SIEBEIN ACOUSTIC
ARCHITECTURAL | ENVIRONMENTAL

Siebein Associates, Inc.
Consultants in Architectural and Environmental Acoustics
625 NW 60th Street, Suite C Gainesville, Florida 32607
Telephone - (352) 331-5111 Facsimile: (352) 331-0009

April 4, 2023 **REVISED**

City of Clearwater
Attn: Procurement Division
Lori Vogel, CPPB
Procurement Manager
100 S Myrtle Ave 3rd Fl
Clearwater, FL 33756-5520

RE: RFP # 13-23, Noise Analysis Consultant
Due Date for **Revised Proposal**: April 4, 2023

Table of Contents

TAB 1 – Letter of Transmittal

A brief letter of transmittal should be submitted that includes the following information:

a. The proposer's understanding of the work to be performed.
b. A positive commitment to perform the service within the time period specified.
c. The names of key persons, representatives, project managers who will be the main contacts for the city regarding this project.

Dear Lori,

Siebein Acoustic and Professor Martin Gold and the University of Florida School of Architecture; have formed the Soundscape Team to help the City of Clearwater address the noise-related issues related to the Imagine Clearwater amphitheater and other entertainment areas. We like to think of this as the Clearwater 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 Clearwater. 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 Clearwater 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 Clearwater.

The Soundscape Team will complete the work in the proposed time frame of 6 to 12 months.

The key persons and main contact person for the City with the Soundscape Team are listed below.

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)
- Marylin 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)

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

Our proposal represents a firm binding offer for 90 days.

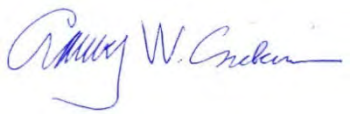
Business Structure: S Corporation

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

We affirm a positive commitment to perform the service within the time period specified

Sincerely,
SIEBEIN ASSOCIATES, INC.



Gary W. Siebein, FAIA, FASA
Senior Principal Consultant

TAB 2 – Demonstrated Experience of the Firm and Project Personnel

a. Identify the project managers(s) and each individual who will work as part of the engagement. Include resumes for each person to be assigned.
b. Describe the experience in conducting similar projects for each of the individuals assigned to the engagement, including their education.
c. Describe the organization of the project team, detailing the level of involvement, field of expertise and estimated hours for each member of the team.

Project Managers, Team Members and Resumes

Project Managers
Gary W. Siebein, Senior Principal Consultant, Siebein Associates, Inc. (Gainesville FL)
Martin Gold, Associate Professor, University of Florida, School of Architecture (Gainesville, FL)
Keely Siebein, Associate Principal Consultant, Siebein Associates, Inc. (Gainesville FL)

Team Members
Gary Siebein, Jr., Senior Consultant, Siebein Associates, Inc. (Gainesville FL)
Marylin 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)

Please see **Appendix A** for Resumes

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 his students. The Soundscape Team will be able to address the unique goals, challenges and complexity associated with the sonic issues the City of Clearwater 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 Clearwater 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 to provide the services outlined in the City of Clearwater'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 Clearwater 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.

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 Clearwater 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.

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 Clearwater, 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.

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 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 Clearwater 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 Clearwater 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 effectives; 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 two areas of concern
  - Studies of 6 specific prioritized areas of concern, the results of which can ideally be translated to the broader community
- Soundwalks
- Sound Level Measurements
- Sound mapping of selected areas of the 2 districts
- 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

Partial Project Listing of Relevant Experience:

Project Name	*Client*	*Size*	*Construction Cost*	*On Time/On Budget*
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
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
City of Greenville South Carolina Urban Soundscape and Noise Ordinance Study	City of Greenville	Approx. 20 city blocks	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
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

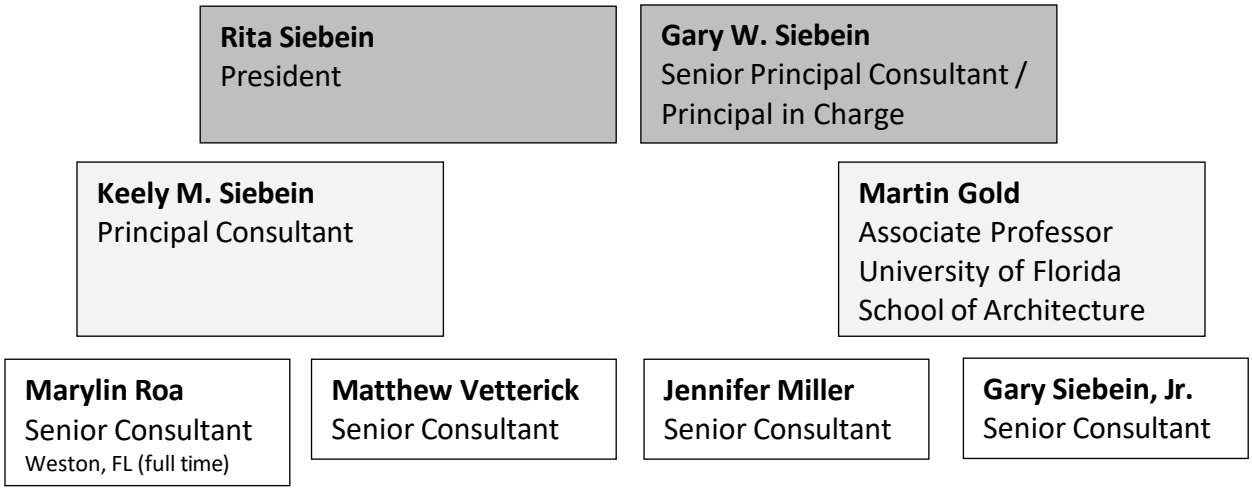
Firm's initiatives towards its own sustainable business practices that demonstrate a commitment to conservation:

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; i.e.: 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.

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

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.
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, AVT, DSCE	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
- City of Fort Lauderdale Soundscape and Noise Ordinance Study, Fort Lauderdale, FL
- City of Greenville Soundscape and Noise Ordinance Study, Greenville, SC
- 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 Sound and 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

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

- Chesapeake Noise Ordinance Acoustical Review of Proposed Changes, Chesapeake, VA Clay County Animal Shelter, Middleburg, FL
- City of Fort Lauderdale Soundscape and Noise Ordinance Study, Fort Lauderdale, FL

- City of Greenville Soundscape and Noise Ordinance Study, Greenville, SC
- 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, 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, 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
- City of Greenville Soundscape and Noise Ordinance Study, Greenville, SC
- 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

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

- Bo Diddly Plaza Noise Study, Gainesville, FL
- Bonnet Springs Park Soundscape Design and Planning, Lakeland, FL
- Catalina at Lake Worth HUD Traffic Noise Study, Lake Worth, FL
- Collins Residence Ship Yard Noise Measurements, Jacksonville, FL
- Creekwood West Commons Traffic Noise Study, Bradenton, FL
- Daytona Beach Potable Water Ground Storage Noise Study, Daytona Beach, FL
- Dunn's Crossing HUD Traffic Noise Study, Jacksonville, FL
- East Avenue Towne Lake Site Noise Study, Austin, TX
- Imagine Clearwater Soundscape Study, Clearwater, FL
- IMAX VIP Cinemas Trinidad, Port of Spain, Trinidad & Tobago
- Interbay Apartment Complex HUD Site Noise Study, Tampa, FL
- KB Home Dunn's Crossing HUD Traffic Noise Study, Jacksonville, FL
- KB Home SR 16 and I-95 HUD Traffic Noise Study, St Johns County, FL
- KB Home Yanie Road HUD Study, Nassau County, FL
- Kiwi Car Wash Noise Study, Port St. Lucie, FL
- Lake Nona Town Center Noise Study, Lake Nona, FL
- Lee Health Fort Myers Hospital Traffic Noise Study, Fort Myers, 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 Site Noise Study, Estero, FL
- Mr. Clean Car Wash Noise Study, Gainesville, FL
- Mr. Clean Car Wash Noise Study, Melbourne, FL
- OCPS Sites 43 and 83 Aircraft Noise Studies, Orlando, FL
- Old Cutler HUD Traffic Noise Study, Homestead, FL
- One Ashley Mixed-Use Development Traffic Noise Study, Tampa, FL
- Port Royal Club Pickleball Noise Study, Naples, FL
- Publix 34th St. Gainesville Site Noise Study, Gainesville, FL
- Publix Princeton Street Site Noise Study, Orlando, FL
- Publix Proposed Site Tallahassee Bannerman at Bull Headley Site Noise Study, Tallahassee, FL
- Publix Site Noise Measurements, Beaufort, SC
- Ringling College Chiller Plant Full Scale Simulation, Sarasota, FL
- Ritz Carlton Amelia Island Pool Bar Noise Study, Amelia Island, 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 Villages, FL
- Union County Shooting Range Sound Study, Blairsville, GA
- Wetherbee Road Proposed Apartment Complex HUD Noise Assessment, Orlando, FL
- Wynwood View HUD Noise Assessment, Miami, 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

TAB 3 – Project Methodology, Approach and Timeline

a. Describe your approach in developing the Imagine Clearwater soundscape and noise ordinance study.
b. Provide a detailed timeline for the services requested.

Soundscape and Noise Ordinance Study to Identify Sound Contours and Sound Control Strategies and Solutions

Siebein Associates Inc., in partnership with the University of Florida (Soundscape Team) proposes to conduct a soundscape study in response to RFP for the City of Clearwater. The Soundscape Team will analyze noise and sound in the Imagine Clearwater area and will propose strategies toward adopting standards for mapping and measuring sound; and offer strategies for detecting and enforcing violations of reasonable maximum permissible sound limits. Initial thoughts indicate that one of the other areas of study may be the Beach. It will also proactively develop recommendations for plans approval processes and construction methods suited to the sonic characteristics of the different areas the Imagine Clearwater project area that can be applied to the City at large. The great diversity of urban and suburban communities within the City of Clearwater suggests a strategic approach to identify a range of urban conditions that represents the larger City of Clearwater, a prioritization of those areas to be determined, and a phased approach to the mapping, measurement, analysis, and subsequent noise control strategies. We propose, over the course of 6 to 12 months to work with city staff, and stakeholders selected by the City to identify critical areas in the vicinity of the Imagine Clearwater project, prioritize those areas for study, conduct a pilot study in the Imagine Clearwater study area, deploy and assess the methodology of analysis, evaluate the results for refinement, and then initiate a broader set of studies in the Imagine Clearwater study area.

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

Advance Preparation – City of Clearwater

1. City to appoint planning staff as point person to liaise with the Soundscape Team.
2. City to discuss the proposed scope of work with the existing noise control advisory committee and report comments to the Consultants.

Task 1: Initial site visit, meeting, and orientation (weeks 1-4)

1. Consultants to meet with planning staff and others selected by the City virtually to help define the specifics of the study

2. Identify the range of areas of concern and potential locations of focused study in the Imagine Clearwater project area.

3. Discuss the history of events and issues leading up to the RFP and the efficacy of strategies that have been utilized previously.

4. Review the noise mapping and mitigation studies for the Imagine Clearwater amphitheater completed to date.

5. Update the noise mapping of sounds from the amphitheater as necessary and include reflections from the library and other buildings surrounding the site.

6. Identify recent events of concern to each group. Brainstorm ideas for potential resolution.

7. Tour with city staff. Initial documentation of sound levels during soundwalks before and after these meetings.

8. Prioritize acoustical zones in the Imagine Clearwater study area that are of concern. Architecture, urban design, occupancy, land use, sound levels, sound sources – inside, outside, types and levels.

   Please note that items 9-15 will be discussed during this task, but will the measurement, mapping and analysis technical studies will be conducted during Task 2.

9. Identify entertainment, commercial and residential areas in the Imagine Clearwater study area. Conduct an acoustical study including measurement, analysis, mapping, and development of initial strategies for monitoring and enforcement for these areas in Task 2.

10. Experience and document existing sonic conditions during several times –Quiet time
    Busy time
    Time when events of concern occur

11. Identify and map future sonic conditions based on the existing comprehensive plan and any projected major projects or trends identified by City staff

12. Recommend a site specific amplified sound policy to include hours of use, frequency of use, manner of use, sound levels (in decibels), and other items to be considered in an agreement for amphitheater usage.

13. Recommend building codes for new construction in the Imagine Clearwater study area anticipated to be impacted by amplified music from the amphitheater.

14. Recommend sound mitigation strategies to reduce the impact of amplified sound and/or noise pollution from the amphitheater on nearby exiting buildings.

15. Evaluate the creation of an Imagine Clearwater overlay district to facilitate specific ordinances and codes that address the unique problems present around the amphitheater and other entertainment districts.

The Soundscape Team will report on the findings from this meeting and set the agenda for the next phase of the study.

Task 2: Conduct the pilot study (weeks 4-12). Soundscape Team leaders and measurement team.

Measure and qualify baseline ambient sonic conditions in the Imagine Clearwater study area during 1 weekend site visit.

Identify sounds of concern to stakeholders, time of concern, and their impressions of possible solutions.

Evaluate program activities associated with acoustical conflicts – uses, proximity, demographics, general construction types (relative to acoustical isolation), buffer spaces, and street activity.

Review findings with City and others as appropriate.

Construct updated noise maps of the selected areas of the Imagine Clearwater section of the City with traffic, entertainment, industrial, residential, and other sources of sound included in the models.

Reconsider and refine the priority areas for the next phase of study – range of areas with noise concerns.

The Soundscape Team will report on the findings from the pilot study and revise the methodology for studying the next group of priority areas.

Task 3: Conduct the detailed documentation, measurement and analysis of the Imagine Clearwater study area (weeks 12-20). Soundscape Team leaders and measurement teams will conduct field studies during this phase.

Measure and qualify baseline ambient sonic conditions – with focus on key issues identified in the Imagine Clearwater initial study.

Document acoustical conditions in each selected zone – the Imagine Clearwater study area.

Conduct sound walks with City officials and the Soundscape Team. This will occur during 1 weekend site visit.

Identify sounds of concern, time of concern, and impressions of possible solutions. Map the existing and possible future sounds in the selected areas

Review findings with City.

Soundscape Team to return to the office/studio for data analysis, scheming, sound mapping and developing initial concepts and strategies for noise measurement, monitoring, and enforcement.

Additionally sound reduction, buffering, mitigating, and enhancing strategies will be evaluated. 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, and provide new opportunities for an invigorating urban living experience for all citizens in a complex, vital, mixed-use urban fabric.

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 the Amphitheater, 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. Sonic transitions between each zone or area can be developed so that the goals of each group can be positively addressed.

The Soundscape Team will report on the findings from these priority area studies toward initial noise abatement, monitoring, and enforcement strategies. In this phase, specific strategies will emerge targeted to be appropriate for the specific areas of study and that can be adapted to other similar circumstances throughout Clearwater.

Task 4: Review of noise ordinance (weeks 16-20).

The current noise ordinance (Section 3-1508) will provide base line information for the studies as part of the ongoing research and evaluation. At this point in the process, 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. The recommendations may include the following among others.

Hours of operation, different allowable sound levels for different times of day and other operational strategies

Accounting for ambient sound levels in each zone or district in the City

Acoustical metrics to be considered including dBA, dBC or more detailed octave band or time-weighted metrics.

Identify allowable sound levels for each zone or district based on current ambient conditions and future projections of sound types and levels. Similar methods have been employed by the team to recommend sound level limits in other emerging and reinvigorating urban areas.

Develop initial protocols for measurement evaluation at sensitive zonal boundaries.

Review with City

Provide recommendations to City Attorney for technical acoustical language to be adjusted or added to the noise ordinance to address the concerns identified in the study.

Review with City

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 scientifically executed sonic planning, design, construction, and operation of residences, commercial, entertainment, 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 Clearwater so exciting and unique as a place to live, work, play, vacation, shop and enjoy.

Task 5a: Recommendations for soundproofing (weeks 16-20).

