

PUBLIC WORKS COMMITTEE

9:00 a.m., Thursday, November 8, 2018

Council Chambers

1207 Palm Boulevard, Isle of Palms, South Carolina

AGENDA

1. Call to order and acknowledgement that the press and public were duly notified of the meeting in accordance with the Freedom of Information Act
2. **Approval of Previous Meeting's Minutes**
Regular Meeting of October 4, 2018
3. **Citizens' Comments**
4. **Department Reports for October 2018 – Director Pitts**
Vehicle Maintenance and Trash Collection Tracking Reports
5. **Old Business**
 - A. Update on Phase II Drainage project
 - B. Update on removal/replacement of underground storage tanks at Public Works site
 - C. Update on trash cans with lids on the beach
 - D. Update on ditches and drainage issues
 - at 21st – 22nd Avenues
 - at 31st – 32nd Avenues
 - between 30th and 31st Hartnett
 - 32 Thirty-second Avenue
 - 267 Forest Trail
 - E. Consideration of assignment of City's contract with Schupp Enterprises to JLG Enterprise
 - F. Consideration of expanding plastics ban and differences between the Isle of Palms ordinance and the ordinances for Mount Pleasant and Sullivan's Island
6. **New Business**
 - A. Consideration of recommendation from the Planning Commission to award a contract to Thomas & Hutton for Phase III Drainage project – Presentation by Thomas & Hutton
 - B. Discussion of Memorandum of Understanding between the City and the IOP Water and Sewer Commission regarding extension of public sewer throughout the island
 - C. Discussion of improving the beach access paths
 - D. Consideration of increasing the landscape contract to include some beach access paths during the summer months
 - E. Discussion of Eadie's work on 41st Avenue
7. **Miscellaneous Business**

Next Meeting Date: 9:00 a.m., Thursday, January 3, 2019 in the Conference Room
8. **Executive Session in accordance with S.C. Code Section 30-4-70(a)(2) – if needed**
Upon return to open session, Council may take action on matters discussed in Executive Session.
9. **Adjournment**

PUBLIC WORKS COMMITTEE

Thursday, October 4, 2018

The regular meeting of the Public Works Committee was held at 9:00 a.m., Thursday, October 4, 2018 in Council Chambers of City Hall, 1207 Palm Boulevard, Isle of Palms, South Carolina. Attending the meeting were Councilmembers Buckhannon and Kinghorn, Chair Rice, Interim Administrator Fragoso, Public Works Director Pitts and Clerk Copeland; a quorum was present to conduct business.

1. Chair Rice called the meeting to order and acknowledged that the press and public were duly notified of the meeting in accordance with the Freedom of Information Act.

2. Approval of Previous Meeting's Minutes

MOTION: Councilmember Kinghorn moved to approve the minutes of the regular meeting of September 6, 2018 as submitted; Councilmember Buckhannon seconded and the motion PASSED UNANIMOUSLY.

3. Citizens' Comments

4. Departmental Reports for September 2018 – Director Pitts

Director Pitts noted that garbage collections were on a par with the same month in 2017, but debris collections were down substantially. Approximately twenty-eight tons (28 T.) on miscellaneous garbage was taken to the landfill. Prior to Hurricane Florence, Public Works personnel removed the garbage and recycle bins from the beach and afterward replaced them. Weekly beach sweeps took place in September as was cleaning of the parking lot and compactor. In preparation of Hurricane Florence, Public Works personnel staged five (5) pumps; one (1) pump was placed on Palm Boulevard and four (4) pumps were deployed on the public avenues between 46th Avenue and 52nd Avenue.

Tires were the big ticket items on vehicle maintenance in September along with the brake systems repairs to the 1998 Mack truck.

5. Old Business

A. Update on Phase II Drainage project

Interim Administrator Fragoso reported that the drainage installation has been completed on 45th and 46th Avenues; currently crews are making repairs to driveways and the pavement. Pipes have been installed on Palm Boulevard from 46th Avenue to the front of the Citadel Beach House. In approximately two (2) weeks, the contractor plans to be nearing 49th Avenue; at this time the second crew is scheduled to come in to start working down 49th Avenue while the original current crew will continue down Palm toward 52nd Avenue.

