

Outlook

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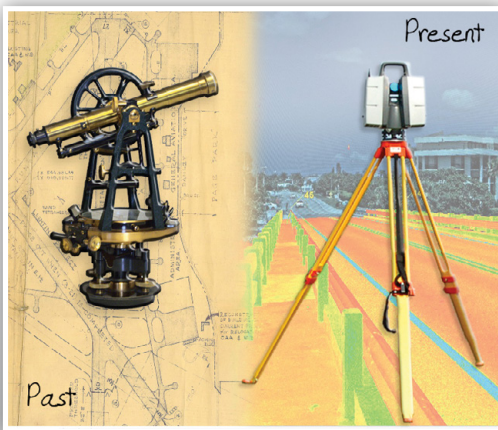
"Your project. Our passion."

ADDING CUTTING EDGE LASER TECHNOLOGY TO OUR SURVEY ARSENAL

Over the last 70 years our survey methodology has adapted to the ever-changing environment. We are constantly evaluating and applying the newest surveying and mapping methods available.

Land surveying technology has advanced throughout the last 70 years since the time our company founder, Carl Johnson, used a compass, a level, a chain, and a transit to measure distances between two line-of-sight points. In addition to these multiple tools, these surveys couldn't have been performed without first clearing a path between the two points, making this survey method difficult and tedious.

Thanks to advancements in technology, land surveying has become more precise and accurate, not to mention faster and less cumbersome. Around 1960 the availability of the electronic distance measuring (EDM) device made work a bit easier by using electromagnetic energy to determine the line-of-sight distance between an instrument and a reflector. This allowed surveyors to measure longer distances in a shorter amount of time, without having to remove as much vegetation and brush which may have hindered the line-of-sight. This method was used throughout the 1960s, 70s, and 80s.



Over the last 70 years, survey methodology has changed dramatically. Today we can offer 3D laser scanning to produce virtual images of real world scenes with precise measurements.

It wasn't until the 1990s when the surveying and mapping industry began to take advantage of global positioning systems (GPS). This method dramatically increased productivity and resulted in more accurate and reliable data. GPS eliminated the need for line-of-sight visibility between survey stations and allowed surveyors to carry GPS

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Expanding our
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Balancing New
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Preservation



Proactive Approach
to Maintaining
Your Roadways



PEOPLE & PROJECTS: ON THE MOVE



Heidi Siegel, AICP joined our planning team in the Pembroke Pines office. As a former city manager in Miami-Dade County, she has 18 years of experience working with South Florida land use.



Jonathan Barbosa-Justiniano, P.E. recently joined our team as a project engineer. He will utilize his experience working for Puerto Rico Aqueduct and Sewer Authority (PRASA).



Jessica Ward joined our environmental team in the Pembroke Pines office. She has nearly 17 years of experience as a biologist in Florida, specializing in coastal and marine environs.



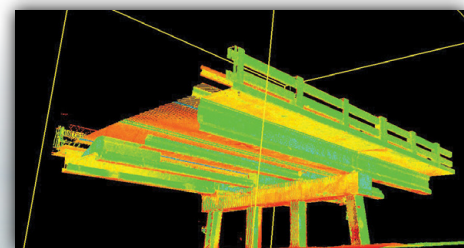
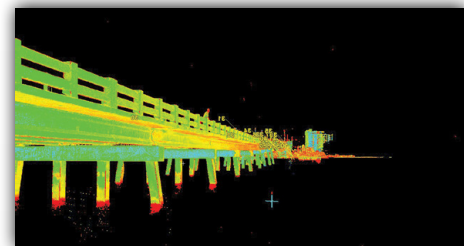
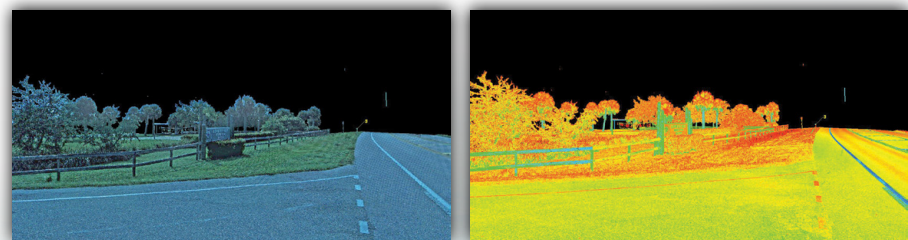
systems in backpacks or mount them on vehicles to provide instant data collection and the ability to communicate wirelessly, delivering continuous, accurate, real-time data.