Identify noise sources of concern that soundproofing is needed to reduce from the soundwalks and noise measurements. These may be specific to a single priority area or may apply to multiple areas. The abatement strategies will be qualified as appropriate for each of the areas and building types and construction.

Where possible, these areas will be keyed to the municipal code adopted by the City of Clearwater.

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 for the design of new buildings with either or both of these strategies to be able to fully function given the diverse uses and soundscapes within and near the buildings.

Review with City

Revise and submit final recommendations

Task 5b: Review and Recommendation for Sound Monitoring Equipment and Software (weeks 16-20)

Review the needs of the Imagine Clearwater and other entertainment districts and recommend possible noise monitoring systems and software that could be used to verify compliance and document exceedances at appropriate locations. These could be localized systems for specific venues or a city wide system with a central monitoring location as well as monitoring read outs at each venue. Logs

of data would be saved to a central location for verification of compliance or use to verify any possible violations.

Task 6: Draft final report (weeks 20-26)

Review with City.

Revise and submit final report.

The current workload of our firm will enable us to satisfactorily engage with the City, stakeholders and others to complete the project within the proposed timeline. 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
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

TAB 4 – References

A minimum of three (3) references, preferably from other public entities in similar size to the City of Clearwater, within the past five (5) years, for whom the proposer has provided noise analysis consulting services. Each reference must include the name of the entity, date of services, position(s), address, contact person, telephone number, and email address.

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

TAB 5 – Cost of Service

a. Include the personnel assigned to each task with billable rates and a total cost per task.
b. Number of hours assigned per person per task.
c. Total cost of all tasks proposed.

Please note that the scope of work and proposed cost includes acoustical documentation and analysis for the Imagine Clearwater project

Additionally, the inclusion of the University of Florida School of Architecture Graduate School gives the opportunity to provide visualizations of what the mitigation strategies and future buildings could look like to meet the intent of the acoustical recommendations. This is a unique aspect of this proposal that would be of significant value to the City so that residents, entertainment venue operators, government officials, and other stakeholders could understand the possibilities for enriching the vibrant life of the City that the acoustical solutions will provide.

Please see next page.

CITY OF CLEARWATER IMAGINE CLEARWATER SOUND STUDY Revised 04/04/23
Clearwater, Florida

PERSON HOUR AND COST ESTIMATE	Senior Principal	Associate Principal	Senior Consultant	Consultant	**SUBTOTALS**
TASK 1: Project kick off, Initial Meetings, Orientation, Site Visit					
Virtual kick off meetings					
Travel, 1 Site visit and meetings, literature review					
Subtotal hours per item	12	24	0	0	
Hourly rate	$300	$175	$135	$125	
Estimated cost for personnel	**$3,600**	**$4,200**	**$0**	**$0**	**$7,800**
Reimbursables					$1,338
Subtotal cost for phase					**$9,138**
TASK 2: Initial Imagine Clearwter Area Study - Site Visits, Meetings with Stakeholders, Imagine Clearwater 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 - in Imagine Clearwater study area					
Review noise mapping for the Amphitheater and reflected sounds off the library and other buildings					
Recommend site specific amplified sound policy, mitigation stratgies and possible code requirements for new construction to reduce sound issues					
Evaluate potential for an Imagine Clearwater Overlay DIstrict					
Update sound mapping for the selected Imagine Clearwater study area					
Soundwalks and measurements in Imagine Clearwater study area					
Soundscape evaluation of Imagine Clearwater study area, initial strategies for sonic intervention elements, initial stregies for standards, monitoring and enforcement in a complex environment					
Subtotal hours per item	24	32	60	60	
Hourly rate	$300	$175	$135	$125	
Estimated cost for personnel	**$7,200**	**$5,600**	**$8,100**	**$7,500**	**$28,400**
Reimbursables					$3,069
Subtotal cost for phase					**$31,469**
Task 3: Imagine Clearwater, and 1 to 2 Other Area Studies Measurement, Soundscape Mapping, Modeling of Alternatives, Strategies for Sonic Interventions					
Identify general types and acoustical properties of buildings using GIS database and field observations, sonic activities, base line ambient sound levels, acoustical issues in the Imagine Clearwater study area					
Conduct soundwalks with City staff and stakeholders in the Imagine Clearwater study area					
review findings with Team and stakeholders					
Construct and analyze sound maps and design models of study area					
Analyze data, develop initial concepts for soundscape compatibility planning, design interventions, noise ordinance development and soundproofing where needed					
Analyze potential approaches at the scale of individual buildings, near by buildings and plazas, etc., the Imagine Clearwater 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 the study area and how the approaches and strategies developed in each can possibly be transferred to the larger city envionment and other areas					
Subtotal hours per item	32	32	95	60	
Hourly rate	$300	$175	$135	$125	
Estimated cost for personnel	**$9,600**	**$5,600**	**$12,825**	**$7,500**	**$35,525**
Reimbursables					$2,063
Subtotal cost for phase					**$37,588**

47779

	Senior Principal	Associate Principal	Senior Consultant	Consultant	**SUBTOTALS**
Task 4: Analysis and Review of Noise and Zoning Ordinances					
Draft possible ordinance adjustments, Review with City and stakeholders, revise report, Present Final Draft					
Subtotal hours per item	8	40	0	0	
Hourly rate	$295	$175	$135	$125	
Estimated cost for personnel	**$2,360**	**$7,000**	**$0**	**$0**	**$9,360**
Reimbursables					$0
Subtotal cost for phase					**$9,360**

	Principal	Principal	Consultant	Consultant	**SUBTOTALS**
Task 5: Analysis and Recommendations for Soundproofing and Noise Monitoring and Mitigation					
Acoustical analysis of typical buildings with recommendations for soundscape compatibility planning, soundproofing and other noise mitigation strategies as needed					
Review and recommend sound monitoring and software for use to assist in regulating sounds in the Imagine Overlay district					
Subtotal hours per item	8	24	16	40	
Hourly rate	$300	$175	$135	$125	
Estimated cost for personnel	**$2,400**	**$4,200**	**$2,160**	**$5,000**	**$13,760**
Reimbursables					$0
Subtotal cost for phase					**$13,760**
Task 6: Final Report					
Draft report, Review with City and revise report, Public presentation via video call					
Subtotal hours per item	12	12	12	8	
Hourly rate	$300	$175	$135	$125	
Estimated cost for personnel	**$3,600**	**$2,100**	**$1,620**	**$1,000**	**$8,320**
Reimbursables					$0
Subtotal cost for phase					**$8,320**
UF faculty time and fringes					**$27,754**
UFexpenses					**$15,794**
Subtotal personnel costs					**$130,919**
Subtotal expenses					**$22,264**
TOTAL DESIGN FEES AND REIMBURSABLES					**$153,183**

TAB 6 – Forms

a. Exceptions/Additional Materials/Addenda form
b. Vendor Information form
c. Vendor Certification of Proposal form
d. Scrutinized Companies form(s) as required
e. E-Verify Eligibility form
f. W-9 Form. Include a current W-9 form

Please see next pages.

EXCEPTIONS / ADDITIONAL MATERIAL / ADDENDA

Proposers shall indicate any and all exceptions taken to the provisions or specifications in this solicitation document. Exceptions that surface elsewhere and that do not also appear under this section shall be considered invalid and void and of no contractual significance.

Exceptions (mark one):

****Special Note – Any material exceptions taken to the City's Terms and Conditions may render a Proposal non-responsive.**

_____ No exceptions

_X_ Exceptions taken (describe--attach additional pages if needed)

Please see next page.

Additional Materials submitted (mark one):

_____ No additional materials have been included with this proposal

_X_ Additional Materials attached (describe--attach additional pages if needed)

We have included Appendix A to include team resumes and Appendix B to include Relevant Publications, Architectural Licenses and Certifications, and our Soundscape Assessment and Design portofolio

Acknowledgement of addenda issued for this solicitation:
Prior to submitting a response to this solicitation, it is the vendor's responsibility to confirm if any addenda have been issued.

Addenda Number	Initial to acknowledge receipt
addendum-1_12.19.22	GWS
13-23_addendum-2_12.23.22	GWS
13-23_addendum-3_01.04.2023	GWS

Vendor Name Siebein Associates, Inc. Date: January 12, 2023

VENDOR INFORMATION

Company Legal/Corporate Name: Siebein Associates, Inc.

Doing Business As (if different than above): _____

Address: 625 NW 60th Street, Suite C

City: Gainesville State: FL Zip: 32607 - 2090

Phone: 352-331-5111 Fax: 352-331-0009

E-Mail Address: Office@SiebeinAcoustic.com Website: www.SiebeinAcoustic.com

DUNS # 034779988

Remit to Address (if different than above):

Address: _____

City: _____ State: ____ Zip: _____

Order from Address (if different from above):

Address: _____

City: _____ State: _____ Zip: _____

Contact for Questions about this proposal:

Name: Gary W. Siebein Fax: 352-331-0009

Phone: 352-331-5111 E-Mail Address: GSiebein@SiebeinAcoustic.com

Day-to-Day Project Contact (if awarded):

Name: Gary W. Siebein Fax: 352-331-0009

Phone: 352-331-5111 E-Mail Address: GSiebein@SiebeinAcoustic.com

_____ Certified Small Business

Certifying Agency: _____

X Certified Minority, Woman or Disadvantaged Business Enterprise

Certifying Agency: State of Florida Office of Supplier Diversity

Provide supporting documentation for your certification, if applicable.

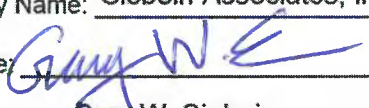
VENDOR CERTIFICATION OF PROPOSAL

By signing and submitting this Proposal, the Vendor certifies that:

a) It is under no legal prohibition to contract with the City of Clearwater.
b) It has read, understands, and is in compliance with the specifications, terms and conditions stated herein, as well as its attachments, and any referenced documents.
c) It has no known, undisclosed conflicts of interest.
d) The prices offered were independently developed without consultation or collusion with any of the other respondents or potential respondents or any other anti-competitive practices.
e) No offer of gifts, payments or other consideration were made to any City employee, officer, elected official, or consultant who has or may have had a role in the procurement process for the services and or goods/materials covered by this contract.
f) It understands the City of Clearwater may copy all parts of this response, including without limitation any documents and/or materials copyrighted by the respondent, for internal use in evaluating respondent's offer, or in response to a public records request under Florida's public records law (F.S. 119) or other applicable law, subpoena, or other judicial process.
g) Respondent hereby warrants to the City that the respondent and each of its subcontractors ("Subcontractors") will comply with, and are contractually obligated to comply with, all Federal Immigration laws and regulations that relate to their employees.
h) Respondent certifies that they are not in violation of section 6(j) of the Federal Export Administration Act and not debarred by any Federal or public agency.
i) It will provide the materials or services specified in compliance with all Federal, State, and Local Statutes and Rules if awarded by the City.
j) It is current in all obligations due to the City.
k) It will accept such terms and conditions in a resulting contract if awarded by the City.
l) The signatory is an officer or duly authorized agent of the respondent with full power and authority to submit binding offers for the goods or services as specified herein.

ACCEPTED AND AGREED TO:

Company Name: Siebein Associates, Inc.

Signature: 

Printed Name: Gary W. Siebein

Title: Senior Principal Consultant

Date: January 12, 2023

SCRUTINIZED COMPANIES AND BUSINESS OPERATIONS WITH CUBA AND SYRIA CERTIFICATION FORM

IF YOUR BID/PROPOSAL IS $1,000,000 OR MORE, THIS FORM MUST BE COMPLETED AND SUBMITTED WITH THE BID/PROPOSAL. FAILURE TO SUBMIT THIS FORM AS REQUIRED MAY DEEM YOUR SUBMITTAL NONRESPONSIVE.

The affiant, by virtue of the signature below, certifies that:

1. The vendor, company, individual, principal, subsidiary, affiliate, or owner is aware of the requirements of section 287.135, Florida Statutes, regarding companies on the Scrutinized Companies with Activities in Sudan List, the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or engaging in business operations in Cuba and Syria; and
2. The vendor, company, individual, principal, subsidiary, affiliate, or owner is eligible to participate in this solicitation and is not listed on either the Scrutinized Companies with Activities in Sudan List, the Scrutinized Companies with Activities in the Iran Petroleum Sector List, or engaged in business operations in Cuba and Syria; and
3. Business Operations means, for purposes specifically related to Cuba or Syria, engaging in commerce in any form in Cuba or Syria, including, but not limited to, acquiring, developing, maintaining, owning, selling, possessing, leasing or operating equipment, facilities, personnel, products, services, personal property, real property, military equipment, or any other apparatus of business or commerce; and
4. If awarded the Contract (or Agreement), the vendor, company, individual, principal, subsidiary, affiliate, or owner will immediately notify the City of Clearwater in writing, no later than five (5) calendar days after any of its principals are placed on the Scrutinized Companies with Activities in Sudan List, the Scrutinized Companies with Activities in the Iran Petroleum Sector List, or engaged in business operations in Cuba and Syria.

Rita A. Siebein
Authorized Signature

Rita A. Siebein
Printed Name

President
Title

Siebein Associates, Inc.
Name of Entity/Corporation

STATE OF Florida

COUNTY OF Alachua

The foregoing instrument was acknowledged before me by means of ☒ physical presence or ☐ online notarization on, this 4th day of January, 2023, by Rita A. Siebein (name of person whose signature is being notarized) as the President (title) of Siebein Associates Inc. (name of corporation/entity), personally known X, or produced _____ (type of identification) as identification, and who did/did not take an oath.

Rebecca Sutphin
Notary Public

Rebecca Sutphin
Printed Name

My Commission Expires: 11/13/23
NOTARY SEAL ABOVE

REBECCA N. SUTPHIN
Notary Public-State of Florida
Commission # GG 931629
My Commission Expires
November 13, 2023

SCRUTINIZED COMPANIES THAT BOYCOTT ISRAEL LIST CERTIFICATION FORM

THIS FORM MUST BE COMPLETED AND SUBMITTED WITH THE BID/PROPOSAL. FAILURE TO SUBMIT THIS FORM AS REQUIRED MAY DEEM YOUR SUBMITTAL NONRESPONSIVE.

The affiant, by virtue of the signature below, certifies that:

1. The vendor, company, individual, principal, subsidiary, affiliate, or owner is aware of the requirements of section 287.135, Florida Statutes, regarding companies on the Scrutinized Companies that Boycott Israel List, or engaged in a boycott of Israel; and
2. The vendor, company, individual, principal, subsidiary, affiliate, or owner is eligible to participate in this solicitation and is not listed on the Scrutinized Companies that Boycott Israel List, or engaged in a boycott of Israel; and
3. "Boycott Israel" or "boycott of Israel" means refusing to deal, terminating business activities, or taking other actions to limit commercial relations with Israel, or persons or entities doing business in Israel or in Israeli-controlled territories, in a discriminatory manner. A statement by a company that it is participating in a boycott of Israel, or that it has initiated a boycott in response to a request for a boycott of Israel or in compliance with, or in furtherance of, calls for a boycott of Israel, may be considered as evidence that a company is participating in a boycott of Israel; and
4. If awarded the Contract (or Agreement), the vendor, company, individual, principal, subsidiary, affiliate, or owner will immediately notify the City of Clearwater in writing, no later than five (5) calendar days after any of its principals are placed on the Scrutinized Companies that Boycott Israel List, or engaged in a boycott of Israel.

Rita A Siebein
Authorized Signature

Rita A. Siebein
Printed Name

President
Title

Siebein Associates, Inc.
Name of Entity/Corporation

STATE OF Florida

COUNTY OF Alachua

The foregoing instrument was acknowledged before me by means of ☒ physical presence or ☐ online notarization on, this 9th day of January, 2023, by Rita A. Siebein (name of person whose signature is being notarized) as the President (title) of Siebein Associates Inc (name of corporation/entity), personally known ✓, or produced _____ (type of identification) as identification, and who did/did not take an oath.