B. Update on removal/replacement of underground storage tanks at Public Works site

The contractor will pour the concrete pad at the Public Works site tomorrow; it will set-up over the weekend. Then the canopy company will return to complete the canopy and its components

installation. Once the canopy is finished next week, the water will be pumped out of the tanks, the final test will be performed, and a fuel drop will be done. They expect to have the project completed in the week of October 15th – 19th.

C. Update on drainage issues

Chair Rice felt that a campaign needed to be developed to educate residents of the island to the value of open ditches; as a barrier island, open ditches move storm water off the island much faster than closed ditches.

Interim Administrator Fragoso said that staff would put some ideas together for the Committee's consideration.

When asked where this area was in Eadie's ditch maintenance schedule, Director Pitts said that the ditches have been maintained except for the box, and it has not been cleaned because of the logistical problems in gaining access to it. The Director confirmed that Eadie's is aware of the box because they initially reported the issue to him.

When Councilmember Kinghorn asked how many homes were affected by this situation, Director Pitts said that he was only aware of 267 Forest Trail, but, in his field trip the day before, he saw that several more homes are impacted. He noted that the two (2) homes under construction were required to have an engineered storm water plan, but he did not know what they entailed, but he expected more problems. He stated that these two (2) new homes "will mean more water in an area that cannot take any more water." Currently this area cannot be tied in to an existing outfall; he opined that an engineer needed to determine where an outfall for this area should be located.

E. Update on trashcans with lids on the beach

The Interim Administrator informed the Committee that she has contacted the manufacturer of the cans the Committee saw at the September meeting to request a few to test over the winter months, but she has not received a return call.

F. Update on ditches

- **At 21st – 22nd Avenues** – Director Pitts had nothing to report.
- **At 31st – 32nd Avenues** – Director Pitts had nothing to report.
- **Between 30th and 31st on Hartnett**

Director Pitts reported that the County has assessed the two (2) lots where, over time, the ditches have been filled in or built up, but they have not yet gotten back with the Director on further action.

G. Update on water fountains at Front Beach

Interim Administrator Fragoso had no update for this meeting and stated that, with all that is going on in the City, she suggested that this would be a good first of the year project.

6. New Business

A. Consideration of requirement for removal of portable restrooms from the island in the event of a mandatory evacuation

Chair Rice commented that she saw many portable restrooms on the island as residents prepared for Hurricane Florence; if the City were to get a storm surge, they would become public health hazards. She was looking for a trigger at which time contractors would have to remove them from the island when the City was expecting a storm surge.

Director Kerr stated that they face this issue with the dumpsters, the trailers, the cranes, etc. He stated that the time between the order for a mandatory evacuation and work stopping because people are making their own storm preparations might be two (2) days; in those two (2) days, contractors must tidy up their construction sites. The focus of the Building Inspector has been the trailers and the dumpsters; what he usually finds is that the dumpster is overflowing and in need of servicing. By the time the contractor places his call for service, the provider has closed or is booked and cannot possibly get to the Isle of Palms for his dumpster. He stated that the City could pass an ordinance, but he did not think it would be enforceable; he did not think the City could reasonably expect all of the portable restrooms to be removed.

Currently, the City canvasses all of the construction sites, makes lists, contacts every contractor and every dumpster provider; they have never considered the port-a-lets a threat. He noted that possibly the Department has “dropped the ball” by not including them; he reported that he has reached out to the portable restroom providers who told him that they confirmed that they would not be able to do it.

The Director learned that the portable restrooms are serviced every Wednesday, and they could reasonably adjust that day. He also was told that the providers could dry them out on the day and zip-tie them closed, and they could put a note on the door saying “Do not use; it has been prepared for the storm.” In order to protect their equipment, they are asking that the portable restrooms be taken inside or otherwise secured.

In a first effort, in the initial notice to the contractors, the City staff should add portable restrooms to the list of things to be secured at the work site; they could be put inside the dumpsters.

B. Discussion of Hurricane Florence response

The Chair added this item to the Agenda in case one (1) of the other Committee members saw or was told of a possible threat to the residents or the island that has not been addressed.

Director Pitts stated that Public Works personnel do what they can during the storm preparation, but their real work is post-storm; they act proactively when they deploy the pumps, and they secure the barrels on the beach.

