / office@siebeinacoustic.com