Rebecca Sutphin
Notary Public

Rebecca Sutphin
Printed Name

REBECCA N. SUTPHIN
Notary Public-State of Florida
Commission # GG 931629
My Commission Expires
November 13, 2023

My Commission Expires: 11/13/23
NOTARY SEAL ABOVE

VERIFICATION OF EMPLOYMENT ELIGIBILITY FORM

PER FLORIDA STATUTE 448.095, CONTRACTORS AND SUBCONTRACTORS MUST REGISTER WITH AND USE THE E-VERIFY SYSTEM TO VERIFY THE WORK AUTHORIZATION STATUS OF ALL NEWLY HIRED EMPLOYEES.

THIS FORM MUST BE COMPLETED AND SUBMITTED WITH THE BID/PROPOSAL. FAILURE TO SUBMIT THIS FORM AS REQUIRED MAY DEEM YOUR SUBMITTAL NONRESPONSIVE.

The affiant, by virtue of the signature below, certifies that:

1. The Contractor and its Subcontractors are aware of the requirements of Florida Statute 448.095.
2. The Contractor and its Subcontractors are registered with and using the E-Verify system to verify the work authorization status of newly hired employees.
3. The Contractor will not enter into a contract with any Subcontractor unless each party to the contract registers with and uses the E-Verify system.
4. The Subcontractor will provide the Contractor with an affidavit stating that the Subcontractor does not employ, contract with, or subcontract with unauthorized alien.
5. The Contractor must maintain a copy of such affidavit.
6. The City may terminate this Contract on the good faith belief that the Contractor or its Subcontractors knowingly violated Florida Statutes 448.09(1) or 448.095(2)(c).
7. If this Contract is terminated pursuant to Florida Statute 448.095(2)(c), the Contractor may not be awarded a public contract for at least 1 year after the date on which this Contract was terminated.
8. The Contractor is liable for any additional cost incurred by the City as a result of the termination of this Contract.

Rita A. Siebein
Authorized Signature
Rita A. Siebein
Printed Name
President
Title
Siebein Associates, Inc.
Name of Entity/Corporation

STATE OF Florida

COUNTY OF Alachua

The foregoing instrument was acknowledged before me by means of ☒ physical presence or ☐ online notarization on, this 9th day of January, 2023, by Rita A. Siebein (name of person whose signature is being notarized) as the President (title) of Siebein Associates Inc (name of corporation/entity), personally known ✓, or produced _____ (type of identification) as identification, and who did/did not take an oath.

Rebecca Sutphin
Notary Public
Rebecca Sutphin
Printed Name

My Commission Expires: 11/13/23
NOTARY SEAL ABOVE

REBECCA N. SUTPHIN
Notary Public-State of Florida
Commission # GG 931629
My Commission Expires
November 13, 2023

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

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

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

Print or type. See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.
Siebein Associates, Inc.

2 Business name/disregarded entity name, if different from above

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.

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☑ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is not disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.
625 NW 60th Street, Suite C

6 City, state, and ZIP code
Gainesville, FL 32607

City of Clearwater
100 S. Myrtle Ave.
Clearwater, FL 33756

7 List account number(s) here (optional)

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
			-			-				

or

Employer identification number
5	9	-	3	2	2	6	8	8	2

Part II Certification

Under penalties of perjury, I certify that:

1. 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
2. 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
3. I am a U.S. citizen or other U.S. person (defined below); and
4. 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 ▶ Rita A Siebein Date ▶ January 12, 2023

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.*

Appendix A – Resumes for Project Managers and Team Members

SIEBEIN ACOUSTIC

ARCHITECTURAL | ENVIRONMENTAL

Gary W. Siebein, FASA, FAIA, NCARB

Senior Principal Consultant

ROLE: Principal in Charge

Director of Acoustical Design and Analysis; Overall Project Direction, Quality Control Review of Work, Client Relations

AREAS OF EXPERTISE

Soundscape Planning and Design, Environmental Noise; Architectural Acoustic Design of Indoor and Outdoor Performance Spaces; Mechanical System Noise & Vibration Control

EDUCATION

M.A. (Architecture), 1980
University of Florida

Bachelor of Architecture, 1978
Rensselaer Polytechnic Institute

B.S. (Building Science), 1972
Rensselaer Polytechnic Institute

REGISTRATION

Registered Architect Florida # 8846
Registered Architect Georgia #RA014816
NCARB # 86214

AFFILIATIONS

Fellow, American Institute of Architects
Fellow, Acoustical Society of America
Member: NCAC, ASTM, ASHRAE

PROFESSIONAL EXPERIENCE

40+ Years

CONTACT INFORMATION

625 NW 60th Street, Suite C
Gainesville, Florida 32607
352-331-5111 x 16
gsiebein@siebeinacoustic.com

ARCHITECTURAL AND ENVIRONMENTAL ACOUSTICS

Intelligently designing architectural, urbane and natural soundscapes for creative and healthy living.

Gary W. Siebein, co-founder of Siebein Associates has over 40 years' extensive experience in soundscape planning and design of communities and urban areas, acoustical design of exhibit and performance spaces, 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 has completed work on over 2,400 projects worldwide for many clients including governmental agencies as well as clients in the private and public sectors. He is also Professor Emeritus of the School of Architecture at the University of Florida where for 35 years he directed a graduate program in building and environmental acoustics. He is an international leader in acoustic and soundscape research. He has written five books, 17 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. Gary is the 18th recipient of the prestigious Wallace Clement Sabine Medal in Architectural Acoustics from the Acoustical Society of America.

Professor Siebein's innovative approach to understanding and shaping the aural environments of buildings, as well as his soundscape assessments and designs have been widely publicized through consulting work on significant projects as well as papers and presentations given at national and international meetings over a 40+ year period. His consulting work is marked by development of systems to measure sounds as they are actually heard by people, detailed characterizations of ambient sounds, sophisticated computer modeling techniques to help optimize the acoustical environment in complex, mixed-use urban areas, accurately predicting future potential noise impacts, and designing creative noise mitigation solutions for difficult situations.

He is an acoustical artist and scientist whose work is governed by the technical precision and imaginative methods that define the latest technology in the field. These techniques, which include auralizations, or acoustical simulations of proposed sounds that people can actually listen to as part of the project evaluation process, allows consensus among project stakeholders and realistic judgments to be made about project impacts as part of a participatory and engaging process. He is well known as an intelligent team player who can bring diverse groups of stakeholders together in acoustical dialogue on key projects.

His experience of work on innovative projects around the world, and research for many government agencies including the National Science Foundation gives him unique qualifications to provide state-of-the-art consulting services for a wide array of project types.

EXPERIENCE

- Senior Principal Consultant, Siebein Associates (1981-present)
  - Acoustical consulting commissions in private practice, including space shaping of theaters, interior and exterior noise control, mechanical system noise control, and sound system design.
- Faculty Member (Professor), University of Florida (1980-2015)
  - University Research Foundation Professor (1999-2002)
  - Director, Architecture Technology Research Center (1985-2015)
- Architectural design work in several small firms in southwestern Connecticut (1972-1980)

RELEVANT PROJECT EXPERIENCE (partial list)

- 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
- City of Greenville Soundscape and Noise Ordinance Study, Greenville, SC
- 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
- The Villages Florida Turnpike Planning Soundscape Analysis and Noise Mitigation, The Village, FL
- Ybor City Noise Ordinance, Ybor City, FL

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Intelligently designing architectural, urbane and natural soundscapes for creative and healthy living.

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

ROLE: Associate Principal Consultant

Acoustical Design and Analysis, Soundscape Design, Stakeholder Meetings

AREAS OF EXPERTISE

Architectural Acoustic Design,
Environmental Noise

EDUCATION

Master of Architectural Acoustics (2012)
University of Florida, cum laude

Bachelor of Arts in Theater (2007) University of Florida, cum laude

ACCREDITATION

USGBC 11003489-AP-BD+C

AFFILIATIONS

Member:
Acoustical Society of America (ASA);
Florida Chapter ASA (FL-ASA);
Institute of Noise Control Engineers (INCE);
U.S. Green Building Council (USGBC);
American Society for Testing and Materials (ASTM) E33 Committee Member
American Society of Safety Professionals (ASSP);
Florida Healthcare Engineering Association (FHEA);
Florida Chapter American Institute of Industrial Hygiene (FL-AIHA);
European Cooperation in Science & Technology (COST)

PROFESSIONAL EXPERIENCE

23 Years

CONTACT INFORMATION

625 NW 60th Street, Suite C
Gainesville, Florida 32607
352-331-5111 x 25
ksiebein@siebeinacoustic.com

Keely Siebein's experience in acoustical consulting includes research; technical field data collection and analysis; room acoustics analysis and design; sound isolation systems analysis and design; and environmental acoustics analysis and design. She has completed work on over 420 projects for clients on a wide range of projects. She has completed research on natural, historic, and urban soundscapes, classroom acoustics, healthcare and NICU acoustics, performance space acoustics, and has performed critical analysis of acoustical standards.

Keely has worked on various project types including healthcare facilities, environmental acoustic measurements and analysis, theme park attractions, worship spaces, performance spaces, educational facilities, transportation facilities, condominiums, residences, and restaurant and dining facilities performing acoustical measurements, analysis, and design of the spaces. She has also worked on a number of environmental acoustic projects and traffic noise studies.

Keely is a member of the Acoustical Society of America and serves as President of the Florida chapter of the ASA. She received the Robert Bradford Newman award for excellence in architectural acoustical research in 2012 and now serves on the Robert B. Newman Advisory Board. She was invited to be a speaker at the 2021 Acoustical Society of America School in Seattle, WA. She was previously selected as a participant in the prestigious Acoustical Society of America School in Kansas City, Missouri in 2012.

Keely is a proponent of sustainability and green buildings, and is actively involved in acoustical professional societies, technical committees, working groups and development of acoustic standards.

EXPERIENCE

- Siebein Associates, Inc.
  - Associate Principal Consultant, 2021-present
  - Senior Consultant, 2016-2021
  - Consultant, 2009-2016
  - Junior Consultant, 2002-2007
  - Research Assistant, 1999-2002

SERVICE TO PROFESSIONAL SOCIETIES

- President: Florida Chapter of the Acoustical Society of America: 2018 - present
- Member: American Society for Testing and Materials (ASTM) E33 Committee
- Chair: Council for the Model Aquatic Health Code Acoustical Design Ad Hoc Committee: 2016 -2018
- Robert Bradford Newman Fund Advisory Board (Architectural Acoustics) 2017-present
- Secretary: Florida Chapter of the Acoustical Society of America: 2015 - 2019
- ASC Noise – TAG TC 43/SC1: Alternate Voting Representative - 2009 - 2011

AWARDS

- Robert Bradford Newman Award for Excellence in Architectural Acoustics: 2012

PUBLICATIONS

- Co-author: Natural Soundscapes: A Sonic Exploration of Ichetucknee Springs State Park 2022
- Editor and Chapter Contributor: Bertram Y. Kinzey, Jr. Contributions and Influences on Current Research, Teaching and Design of the Architecture of Sound. Ch 14, Pp. 187-204. 2020
- Co-author: Satisfying Hunger, Thirst, and Acoustic Comfort in Restaurants, Diners, and Bars…Is This an Oxymoron? Acoustics Today, Summer 2019, volume 15, issue 2.

RELEVANT PROJECT EXPERIENCE (partial list)

- City of Greenville Soundscape and Noise Ordinance Study, Greenville, SC
- Grassy Waters Preserve Environmental Acoustic Assessment, Palm Beach, FL
- Imagine Clearwater Coachman Park Sound and Soundscape Study, Acoustical Design, 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 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
- Solar Energy Plant Site Noise Study, Archer, FL
- Ybor City Noise Ordinance, Ybor City, FL

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Gary Siebein Jr., CTS, AVT, DSCE

Senior Consultant

ROLE: Senior Acoustical Consultant

AV Systems Design, Environmental Noise Measurement, Project Data Analysis and Field Measurements

AREAS OF EXPERTISE

Acoustical Measurements
Environmental Noise
Sound System Design

CERTIFICATIONS

AVIXA Certified Technology Specialist
AVIXA Audio Visual Technologist
AVIXA Digital Signage Certified Expert
Audinate Dante Certification Level 1 & 2
Cambridge Sound Qt Pro Certified Masking Expert
Cambridge Sound Dynasound Pro Certified Masking Expert

AFFILIATIONS

Member:
AVIXA
Florida Chapter - Acoustical Society of America

PUBLICATIONS

Gary has co-authored many papers on the subject of environmental acoustics and has presented published papers at regional and national acoustics meetings.

PROFESSIONAL EXPERIENCE

14 Years

CONTACT INFORMATION

625 NW 60th Street, Suite C
Gainesville, Florida 32607
352-331-5111 x 19
gary@siebeinacoustic.com

Gary has 14 years' experience consulting with Siebein Associates and has worked on more than 350 projects. He is a member of Siebein Associates' A/V Design Team where his expertise and certifications in sound system and A/V design allow him to design functional and practical sound, audio and video systems in performing arts centers, religious facilities, educational facilities, theme parks and many other building types.

Gary is also a key member of our environmental noise team, leading many environmental noise impact studies in the field. His technical dexterity and extensive experience allow him to operate specialized equipment and advanced digital software under any conditions to gain insight into custom sound mitigation techniques and design solutions.

He is fluent on many sound level meters including meters by Larson Davis, B+K, Cesva, Rion, Svantek and Ivie. He is proficient in architectural/acoustic software programs including AutoCAD, TNM, SARNAM, WinMLS, and EASE.

He has worked on various building types including worship spaces, performance halls, firing ranges, educational facilities, amusement park attractions, condominiums, and hospitals, as well as been involved on environmental impact projects and traffic noise studies.

EXPERIENCE

- Siebein Associates, Inc.
  - Senior Consultant, 2021-present
  - Consultant, 2016-2021
  - Technical Acoustic Specialist, 2010-2016
  - Junior Consultant, 2008-2010

RELEVANT PROJECT EXPERIENCE (partial list)

- 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
- Capitol View Mixed-Use HUD Traffic and Rail Noise Study, Nashville, TN
- Center Place Proposed Mixed-Use Development Sound Study, Fort Myers, FL
- City of Greenville Soundscape and Noise Ordinance Study, Greenville, SC
- 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
- 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 Noise Study, 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

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Intelligently designing architectural, urbane and natural soundscapes for creative and healthy living.

Marylin Roa, AIA, ASA, INCE

Senior Consultant

ROLE: Senior Acoustical Consultant

Lead Acoustical Designer, 3D Acoustic Computer Modeling, Interior Room Acoustic and Finish System Design

AREAS OF EXPERTISE

Architectural Acoustic Design
Mechanical System Design
Environmental Noise

EDUCATION

Master of Architecture (2014) University of Florida

Bachelor of Architecture (2012) Florida International University

REGISTRATION

Registered Architect Florida # AR100453

AFFILIATIONS

Member, American Institute of Architects
Member, Acoustical Society of America
Member, Institute of Noise Control Engineering

PUBLICATIONS

Marylin has co-authored papers on the subject of architectural acoustics and computer modeling systems and has presented published papers at regional and national acoustics meetings.

PROFESSIONAL EXPERIENCE

8 Years

CONTACT INFORMATION

625 NW 60th Street, Suite C
Gainesville, Florida 32607
352-331-5111 x 14
mroa@siebeinacoustic.com

Marylin designs creative solutions to acoustical challenges faced in more than 30 building types. The acoustical assessment of multiple project types allows her to be involved in the acoustical design of sensitive performance venues for music and theater, quiet background noise levels for recording studios, and creating graphic acoustical 3-D modeling of loud noise generating sources to determine their noise impact on buildings and the environment. By being able to determine applicable regulations and ordinances for each project type, Marylin can interpret the acoustical measurements made on site as well as virtually in computer models and provide recommendations that meet design criteria and provide comfortable acoustic environments.