Interim Administrator Fragoso thought the greatest challenge was the fuel situation since it was not available at the Public Works site. The lack of fuel availability was a known factor prior to the beginning of the hurricane season, and staff had a plan in place. She expressed the City's appreciation for the marina manager who remained open and arranged for City vehicles to refuel there. The storage tank replacement should be complete in a couple of weeks, and staff is hopeful that the City does not experience a storm event in the interim.

Another topic of discussion in the after-action meeting was the sandbag operation – were they being placed properly and whether or not they do any good? Based on the peace of mind they give to residents, staff recommended that the City should continue to offer the sandbag service.

In addition, staff also advocated for some type of education for residents on how to properly place them; staff has a couple of ideas that they want to test.

Despite being under-staffed, the Interim Administrator complimented the staff on how well they worked together and the level of professionalism they showed.

Chair Rice commented that the communication to the residents was good.

Councilmember Kinghorn commented on the City's duty to maintain a healthy business at the marina and to be mindful that the second source for fuel on the island was a critical factor. The convenience store across from City Hall sold the last of its gas on Tuesday and closed, but the marina manager had planned ahead and had plenty of fuel.

C. Expansion of plastics ban

The Chair noted that Sullivan's Island and Mount Pleasant were in the process of banning plastic straws and Styrofoam, and she wanted to know if the members of the Committee had any interest in expanding the City's ban on single-use plastic bags to include these items.

According to the Interim Administrator, Sullivan's Island's proposed ordinance would ban the use and distribution of single-use plastic bags, Styrofoam, plastic straws and cups; the City's ordinance only address the distribution of single-use plastic bags. She noted that, if Sullivan's Island's ordinance passes in its current form, people would not be allowed to bring their own plastic bags, cups or straws to the beach.

Chair Rice clarified that, at this time, she was only interested in Styrofoam and plastic straws.

Responding to the Chair's inquiry about interest by other Committee members, Councilmember Buckhannon said that he would prefer to begin with an educational campaign.

The Chair suggested that, at every City event, it should have a tent where residents could be educated about various issues on the island, i.e. drainage, open ditches, hazards to the island's wildlife, coyote management, etc.

Interim Administrator Fragoso remarked that the City had tried that approach for the Farmers' Market, but it was unsuccessful in getting an employee to commit to man the booth. For the Front Beach Festival held in March, the plan is to have a booth related to emergency preparedness.

The Chair questioned why a booth could not be planned for the Tree Lighting coming up on December 1.

The Interim Administrator stated that the single-use plastic bags ordinance could be amended to include these other items that would be bio-degradable or compostable.

Director Pitts cautioned about the use of the term "bio-degradable;" things are only bio-degradable when that product is placed in a compostable situation. For an example, he noted that the new pooper-scooper bags are advertised to be bio-degradable, but, when that bag is placed in a garbage can, not a compostable situation, it is considered to be plastic.

7. Miscellaneous Business

Councilmember Kinghorn thought that the time had come for a report on the Memorandum of Understanding between the City and the IOP Water and Sewer Commission since this Committee will be asked to assume jurisdiction of it.

Councilmember Buckhannon stated that at the next meeting, he would like to have an update on Phase III Drainage, the outfall project.

Next Meeting Date: 8:45 a.m., Thursday, November 1, 2018 in the Conference Room

8. Executive Session – not needed

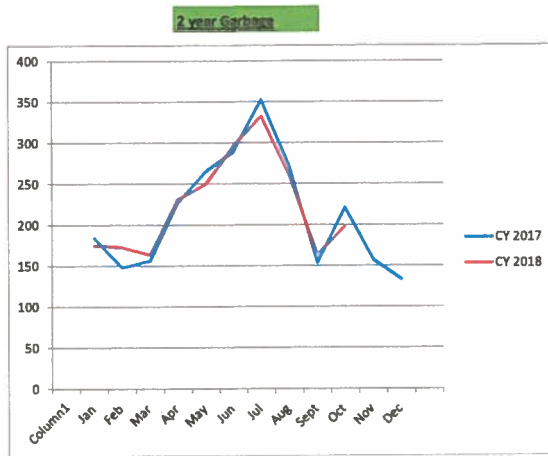
9. Adjournment

MOTION: Councilmember Kinghorn moved to adjourn the meeting at 9:55 a.m.; Councilmember Buckhannon seconded and the motion PASSED UNANIMOUSLY.