The 21st century brought additional surveying and mapping capabilities, such as subsurface utility excavation (SUE) and hydrographic surveying. Our team acquired a customized StarVAC soft dig vehicle which uses a combination of pressurized water and high vacuum suction to efficiently remove soil to locate, identify, and map underground utility lines. SUE technology significantly helps to eliminate utility conflicts on many projects and lower construction costs.

In the early 2000s our team started providing hydrographic surveys which allowed us to expand our surveying services to water bodies as well as land. Although hydrographic surveying technically started back in the early 1900s, the modern day hydrographic surveying uses GPS and a sonar depth recorder with software to produce virtual digital terrain maps of the underwater topography.

Keeping with our top notch services, we have expanded our surveying capabilities yet again with the addition of 3D laser scanning. This cutting edge technology quickly captures three-dimensional spatial data and produces a virtual image of a real world scene using precise laser measurements. This gives members of the project team the ability to see an accurate 3D model of the site to determine early on if the proposed design functionally works with the existing conditions. The program allows planners and designers to visually maneuver the image to show areas surveyed and superimpose the digital photos taken during the scan in order to visualize the actual conditions.

In addition to gathering data faster and more accurately, the 3D laser surveying also reduces the amount of time required in the field. Together with its ability to enhance the design process and reduce data collection errors, it's a huge benefit for our team and our clients. For more information, contact Mark Texter at (239) 461-2433 or mtexter@johnsoneng.com. ■



Johnson Engineering surveyors perform a survey using 3D laser scanning along Estero Blvd. from Little Carlos to Big Carlos Bridge at Lovers Key/Carl E. Johnson State Park.

OUR ENVIRONMENTAL TEAM CAN BE FOUND ON LAND AND SEA

Johnson Engineering has expanded our marine capabilities. In addition to our aquatic ecologists with unique experience in seagrass restoration, we now offer a range of marine biological services, including benthic habitat mapping, coral reef monitoring, artificial reef studies, sea turtle expertise, and marine impact assessments. Our marine experts have provided permit support for a variety of coastal projects including inlet management, beach nourishment and placement of shore protection structures, utilities, dock construction, and ports and marinas. These capabilities allow us to provide a full suite of environmental services to our



Johnson Engineering ecologist Sarah Webber taking water quality measurements in the 10,000 Islands area.

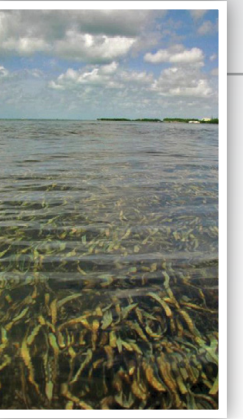
clients for large projects spanning terrestrial and coastal environments with a "one-stop shop" approach that covers the entire project cycle and streamlines management.



Threatened coral *Acropora palamata* in Biscayne National Park.

Specific capabilities include:

- ▬ Joint Coastal Permit (JCP) and Environmental Resource Permit (ERP) support
- ▬ Regulatory agency coordination
- ▬ NEPA
- ▬ ESA Section 7 consultation
- ▬ Essential Fish Habitat assessment and consultation
- ▬ Reef fish census
- ▬ Estuarine fish capture studies
- ▬ Marine habitat mapping and GIS deliverables
- ▬ Before-After, Control-Impact (BACI) studies
- ▬ Artificial reef design and monitoring for habitat equivalency
- ▬ Coral relocation and restoration
- ▬ Seagrass impact studies and restoration
- ▬ Dune and coastal planting plans
- ▬ Mangrove creation/mitigation design
- ▬ Water quality monitoring
- ▬ Protected species assessments



Seagrass (*Thalassia testudinum*) in the Florida Keys.