Marylin's ability to visualize space and sound three-dimensionally helps her have clear conversations with owners, architects, engineers, and contractors. Marylin has been immersed in more than 400 projects during her time with Siebein Associates and is experienced in all phases of project management, from schematic design through construction. She actively participates in project meetings, clearly communicating acoustical design goals and acoustical recommendations to designers, owners, user groups and project stakeholders. Marylin consistently applies her skills and experience to find creative acoustic solutions for her projects and excels in providing acoustic design and analysis for critical acoustic spaces.

She is proficient in many architectural/acoustic software programs including EASE, INSUL, AutoCAD, Revit, Trane, VA Select, Ibana Calc, Cope Calc, TNM, CadnaA, CATT Acoustic, and Photoshop.

EXPERIENCE

- Siebein Associates, Inc.
  - Senior Consultant, 2019-present
  - Consultant, 2014– 2019

SPECIAL ACHIEVEMENTS

- Robert Bradford Newman Award for Excellence in Architectural Acoustics (2014)
- Architecture MRP Design Honor Award, University of Florida(2014)
- Architecture Academic Excellence Award, University of Florida (2014)
- Architecture Academic Achievement, University of Florida (2013)

RELEVANT PROJECT EXPERIENCE (partial list)

- 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
- City of Greenville Soundscape and Noise Ordinance Study, Greenville, SC
- 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 Sound Study, 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

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Jennifer Miller, Assoc. AIA, ASA
Senior Consultant

ROLE: 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

AREAS OF EXPERTISE
Acoustical Measurements
Architectural Acoustic Design
HVAC Design

EDUCATION
Master of Architecture (2015)
University of Florida

Bachelor of Design in Architecture
cum laude (2013), University of Florida

AFFILIATIONS
Associate, American Institute of Architects
Member, Acoustical Society of America

PUBLICATIONS
Jennifer has co-authored papers on the subject of architectural acoustics and natural soundscapes and has presented published papers at regional and national acoustics meetings.

PROFESSIONAL EXPERIENCE
7 Years

CONTACT INFORMATION
625 NW 60th Street, Suite C
Gainesville, Florida 32607
352-331-5111 x 12
jmiller@siebeinacoustic.com

ARCHITECTURAL AND ENVIRONMENTAL ACOUSTICS
Intelligently designing architectural, urbane and natural soundscapes for creative and healthy living.

Jennifer excels in architectural acoustic design and analysis. Having worked on more than 380 projects with Siebein Associates, Jennifer is proficient in full-cycle project management from schematic design through construction and has considerable experience in taking field measurements, analyzing data, and performing specialized acoustical analysis in many types of buildings.

She collaborates very well with architects, design teams and project stakeholders, carefully analyzing design criteria, and consistently creating functional and aesthetically pleasing acoustical systems in a wide variety of building acoustic and environmental noise projects.

Jennifer works with her Siebein Acoustic team members to expedite site noise level sound transmission, background noise level and reverberation time measurements as well as provide acoustical review for building certifications such as LEED, WELL and Green Globes. She has performed substantial completion acoustical measurements for multiple projects and project typologies including academic buildings for K-12 and higher level education institutions, performing arts facilities, airports, governmental facilities, multi-purpose buildings and residential buildings.

Jennifer is fluent in many architectural/acoustic software programs including TAP, INSUL, Adobe Suite Programs, AutoCAD, Rhinoceros, VRay Rendering Software, Brazil Rendering Software, Grasshopper Software, Microsoft Office Programs, Ecotect, and V-A Select and is proficient in taking acoustic measurements using sound level meters by Rion, Cesva, B+K, Svantek and Larson Davis.

EXPERIENCE
- Siebein Associates, Inc.
  - Senior Consultant, 2021-present
  - Consultant, 2015-2021
  - Intern Consultant, 2014-2015

SPECIAL ACHIEVEMENTS
- Selected as participant in the Acoustical Society of America School in Salt Lake City (2016)
- Robert Bradford Newman Award for Excellence in Architectural Acoustics (2015)

RELEVANT PROJECT EXPERIENCE (partial list)
- 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
- 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 Sites 43 and 83 Aircraft Noise Studies, 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 Noise Study, Sarasota, FL
- Ritz Carlton Amelia Island Pool Bar Noise, Amelia Island, FL
- Luxury Shopping Mall Construction Noise Monitoring, 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

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Matthew Vetterick, AIA, NCARB
Senior Consultant

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

AREAS OF EXPERTISE
Acoustical Measurements
Architectural Acoustic Design
Mechanical System Noise and Vibration

EDUCATION
Master of Architecture (2016), University of Florida

Bachelor of Design in Architecture summa cum laude (2014), University of Florida

Associate in Arts in Architecture (2012), Valencia College

REGISTRATION
Registered Architect Florida # AR101159
NCARB # 100758

AFFILIATIONS
Member, American Institute of Architects
Member, Acoustical Society of America

PROFESSIONAL EXPERIENCE
6 Years

CONTACT INFORMATION

625 NW 60th Street, Suite C
Gainesville, Florida 32607
352-331-5111 x 10
mvetterick@siebeinacoustic.com

ARCHITECTURAL AND ENVIRONMENTAL ACOUSTICS
Intelligently designing architectural, urbane and natural soundscapes for creative and healthy living.

During his time with Siebein Associates, Matthew has worked on more than 375 projects and excels in developing acoustical solutions for clients that are both efficient and aesthetically pleasing. He is experienced in all phases of project management, from schematic design through construction and collaborates perceptively with design team members and project stakeholders, consistently providing thoughtful acoustical design goals and recommendations.

Matthew iteratively analyzes 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 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.

He is adept in many architectural/acoustic software programs including EASE, AutoCAD, Revit, INSUL, IBANA Calc, Rhinoceros, CADNA, VRay Rendering Software, Grasshopper Software, Ecotect, V-A Select, TAP (Trane Acoustic Program), Adobe Suite Programs and Microsoft Office. Matthew is also experienced in taking acoustic measurements using sound level meters by Larson Davis, Svantek and Win MLS software.

Matthew is highly accomplished in performing mechanical system noise and vibration analysis and room acoustic analysis. He is deeply experienced in taking field measurements in accordance with ASTM, ISO, and ANSI standards, analyzing the measured data and incorporating the data into clear, detailed reports for many building types. He develops thoughtful and effective acoustical recommendations for many situations. Matthew is equally proficient onsite and in the acoustical laboratory.

EXPERIENCE
- Siebein Associates, Inc.
  - Senior Consultant, 2021-present
  - Consultant, 2016-2021
  - Intern Consultant, 2015-2016

SERVICE TO PROFESSIONAL SOCIETIES
- AIA Gainesville Chapter, President (2022-present)
- AIA Gainesville Chapter, Vice President (2021)
- AIA Gainesville Chapter, Secretary (2020)
- AIA Gainesville Chapter, Interim Associate Chapter Director (2019)

SPECIAL ACHIEVEMENTS
- AIA Florida Bronze Medal (2016
- Featured Student Work Chicago Architecture Foundation (2010)
- The Architecture Handbook - Student Design Experience
- Eagle Scout, Boy Scouts of America (2007)

RELEVANT PROJECT EXPERIENCE (partial list)
- 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
- Lake Nona Community Noise Monitoring Mapping and Land Use Compatibility Study, Orlando, FL
- Luxury Shopping Mall Construction Noise Monitoring, Bal Harbour, FL
- Marie Selby Botanical Gardens Sound Monitoring, Sarasota, FL
- Michigan Department of Natural Resources Statewide Outdoor Firing Ranges Sound Studies, Michigan
- OCPS Sites 43 and 83 Aircraft Noise Studies, Orlando, FL
- Old Cutler HUD Traffic Noise Study, Homestead, FL
- Ringling College Chiller Plant Sound Study, 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

Appendix B – Additional Information

Relevant Publications

A. Gary W. Siebein Relevant Publications

Natural Soundscapes: A Sonic Exploration of Ichetucknee Springs State Park **2022**
Gary W. Siebein, Keely M. Siebein. Siebein Publishing, Gainesville, Florida: 105 pp

Five Levels of Soundscape Design **2022**
Gary W. Siebein
An ***invited*** paper presented at the 51st International Congress and Exposition on Noise Control Engineering (Inter-Noise 2022). Glasgow, Scotland. August 22, 2022. Proceedings not yet published.

The Soundscape of Restaurants Part 4 Analysis and Practical Design Directions **2021**
Siebein, Gary W., Siebein, Keely, Miller, Jennifer, Vetterick, Matthew, Roa, Marylin.
An ***invited*** paper presented at the 181st Meeting of the Acoustical Society of America. Seattle, Washington. November 2021. The Journal of the Acoustical Society of America 150, A161 (2021); https://doi.org/10.1121/10.0007986

Soundwalks in a Botanical Garden as a Part of the Planning Process **2021**
Siebein, Gary W., Siebein, Keely, Miller, Jennifer, Vetterick, Matthew, Roa, Marylin, Jones, Ian.
An ***invited*** paper presented at the 181st Meeting of the Acoustical Society of America. Seattle, Washington. November 2021. The Journal of the Acoustical Society of America 150, A294 (2021); https://doi.org/10.1121/10.0008337

Soundwalks in New and Existing Intensive Care Units **2021**
Siebein, Gary W., Miller, Jennifer, Vetterick, Matthew, Roa, Marylin, Jones, Ian.
An ***invited*** paper presented at the 181st Meeting of the Acoustical Society of America. Seattle, Washington. November 2021. The Journal of the Acoustical Society of America 150, A294 (2021); https://doi.org/10.1121/10.0008338

The Soundscape of Twenty-First-Century Libraries **2020**
Siebein, Gary W., Paek, Hyun G., Siebein, Keely M., Roa, Marylin. "
Acoustics Today, Volume 16, Issue 4 | Winter 2020, pp 57-66.
https://acousticstoday.org/issues/2020AT/Winter2020/index.html#p=57

Architectural Acoustics and Noise: Architectural Soundscapes **2019**
Siebein, Gary W., Paek, Hyun G., Siebein, Keely M., Siebein, Jr., Gary, Roa, Marylin, Miller, Jennifer R.
An ***invited*** paper presented at the 178th Meeting of the *Acoustical Society of America*. San Diego, California: December 2019. J. Acoust. Soc. Am. Volume 146, No. 4, Pt. 2, p. 3022.

Soundscape of the Evolving Library **2019**
Siebein, Gary W., Paek, Hyun G., Siebein, Keely M., Siebein, Jr., Gary, Roa, Marylin, Miller, Jennifer R.

An ***invited*** paper presented at the 177th Meeting of the *Acoustical Society of America*. Louisville, Kentucky: May 2019. J. Acoust. Soc. Am. Volume 145, No. 3, Pt. 2, p. 1695.

The Soundscape of Music Education **2019**
Siebein, Gary W., Hyun G. Paek, Keely M. Siebein, Gary Siebein, Jr., Marylin Roa, Jennifer R. Miller. "
An ***invited*** paper presented at the 177th Meeting of the *Acoustical Society of America*. Louisville, Kentucky: May 2019. J. Acoust. Soc. Am. Volume 145, No. 3, Pt. 2, p. 1738.

Full Scale Simulation of Soundscapes **2018**
Gary W. Siebein
An ***invited*** paper presented at the 11th *European Congress and Exposition on Noise Control Engineering*. Crete, Greece: May 2018. Euronoise 2018 Conference Proceedings, ISSN: 2226-5147, pp 2479-2486.

Challenges of Entertainment Sound in Communities **2017**
Siebein, Gary W., Siebein, Jr., Gary, Paek, Hyun Paek, Roa, Marylin, Miller, Jennifer R., Siebein, Keely.
An ***invited*** paper presented at the 174th Meeting of the *Acoustical Society of America*. New Orleans, Louisiana: December 2017. J. Acoust. Soc. Am. Volume 142, No. 4, Pt. 2, p. 2483.

Case Studies that Explore the Soundscape of Dining **2017**
Siebein, Gary W., Siebein, Keely.
An ***invited*** paper presented at the 174th Meeting of the *Acoustical Society of America*. New Orleans, Louisiana: December 2017. J. Acoust. Soc. Am. Volume 142, No. 4, Pt. 2, p. 2593.

An Exploration of the Urban Design Possibilities Offered by Soundscape Theory **2017**
Siebein, Gary W., Paek, Hyun G., Siebein, Jr., Gary, Siebein, Keely, Roa, Marylin, Miller, Jennifer R.
An ***invited*** paper presented at the 174th Meeting of the *Acoustical Society of America*. New Orleans, Louisiana: December 2017. J. Acoust. Soc. Am. Volume 142, No. 4, Pt. 2, p. 2670.

The Interactive Multipurpose Performing Arts Hall **2017**
Siebein, Gary W., Paek, Hyun G., Miller, Jennifer R., Roa, Marylin, Vetterick, Matthew.
An ***invited*** paper presented at the 174th Meeting of the *Acoustical Society of America*. New Orleans, Louisiana: December 2017. J. Acoust. Soc. Am. Volume 142, No. 4, Pt. 2, p. 2688.

Multi-Purpose Performance Spaces as Vehicles to Enhance the Acoustical Communities of Cities and Towns **2017**
Siebein, Gary W., Roa, Marylin, Miller, Jennifer R., Vetterick, Matthew
An ***invited*** paper presented at the 174th Meeting of the *Acoustical Society of America*. New Orleans, Louisiana: December 2017. J. Acoust. Soc. Am. Volume 142, No. 4, Pt. 2, p. 2688.

Soundscape Analysis and Modeling of Outdoor Gathering Spaces **2017**
Siebein, Gary W., Paek, Hyun G., Roa, Marylin, Siebein, Jr., Gary, Siebein, Keely.
An ***invited*** paper presented at the 173rd Meeting of the *Acoustical Society of America*. Boston, Massachusetts: June 2017. J. Acoust. Soc. Am. Volume 141, No. 5, Pt. 2, p. 3563.

The Shape of Sound **2017**
Siebein, Gary W., Paek, Hyun G.
An ***invited*** paper presented at the 173rd Meeting of the *Acoustical Society of America*. Boston, Massachusetts: June 2017. J. Acoust. Soc. Am. Volume 141, No. 5, Pt. 2, p. 3661.

Uses of Soundwalks in Computer Modeling of Soundscapes During the Design Process 2015
Siebein, Gary W., Roa, Marylin, Paek, Hyun G., Jones, Paul C.
An ***invited*** paper presented at the 170th Meeting of the *Acoustical Society of America*. Jacksonville, Florida: November 2015. J. Acoust. Soc. Am. Volume 138, No. 3, Pt. 2, p. 1749.

The Soundscape of Worship 2015
Siebein, Gary W., Siebein, Kara A.
An ***invited*** paper presented at the 170th Meeting of the *Acoustical Society of America*. Jacksonville, Florida: November 2015. J. Acoust. Soc. Am. Volume 138, No. 3, Pt. 2, p. 1816.

Types of Soundwalks and their Applications in Soundscape Design and Soundscape Design Techniques 2013
Siebein, Gary W.
An ***invited*** paper presented in at the 166th meeting of the *Acoustical Society of America*. San Francisco, California: December 3, 2013. J. Acoust. Soc. Am. Volume 134, No. 5, Pt. 2, p. 4020.

Architectural Soundscapes 2013
Siebein, Gary
An ***invited*** paper presented at the 6th International Symposium on Temporal Design at the Joint 26th Meeting of the *Taiwan Institute of Acoustics* in Taipei, Taiwan: November 2013. JASA 134:5, 4020-4020.

An Exploration of the Urban Design Possibilities Offered by Soundscape Theory 2013
Siebein, Gary
An ***invited*** paper presented at the *AESOP/ACSP Joint Congress 2013* Planning for Resilient Cities and Regions annual international conference in Dublin, Ireland. July 18, 2013. JASA 142:4, 2670

Creating and Designing Soundscapes 2013
Siebein, Gary
An ***invited*** paper presented at the *European Cooperation in Science and Technology* annual international conference in Merano, Italy. March 22, 2013. COST_TD0804, pp. 158-162.

Propositional Soundscapes 2012
Siebein, Gary W.
An invited paper presented at the 41st International Congress and Exposition on Noise Control Engineering in New York City, NY: August, 2012. Published in Proceedings, pp. 9939-9947.

Defining the Scope of Soundscape Studies 2011
Siebein, Gary W.
An ***invited*** paper presented at the 162nd meeting of the *Acoustical Society of America*, San Diego, California: November, 2011. J. Acoust. Soc. Am. Volume 130, No. 4, Pt. 2, p. 2496.

Applications of Soundscape Design Techniques 2011
Siebein, Gary W.
An ***invited*** paper presented in a special session on Soundscape Design held in conjunction with the 161st meeting of the *Acoustical Society of America*. Seattle, Washington: May, 2011. Published in the *Proceedings.*

Essential Soundscape Concepts for Architects and Urban Planners **2010**
Siebein, Gary W.
An ***invited*** paper presented at the Designing Soundscape for Sustainable Urban Development conference in Stockholm, Sweden. The City of Stockholm hosted the conference as part of the European Green Capital Year. September 30 – October 1, 2010. Published in the *Proceedings,* pp. 26-30.

Architectural and Acoustical Elements of Soundscapes **2010**
Siebein, Gary W.
An ***invited*** paper presented at the 1st European Congress on Sound and Vibration in Ljubljana, Slovenia. September 15-18, 2010. Published in the *Proceedings.*

The Ecological Basis for Architectural and Environmental Soundscapes **2010**
Siebein, Gary W., Tsaih, Lucky, Park, Sang Bum, Siebein, Keely M, Jones, Chris & Skelton, Reece.
An ***invited*** paper presented at INTER-NOISE 2010, the 39th International Congress and Exposition on Noise Control Engineering. Lisbon, Portugal: June, 2010. Published in the *Proceedings.*

Soundscapes vs. Long Term Average Methods of Noise Mapping **2010**
Siebein, Gary W., Bettcher, Adam
An ***invited*** paper presented at the 2nd *Pan-American/Iberian Meeting on Acoustics*, Cancun, Mexico: November 15-19, 2010. Published in the *Proceedings.*

Local Sonic Wonders: Tectonics of Measuring, Modeling, and Mapping Aspects of Soundscapes 2010
Siebein, Gary W., Siebein, Keely M., Tsaih, Lucky, Park, Sang Bum., and Shin, Sang Bong.
An ***invited*** paper presented at the 2nd *Pan-American/Iberian Meeting on Acoustics*, Cancun, Mexico: November 15-19, 2010. Published in the *Proceedings.*

Exploring the Soundscape of Nature **2010**
Siebein, Gary W., Siebein, Keely, Tsaih, Lucky, & Park, Sang Bum.
An ***invited*** paper presented at the 159th *Acoustical Society of America* Meeting, Baltimore, Maryland: April, 2010. Published in the *Proceedings.*

Transitions in Soundscape from Theory to Practice **2010**
Siebein, Gary W.
An ***invited*** paper presented at the 36th German Annual Conference on Acoustics, Berlin, Germany: March, 2010. Published in the *Proceedings.*

On the Nature of the Ambient Sound **2009**
Siebein, Gary W., & Skelton, Reece.
An ***invited*** paper presented at the 38th International Congress and Exposition on Noise-Control Engineering, in Ottawa, Canada in August 2009. Noise-Con Proc., Vol. 218, Issue 1, pp. 2569-2576.

Soundscape Design Applications for Industrial Noise **2009**
Siebein, Gary W., Lilkendey, Robert M., Paek, Hyun G., Jones, Chris, & Robinson, Threcia.
An ***invited*** paper presented at the 38th International Congress and Exposition on Noise-Control Engineering, in Ottawa, Canada in August 2009. Noise-Con Proc., Vol. 218, Issue 1, pp. 2628-2636.

Soundscape Design Methods for a Neonatal Intensive Care Facility **2009**
Siebein, Gary W., Skelton, Reece, & McCloud, Victoria.
An ***invited*** paper presented at the 38th International Congress and Exposition on Noise-Control Engineering, in Ottawa, Canada in August 2009. Noise-Con Proc., Vol. 218, Issue 1, pp. 2360-2368.

Soundscape Design Applications for Entertainment Noise **2009**
Siebein, Gary W., Lilkendey, Robert M., Paek, Hyun G., & Robinson, Threcia.
An ***invited*** paper presented at the 38th International Congress and Exposition on Noise-Control Engineering, in Ottawa, Canada in August 2009. Noise-Con Proc., Vol. 218, Issue 1, pp. 2619-2627.

Case Study of Soundscape Assessment and Design Methods **2006**
Siebein, Gary W., Gold, Martin, Kwon, Youngmin & Smitthakorn, Pattra.
An ***invited*** paper presented at the 35th *International Noise Control Engineers* Conference, Honolulu, Hawaii: December, 2006. The paper was reviewed and published in the *Proceedings.*

An Acoustical Palette for Urban Design **2006**
Siebein, Gary W., Gold, Martin, Smitthakorn, Pattra & Kwon, Youngmin.
An ***invited*** paper presented at the *13th International Conference on Sound and Vibration*, Vienna, Austria: July, 2006. The paper was reviewed and published in the *Proceedings.*

Noise Regulation in Florida **2006**
Siebein, Gary W., Lilkendey, Robert M., & Bentley, Mark
An ***invited*** paper presented at the *Florida Bar* Annual Meeting, Naples, Florida: May, 2006.

Case Studies Addressing Philosophical Uncertainty Issues in Various Acoustical Situations **2005**
Siebein, Gary W., Lilkendey, Robert M.., Paek, Hyun G., & Skorski, Edwin S.
An ***invited*** paper presented at the *International Symposium on Managing Uncertainties in Noise Measurement and Prediction* in Le Mans, France: June, 2005. The paper was reviewed and published in the *Proceedings.*

Estimating Community Noise Levels from Outdoor Condensing Units **2000**
Siebein, Gary W., Kim, Hyeongseok
An ***invited*** paper presented at NOISE-CON 2000 in Newport Beach, California. Published in the Noise-Con Proceedings Vol. 108, Issue 1, pp. 137-142.

Man, Technology and Environment: A Primer in the Environmental Technologies **1985**
Storter Press, Gainesville, Florida: 162 pp.

B. 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 **2004**
Planning and Design
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

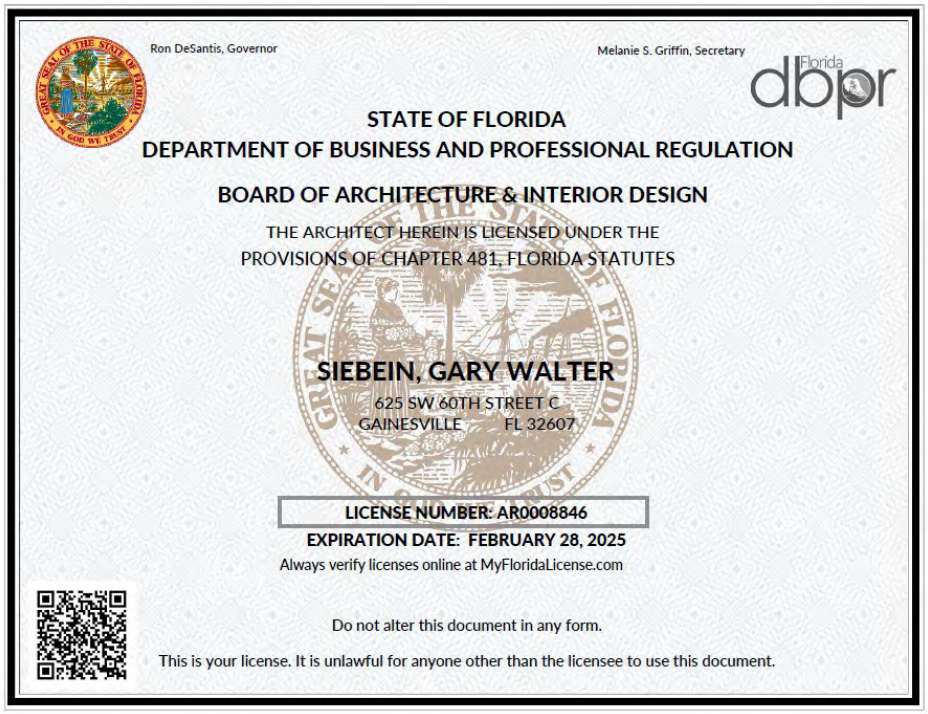
Background Noise Levels in Classrooms 1999
Gary W. Siebein, Martin A. Gold, Mitchell Lehde, and John Ashby. Proceedings from the 137th Meeting of the Acoustical Society of America

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

Architectural Licenses and Certifications for Project Managers and Team Members



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86214
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Has met all requirements for Council Certification and is therefore recommended to all Registration Authorities for registration or license as an architect. Given under our hands and the Seal of the Council, subject to annual renewal.

January 26, 2017
DATE

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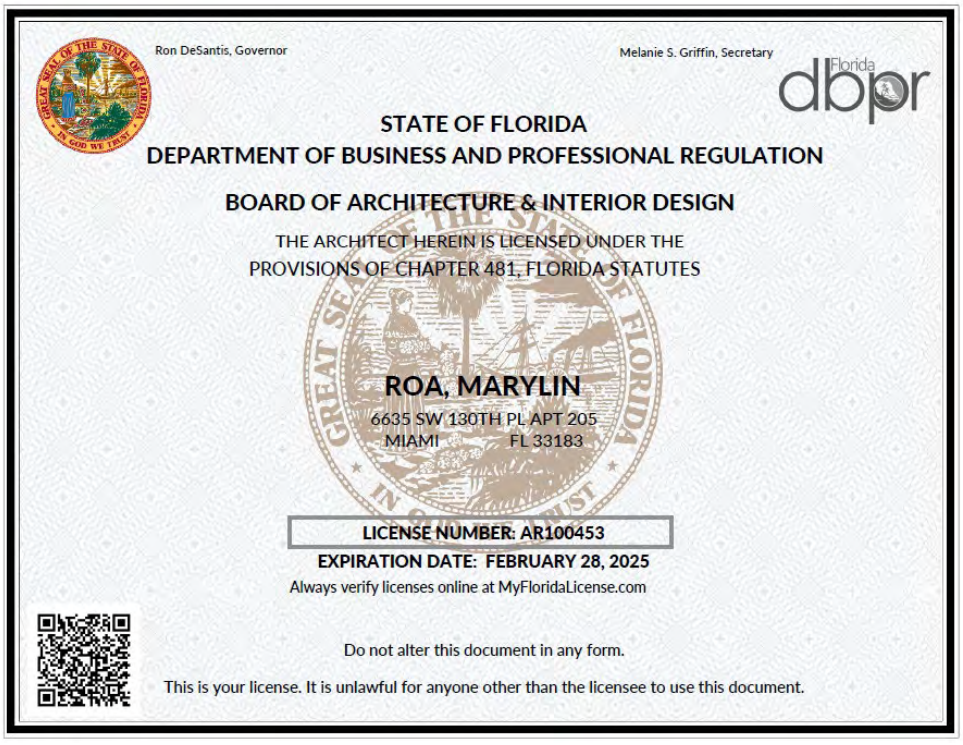

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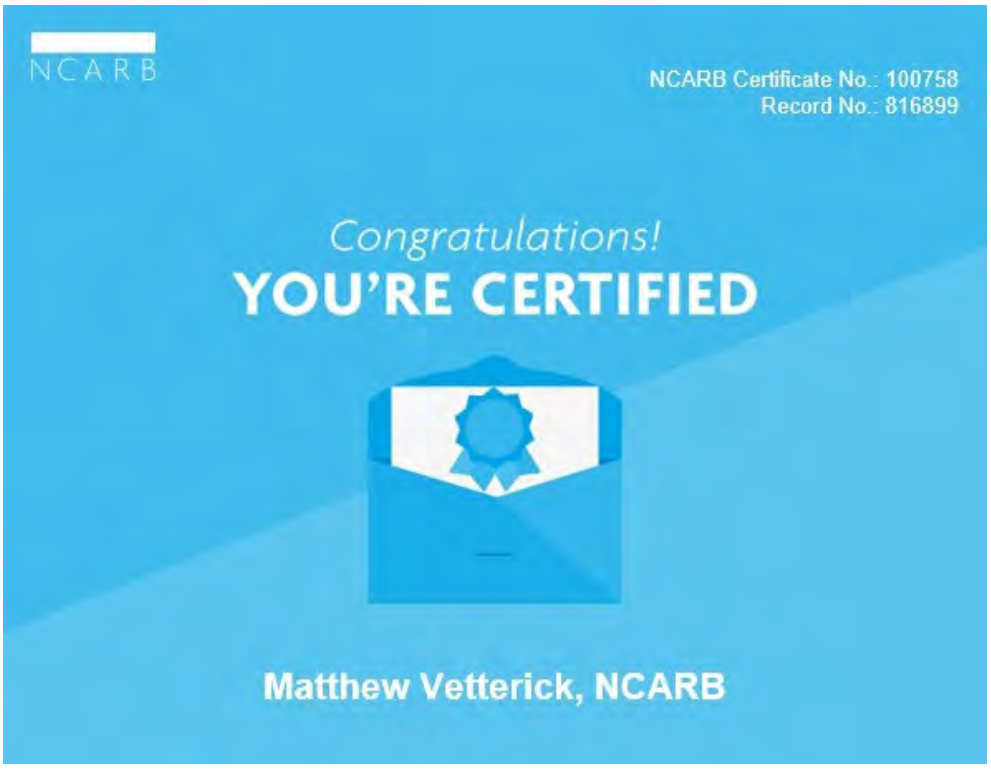

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Keely Siebein

HAS ATTAINED THE DESIGNATION OF

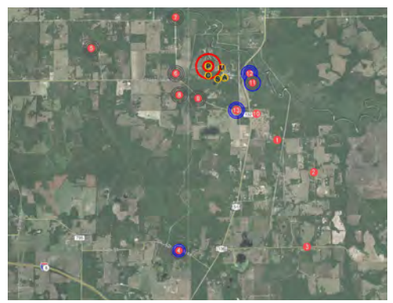
LEED AP® Building Design + Construction

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

PETER TEMPLETON
PRESIDENT & CEO
U.S. GREEN BUILDING COUNCIL & GREEN BUSINESS CERTIFICATION INC.

Siebein Acoustic Soundscape Assessment and Design Portfolio

Please see next pages.



SIEBEIN
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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

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

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

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

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.