For more information, contact Jessica Ward at jward@johnsoneng.com. ■

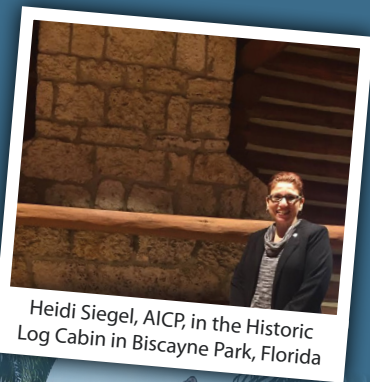
BALANCING NEW DEVELOPMENT AND HISTORIC PRESERVATION

Johnson Engineering understands that there is a lot of value in historic preservation for both local cities and private developers. Our new Senior Planner, Heidi Siegel, AICP, holds a Master's Degree in Historic Preservation from Georgia State University and has worked in historic preservation in Broward and Miami-Dade Counties, as well as Atlanta and Alaska. Heidi understands both historic preservation and new development and is able to balance both while maximizing the results for her clients.

The incorporation of historic buildings into master plans, zoning ordinances, and redevelopment projects automatically creates a sense of place, promotes local pride and tourism, and is good for the environment! That's right...historic preservation is the original sustainable development. The adaptive reuse of historic buildings minimizes the use of new construction materials. According to the National Trust for Historic Preservation Sustainability Initiative, the construction of a new 50,000 square foot commercial building takes the same energy as driving a car for 20,000 miles a year for over 700 years. Reusing historic buildings for modern uses also avoids demolition waste in landfills. Additionally, historic buildings often were designed to maximize heating and cooling through site orientation and natural air flow.

There are many ways that cities can incentivize developers to save historic buildings once they make historic preservation a goal. Tax credits, transfer of development rights, and waiver of some development regulations are just some of the tools available.

Johnson Engineering is prepared to assist you with your historic preservation needs. For more information, please contact Heidi Siegel, AICP at hsiegel@johnsoneng.com. ■



Heidi Siegel, AICP, in the Historic Log Cabin in Biscayne Park, Florida



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MAINTAINING HEALTHY ROADWAYS

As a primary means of moving goods and people, our existing roadway networks are vital to the health of our community and economy. Much like our personal health, the effectiveness of the existing system is often taken for granted and issues are addressed only after they've become problems. Reactive maintenance programs are expensive. In order to maintain a healthy and financially sustainable roadway system a proactive approach is critical.

Over 90% of the roads in America are paved with asphalt. A petroleum product, Asphalt Cement (AC), over time and with exposure to sun, will oxidize causing the pavement to lose its flexibility, becoming brittle and more susceptible to stress. Even with low traffic loadings, all asphalt pavements will eventually deteriorate and crack. Once cracking occurs water can infiltrate the underlying base, greatly reducing the structural capacity of the overall pavement section and lead to larger base failures such as settlement and potholes. Once at this stage, the remedies become expensive. The key is to be proactive and avoid the significant failures by utilizing various preventative maintenance techniques. This will extend the life of your roadway and reduce your overall life-cycle costs.

So what to do about your road? Like personal healthcare products, there are a multitude of products and processes on the market today. All of these products, including chip seals, fog seals, slurry seals, and crack seals, promise to restore the vitality and youthful appearance of your asphalt pavement. For the more advanced aging problems there is milling and resurfacing, micro-surfacing, full depth reclamation, and in-place recycling. Each of these can provide a specific benefit with the proper application; however, all come with a cost. Unfortunately, there is not one magic solution. Various factors such as pavement condition, age, mix design, location, traffic loading, and intended use must be taken into consideration. As with our personal health, a short-term diet provides only short-term benefit. Long-term health requires a long-term commitment. With aging pavement the answer is not typically a singular product or process. The true solution is a maintenance program.

Johnson Engineering has been providing roadway pavement analyses for various entities for many years. If you have a roadway system, young or old, and would like help in determining an appropriate program to keep it healthy while minimizing your long term costs, contact Ryan Bell, P.E., PTOE, at rbell@johnsoneng.com. ■



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