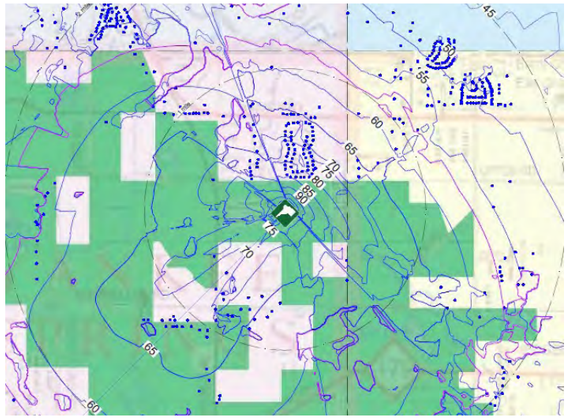
Important components of these projects include:

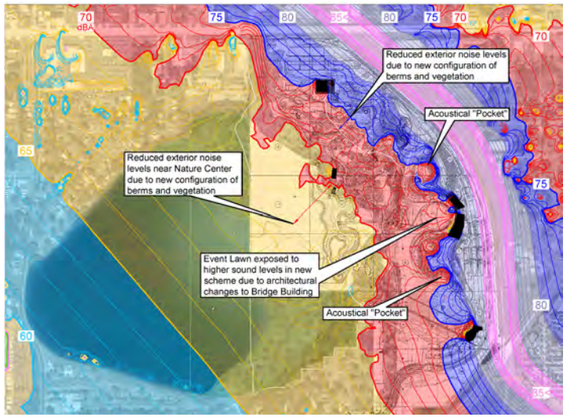
- Measuring ambient or baseline sound levels in rural and urban areas that have multiple constituent sounds;
- Rigorously defining each of the specific acoustic events in long term measurements that comprise the ambient sound in specific locales so the contribution to the ambient is identified; and
-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

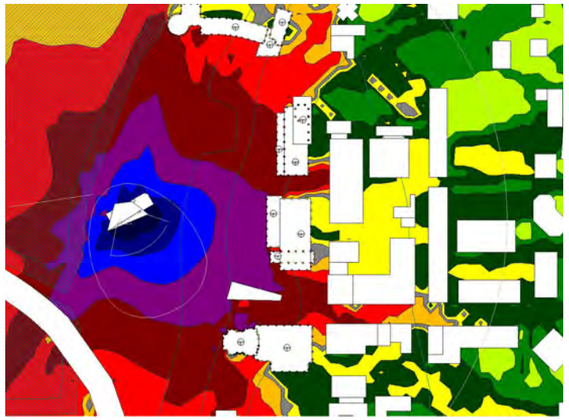
Siebein Associates engages in intelligent processes for each work task that helps to build consensus among multiple stakeholders and can clearly present the rationale for each step in the process. We believe that value engineering and optimizing noise mitigation designs for maximum sound reductions can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

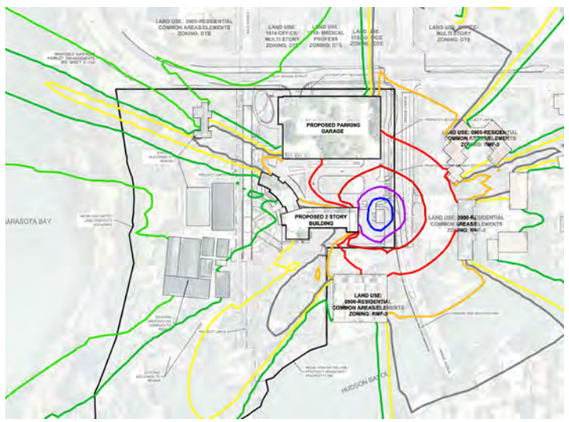
We develop sophisticated computer models that are accurately calibrated to real world situations and have high degrees of explanatory power to build confidence among the multiple parties involved in many acoustical situations.

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.









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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.

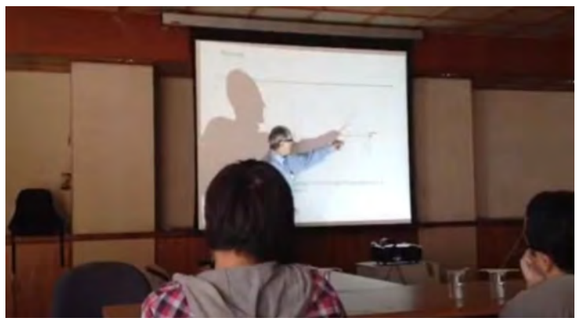
The extensive use of auralizations or actual calibrated listening experiments so stakeholders can listen to the acoustical ramifications of potential mitigation options and visualizations of sounds paths as rays or waves so that the causes of sound issues can be seen are among the methods used to help 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 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, 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.



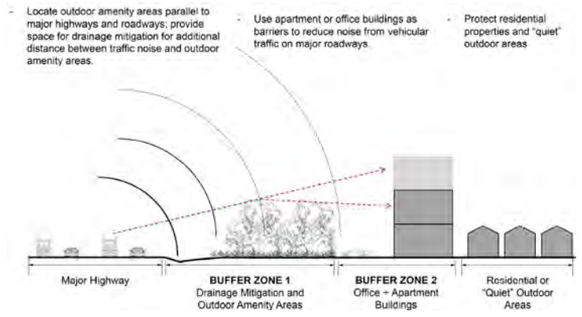
REGULATORY, CONTRACTUAL AND JURISDICTIONAL MATTERS

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.

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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.

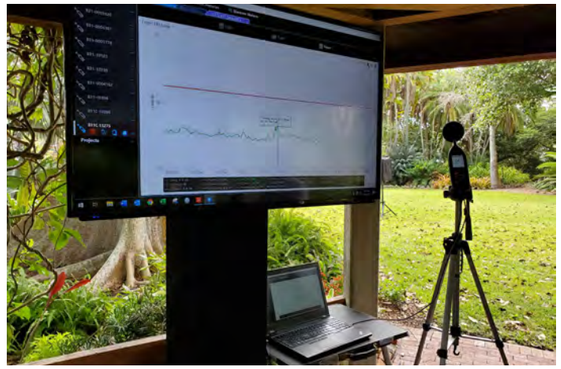
This process can limit the impact of potential noise sources and optimize the points- of-view of all stakeholders with highly creative, technically sophisticated acoustical solutions. We use an interactive process to explore design solutions through a multi-discipline effort that includes the Client,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

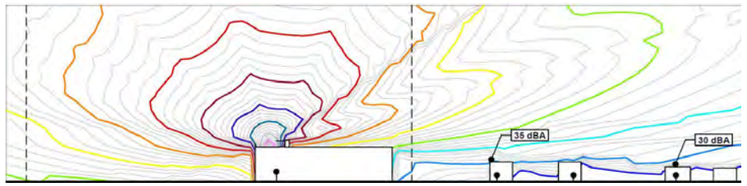
If the situation allows, a weighted sound pressure x impacted property metric can be used as a quantitative method to assess the number and magnitude of impacted properties for a base condition and for mitigation options. This approach has been successfully used to evaluate potential impacts and the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

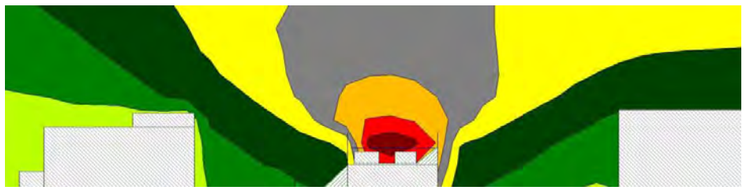


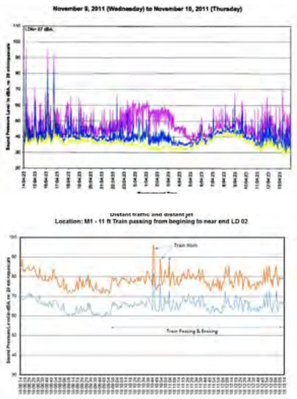
OUR PROCESS

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

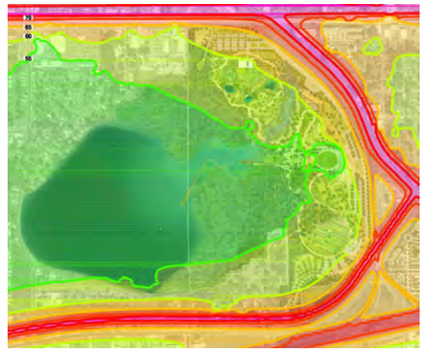
- Project Kick-off, Work Plan and Initial Research
  - Initial Meeting
  - Public Outreach Meetings
  - Developer Meeting
  - Plan Preparations
  - Data Review
  - Literature Review
  - Review Meetings with Stakeholders
- Comprehensive Sound Study
  - Topographical Review
  - Control Survey
  - Event 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



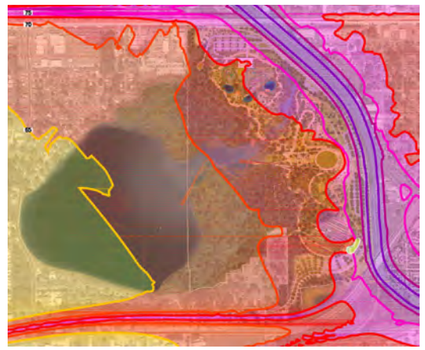




PRELIMINARY SITE NOISE STUDY
VEHICULAR NOISE



PRELIMINARY SITE NOISE STUDY
TRAIN PASSING BY



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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.

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

"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

"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

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

"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.

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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.

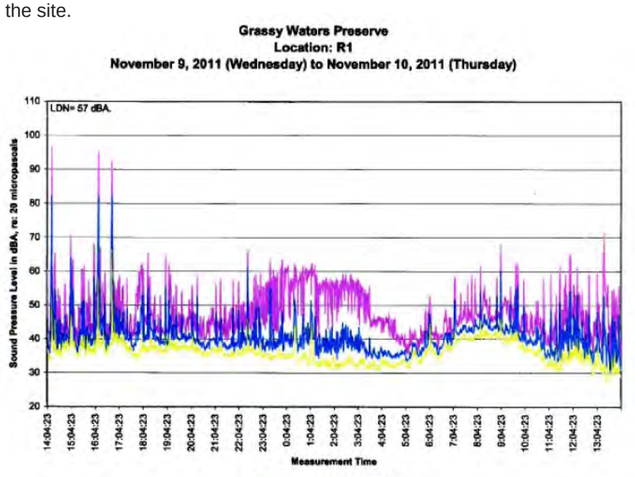
We conducted two types of acoustical measurements in the Preserve. Long term measurements of average sound levels in the preserve were taken to document the general levels and time histories of sounds as they vary over the course of the day and the week at key locations in the preserve. Short term measurements 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.

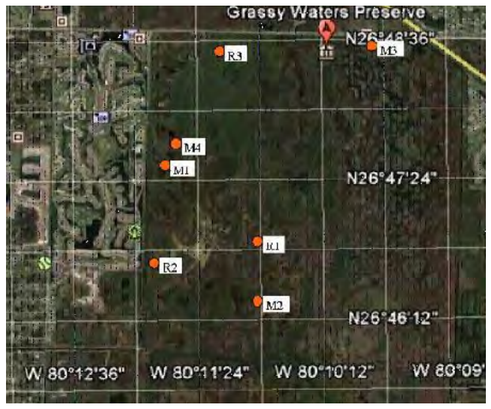
The acoustical measurement locations were selected to represent the acoustical zones of the site. The acoustical zones consisted of areas dominated by traffic noise; public use areas including board walks and pavilions on the paths of the site accessible by land; and locations within the preserve at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

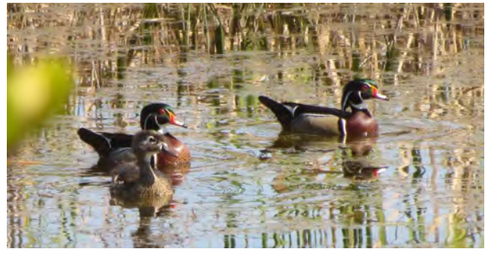
We also conducted a traffic noise study involving present and future predicted traffic conditions and constructed computer models to determine noise mitigation design for present conditions as well as future predicted conditions.

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.

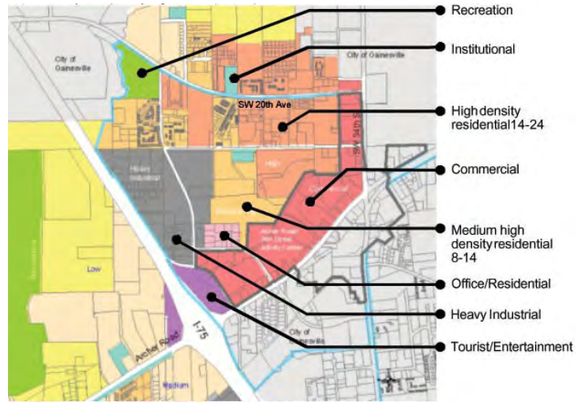
The community was acoustically characterized and analyzed by means of quantitative measurements and qualitative assessments by observation. The measurements included instantaneous, 1-minute short-term and 24-hour long-term measurements. The parameters involved in these measurements are A-weighted average 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.

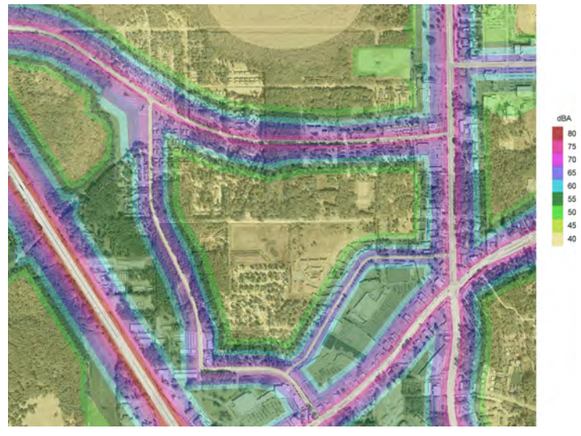
It was found that the project area was dominated mostly by traffic noise coming from several major transit roads including an interstate highway. Fire alarms coming from a fire station that is in the middle of the project area occasionally intruded upon the community. Particularly after a few planned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





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City of Greenville Urban Soundscape Study

Greenville, South Carolina

Greenville, South Carolina has a thriving revitalized mixed-use downtown core with a combination of historic buildings, modern mixed-use occupancies, retail establishments, hotels and performing and visual art spaces making it an exciting and engaging soundscape. The area has been thoughtfully designed and planned with shaded sidewalks and on-street parking making access to the urban core convenient for visitors.

Siebein Associates, Inc. provided a sound study of the downtown area to assist the City in understanding the complexities of the soundscapes and how they changes from morning, to afternoon and evening.

We conducted acoustical measurements during a seriies of soundwalks in areas determined by the City. Our consultants conducted acoustical analysis of the measurement data and provided acoustical design recommendations to assist in determing appropriate adjustments to the noise ordinance and other noise related planning documents for the City and to maintain the compatibility of the various sound sources and venues in Greenville.

City of Fort Lauderdale Urban Soundscape Study

Fort Lauderdale, Florida

Siebein Associates along with the University of Florida School of Archtiecture and the Florida Atlantic University School of Architecture formed a Soundscape Team to sustainably and comprehensively address the complex soundscape of Fort Lauderdale's dense mixed-use urban core.

We utlized 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 neighborhoods in the City of Fort Lauderdale. We employed 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 urban soundscape. We used 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.

image credit City of Fort Lauderdale

image credit Walker and Dunlop

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 Soundscape Team involved 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.

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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.

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Bonnet Springs Park Soundscape Design and Planning

Lakeland, FL

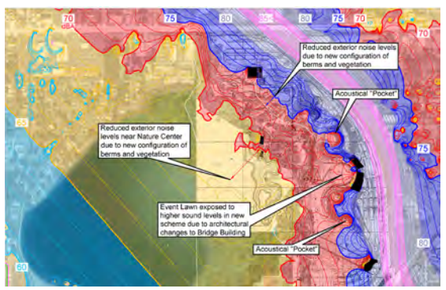
This 180-acre urban park has a Welcome Center, Nature Center, Children's Museum, Event Center, a botanical garden, a full-service restaurant, an event lawn with amphitheater for concerts and festivals, a tree house, a tea house, a nature playground, and many walking and bike paths.

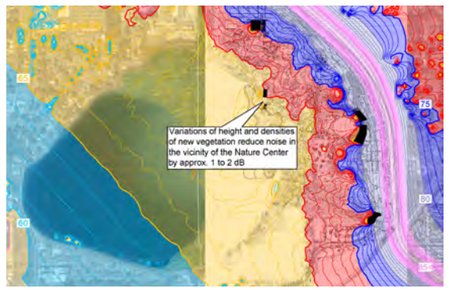
Siebein Associates provided soundscape concept design and planning strategies for the park as a whole including a sonic design charette to discuss intentions and strategies with the Design Team and user groups and to draw out issues and approaches for consideration as the project progresses.

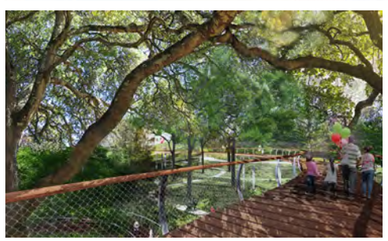
Our consultants conducted base line sound and vibration measurements of the rail, road traffic and industrial noises near the site as well as the more pleasant, atmospheric sounds of the lake, neighborhoods and marshes that currently exist.

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

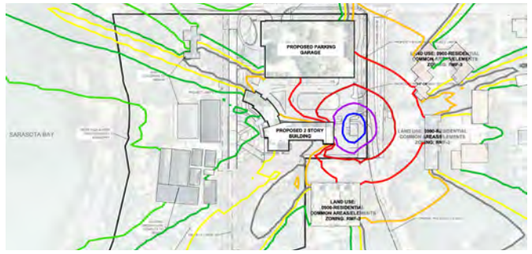
The Marie Selby Botanical Gardens is a 15-acre oasis located in downtown Sarasota. It is dedicated to education, research and conservation of orchids, bromeliads, gesneriads, epiphytes and tropical plants. Visitors can explore a rainforest garden, tropical conservatory, bamboo garden, banyan groves featuring 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.

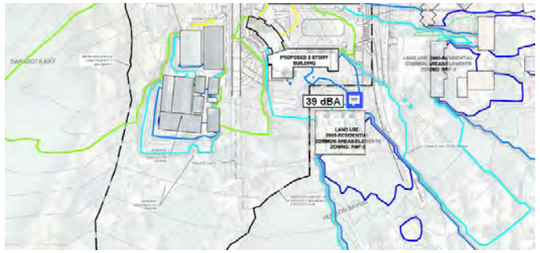
In an effort to grow the walkable garden space and to protect the scientific collection from future sea level rise, the institution planned a $92 million expansion plant research building, a solar-powered rooftop restaurant and a recreational trail. The expansion plan was designed to increase garden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

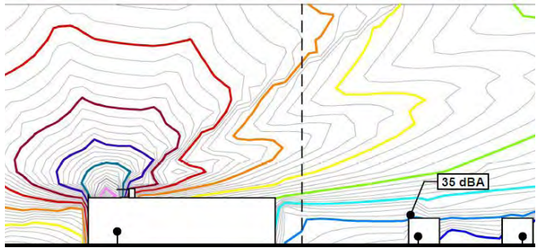
The gardens are surrounded by residential and mixed-use properties. Residents were concerned about the increased level of noise that would be generated by the new buildings and increased traffic.

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.







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625 NW 60th Street, Suite C Gainesville, Florida 32607
Telephone : (352) 331-5111 Website: www.siebeinacoustic.com

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.

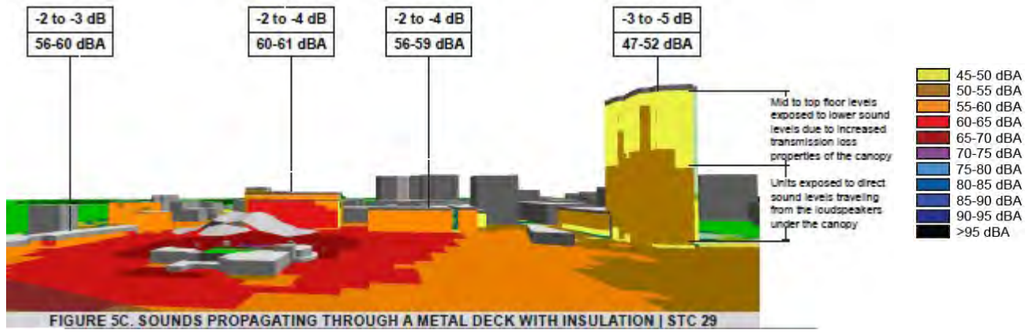
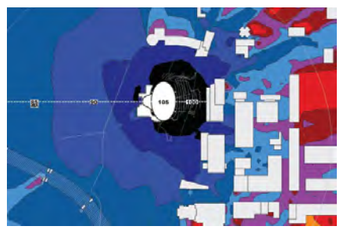
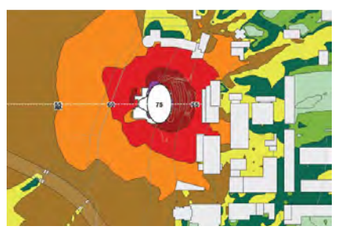
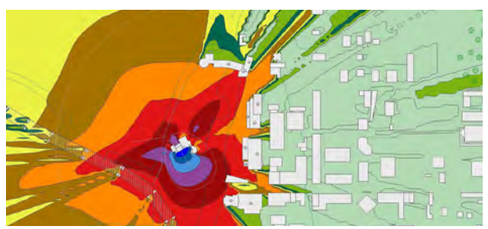


FIGURE 5C. SOUNDS PROPAGATING THROUGH A METAL DECK WITH INSULATION | STC 29







The Villages Florida Turnpike Planning

The Villages, FL

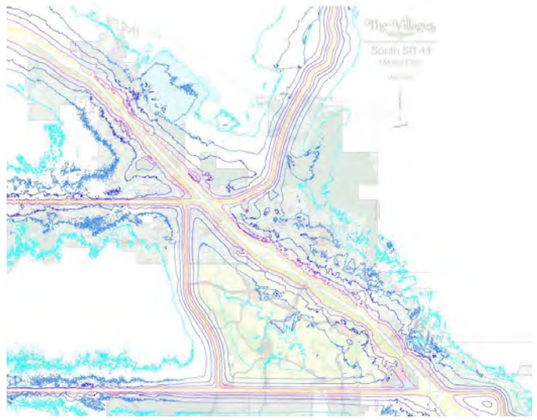
The Villages, located in central Florida, is one of the fastest growing 55+ retirement communities in the United States, growing more than 37% since 2010 to over 122,000 residents.

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.



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625 NW 60th Street, Suite C Gainesville, Florida 32607
Telephone : (352) 331-5111 Website: www.siebeinacoustic.com

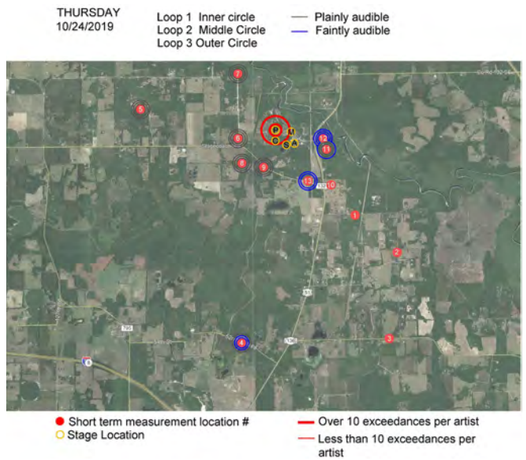
Suwannee Hulaween Event Noise Monitoring

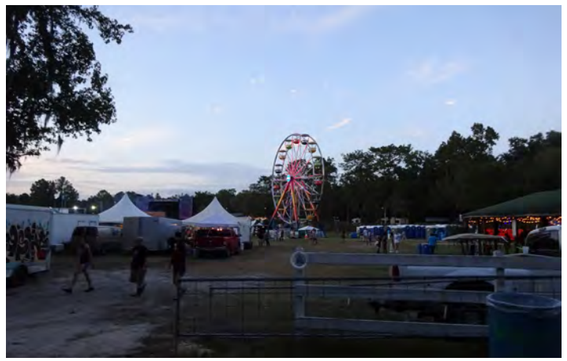
Live Oak, FL

The Spirit of the Suwanee 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 it's 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.

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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

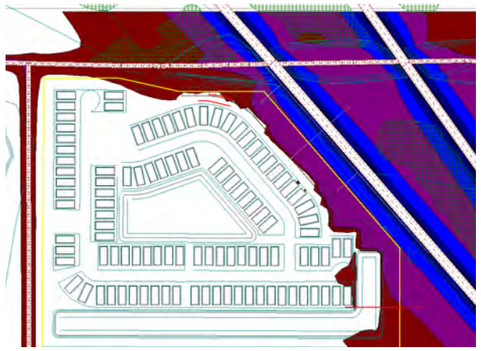
Siebein Associates conducted a site noise study using the HUD site noise assessment tool We also provided acoustical design recommendations for a noise barrier wall design to meet HUD recommendations for reducing traffic noise levels to 65 dBA or less.

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.

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625 NW 60th Street, Suite C Gainesville, Florida 32607
Telephone : (352) 331-5111 Website: www.siebeinacoustic.com

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

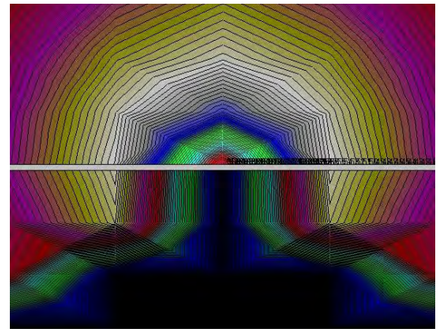
Aaron Bessant Amphitheater is an outdoor performance space located in the center of Pier Park, a park with walking trails and a war memorial adjacent to a major shopping area and the Gulf of Mexico in Panama City Beach. The amphitheater is used to bring in a variety of regional and national talent who 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.



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625 NW 60th Street, Suite C Gainesville, Florida 32607
Telephone : (352) 331-5111 Website: www.siebeinacoustic.com

Amphitheater Noise Impact Analysis

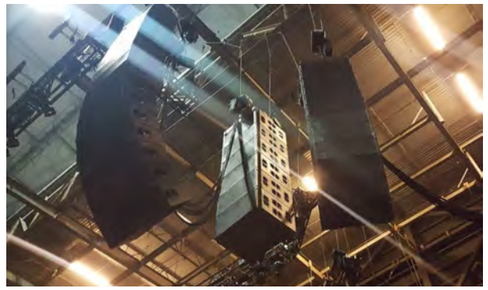
Tampa, FL

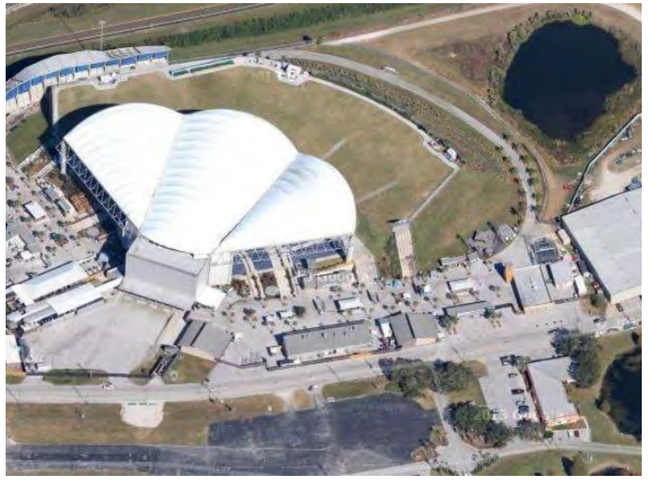
Amplified rock concerts at a 20,000 seat amphitheater in Tampa, Florida were disturbing residents up to 4 miles away. Siebein Associates assisted the Hillsborough County Environmental Protection Commission and their technical and legal staffs in a number of legal actions against the amphitheater operator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

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

Sarasota, FL

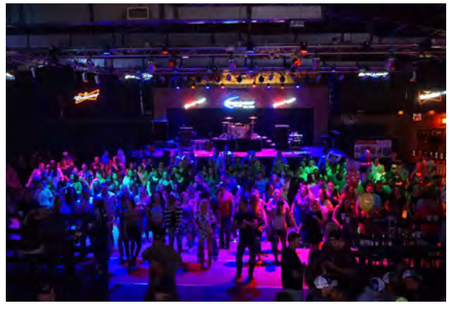
Citizens in the City of Sarasota raised concerns to the City Commission that noise propagating from a number of entertainment establishments was creating disturbances in their homes particularly late at night. Law enforcement officers generally found that the sounds complied with the existing noise ordinance,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

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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.

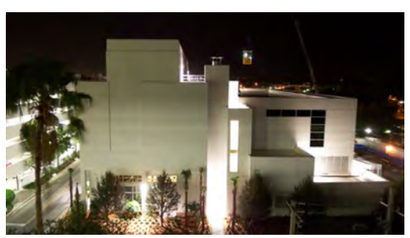
The potential noise impacts of several alternative design options and noise mitigation strategies for the cooling towers were modeled. A presentation to the residents that included estimated cooling tower sounds in the presence of ambient neighborhood sounds played through loudspeakers in an auditorium 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

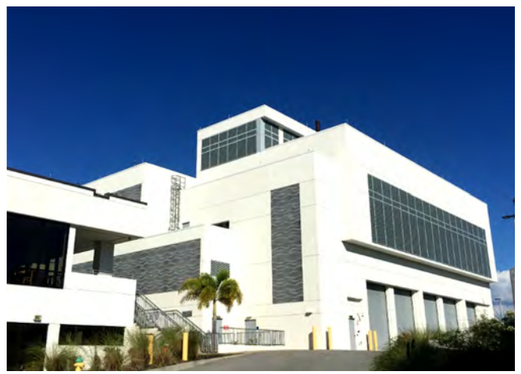
Siebein Associates provided a preliminary concept narrative of the acoustical requirements for the new Central Utility Plant at the Mease Countryside Hospital in Safety Harbor, Florida including acoustical recommendations for cooling towers, emergency generators, pump/boiler/chiller rooms and vibration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



SIEBEIN ACOUSTIC

625 NW 60th Street, Suite C Gainesville, Florida 32607
Telephone : (352) 331-5111 Website: www.siebeinacoustic.com

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

625 NW 60th Street, Suite C Gainesville, Florida 32607
Telephone : (352) 331-5111 Website: www.siebeinacoustic.com

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VISUAL ESSAY AND LAYOUT PLAN

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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Soundscape; simulation; chiller plant; quiet neighbourhood

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

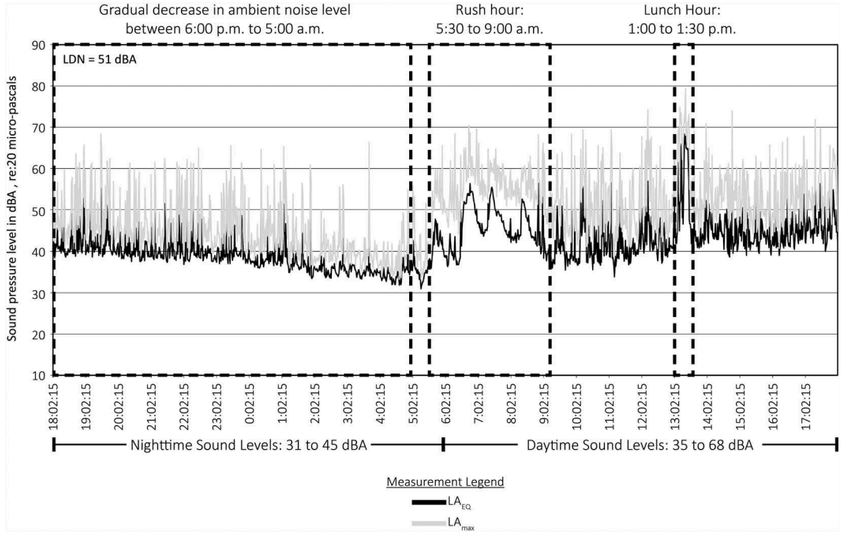

Figure 1. Graph showing sound levels measured during one of the seven days at location R1 (Acoustical events that define the character of the site are shown inside a dashed box).

CONTACT Marylin Roa mroa@siebeinacoustic.com Siebein Associates, Gainesville, FL

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

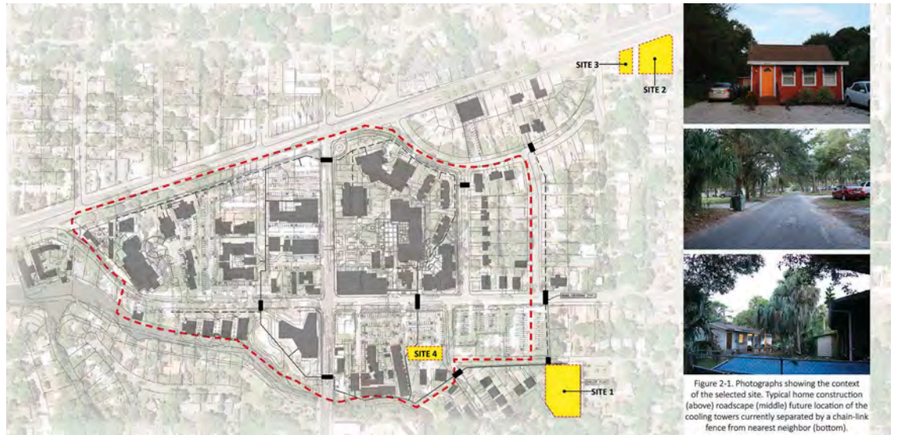

Figure 3. Site plan showing locations of various sites that were considered by the Architect and Client in an attempt to minimize noise impact to neighboring properties. Site 1, the original project site, remained as the project site after the site selection study was conducted because of its central location to existing and future pipping 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.

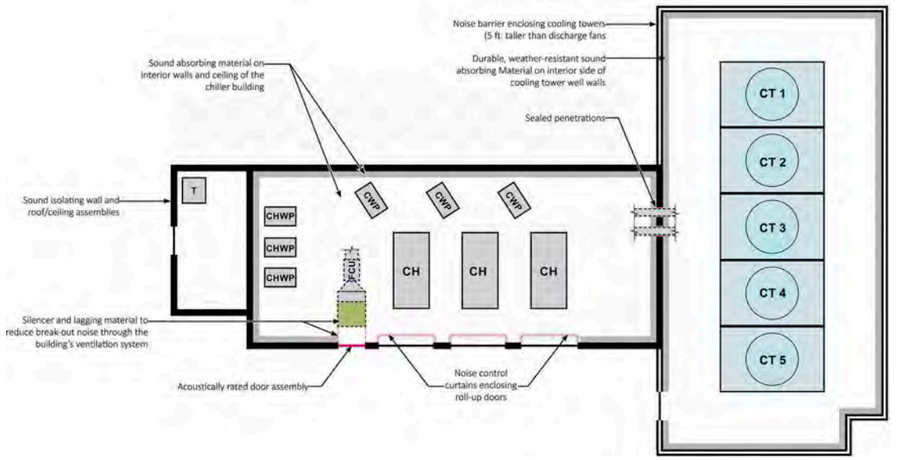

Figure 4. Floor plan of the proposed chiller plant indication the locations and types of acoustical interventions designed to reduce off-site noise propagation. There are five cooling towers (CT) in a sound-absorbing enclosure that extends 5 ft. above the top of the discharge fans. There are three chillers (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

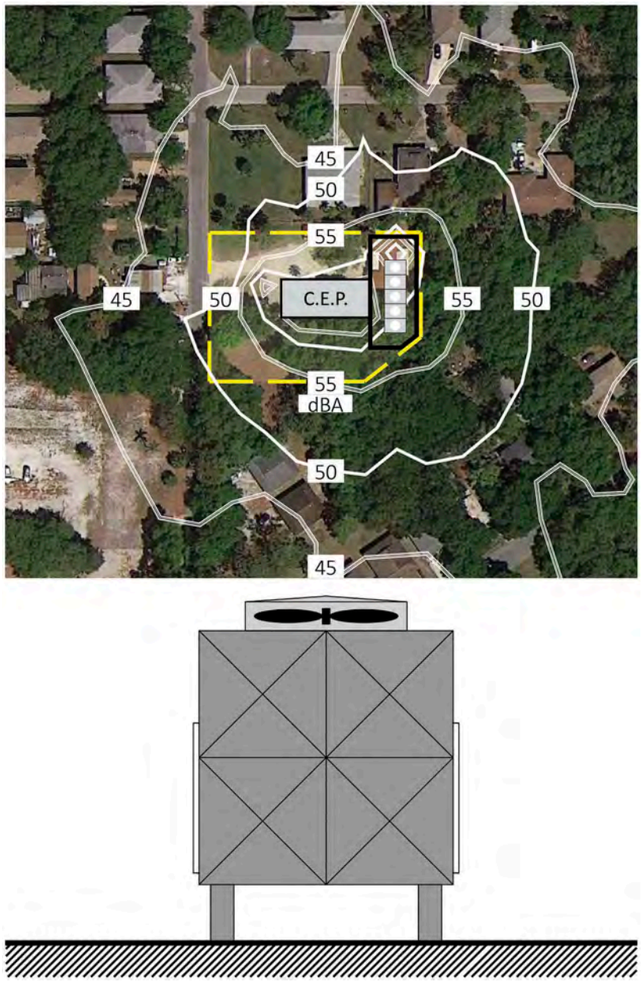

Figure 5. The noise contour plot (above) shows the resulting noise contours for the chiller plant equipment and the basis of design cooling tower selection (scheme 1).

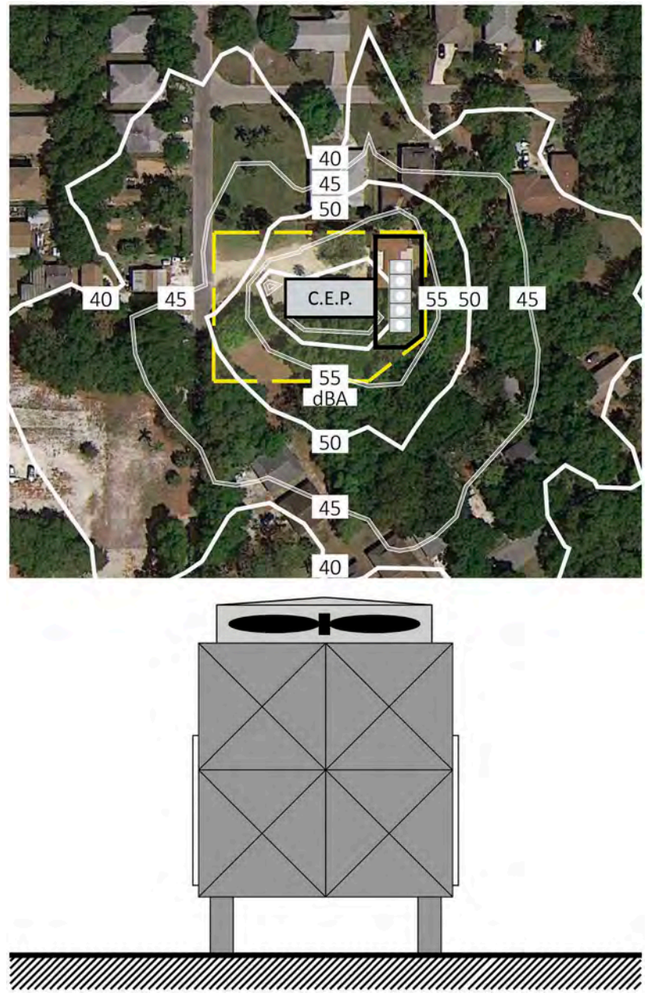

Figure 6. The noise contour plot (above) shows the resulting noise contours for the chiller plant equipment and cooling towers with ultra-quiet fans (scheme 2).

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 plan next to the chillers and pumps (Figure 10), and outside the large

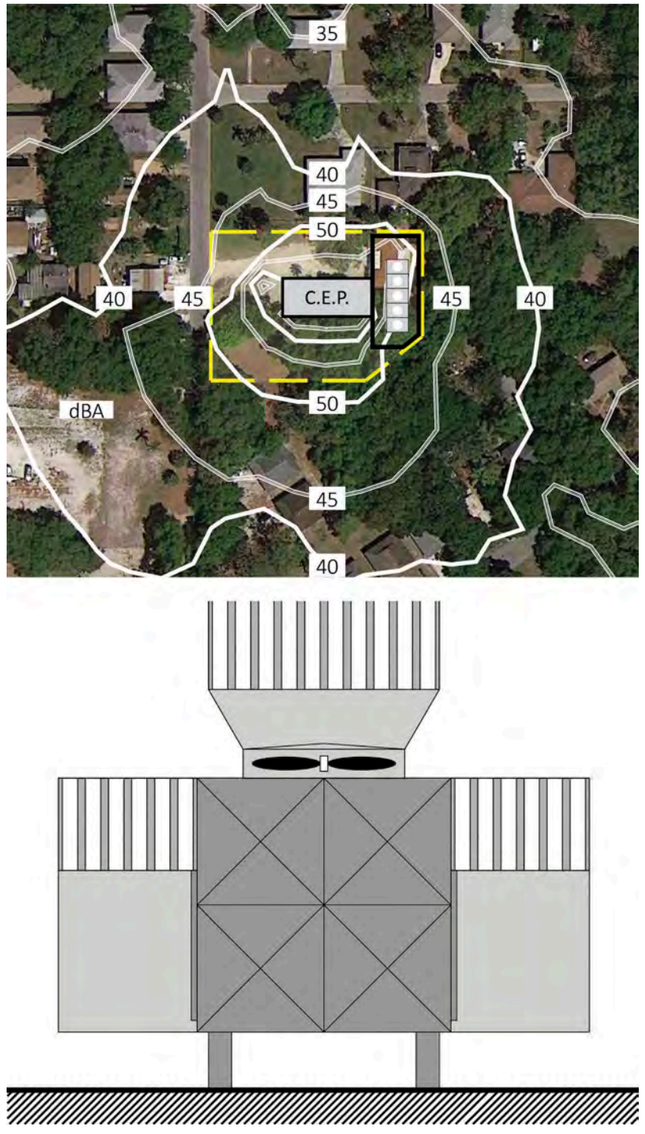

Figure 7. The noise contour plot (above) shows the resulting noise contours for the chiller plant equipment and the basis of design cooling tower selection (scheme 1).

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

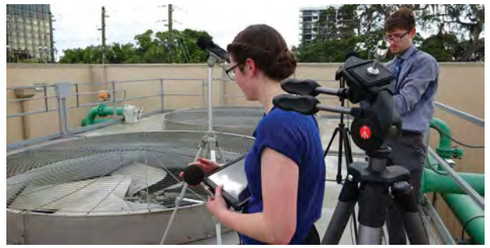

Figure 8. Acoustical measurements and recordings of the cooling tower fans taken at an existing facility similar to the proposed central energy plant.

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.

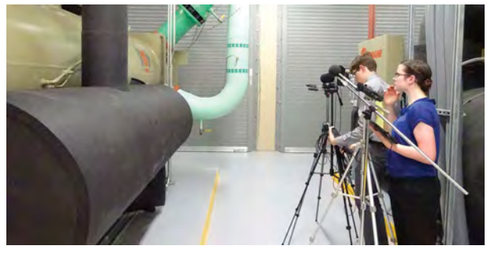

Figure 10. Acoustical measurements and recordings of the chillers and pumps inside an existing facility similar to the proposed central energy plant.

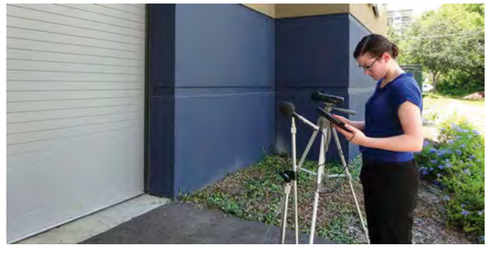

Figure 11. Acoustical measurements and recordings of sound propagating through the roll-up doors at an existing facility similar to the proposed central energy plant.

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

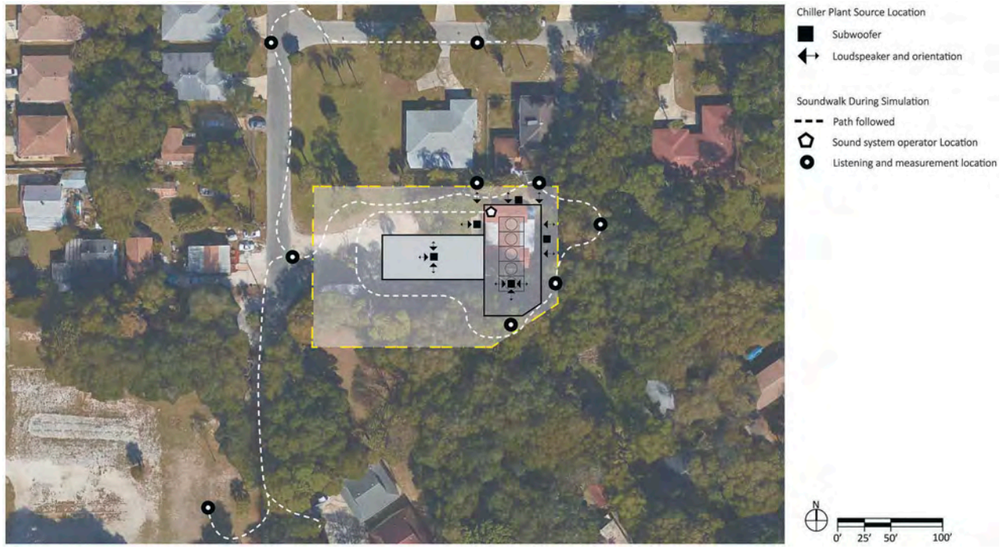

Figure 12. Aerial map showing the path (dashed line) taken during the simulation of the chiller plant. The location of the chiller building and cooling towers are shown for reference. A total of nine listening locations are indicated by the circles on the map Sound levels from insect noise and air conditioning 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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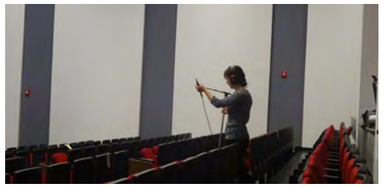
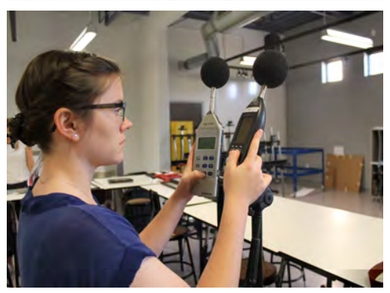






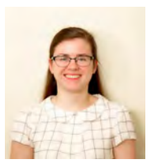
RITA SIEBEIN
President
RSiebein@SiebeinAcoustic.com
352-331-5111, ext. 21

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

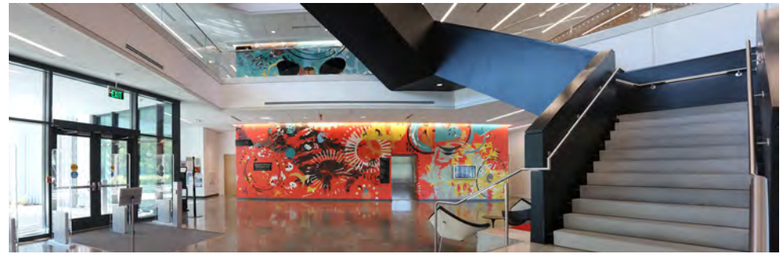
GARY SIEBEIN, JR.
Senior Consultant
Gary@SiebeinAcoustic.com
352-331-5111, ext. 19

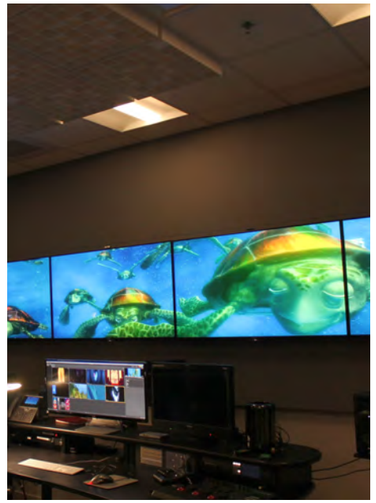


JENNIFER MILLER
Senior Consultant
JMiller@SiebeinAcoustic.com
352-331-5111, ext. 12

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



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