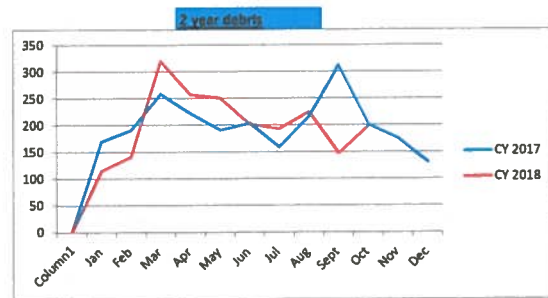
Respectfully submitted:

Marie Copeland
City Clerk

	CY 2017	CY 2018
Column1		
Jan	189.6	174.69
Feb	148.01	172.71
Mar	156.22	163.25
Apr	227.23	230.87
May	265.04	249.85
Jun	289.5	296.1
Jul	352.94	332.64
Aug	271.61	261.2
Sept	153.44	163.41
Oct	220.48	198
Nov	157.03	
Dec	132.96	



	CY 2017	CY 2018
Column1	Column7	Column8
Jan	169.15	114.3
Feb	190.72	140.72
Mar	258.13	320.2
Apr	221.28	256.24
May	190.56	249.91
Jun	203.06	201.29
Jul	158.62	193.36
Aug	216.39	224.47
Sept	311.54	146.88
Oct	200.82	199.28
Nov	174.33	
Dec	131.17	



Action Items

Completed the re-structuring and installation of the new Access Mats at 42nd Ave. and the 31A beach paths.

General duties

Sanitation:

35.52 tons of C&D were transported to the Bees Ferry landfill in October.

Landscaping/Road Maintenance:

Cleaned the beach of debris on Oct. 8th, Oct. 15th and October 29th

Mowed the Breach Inlet right of way and beach path.

Mowed the beach paths from 21st Ave. to 53rd Ave.

Cleaned Palm Blvd of palm fronds littered on the rights of way from 21st to 41st Ave.

Trimmed the limb overhang from the bicycle path on Palm Blvd.

Storm Water:

Eadies Drain and Vac performed regular contracted open ditch maintenance on 2nd Ave. and Carolina and multiple ditches From 22nd Ave. thru Forest Trails including the 41st Ave. ditch

Met with Charleston County Public Works concerning the 32nd Ave. (Burke Ditch) on the solution and timeline for the completion of work.

VEHICLE MAINTENANCE

Beginning Budget \$85,000.00

Balance 10/1/2018 76,976.52

Fund 10 GENERAL FUND

10/01/2018 10-4620.5017 VEHICLE MAINTENANCE

BEG. BALANCE 8,195.98

10/01/2018 AP INV BOLTS FOR PW-9 - CAT 4973444038

5.43 8,201.41

10/03/2018 AP INV PW-26 2014 MACK - PM SERVICE, TAILGATE, AW21320

3,738.96 11,940.37

10/16/2018 AP INV SERVICE CALL - LABOR & MATERIAL ON TINK 116864

1,825.00 13,765.37

10/31/2018 10-4620.5017

END BALANCE 5,569.39 13,765.37

Balance 10/30/2018 \$71,234.63

City of Isle of Palms

CHAPTER 4. - SINGLE-USE PLASTIC BAGS

Sec. 3-4-1. - Purpose.

This chapter is adopted to improve the environment of the City of Isle of Palms by encouraging the use of reusable checkout bags and banning the use of single-use plastic bags for retail checkout of purchased goods. Business establishments are encouraged to make reusable bags available for sale.

(Ord. No. 2015-08, § 1, 6-23-2015)

Sec. 3-4-2. - Definitions.

The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

- (1) *Business establishment* means any commercial enterprise that provides carryout bags to its customers through its employees or independent contractors associated with the business. The term includes sole proprietorships, joint ventures, partnerships, corporations, or any other legal entity whether for profit or not for profit.
- (2) *Carryout bag* means a bag provided by a business establishment to a customer typically at the point of sale for the purpose of transporting purchases.
- (3) *Reusable carryout bag* means a carryout bag that is specifically designed and manufactured for multiple reuse, and meets the following criteria:
 - a. Displays in a highly visible manner on the bag exterior, language describing the bag's ability to be reused and recycled;
 - b. Has a handle, except that handles are not required for carryout bags constructed out of recyclable paper with a height of less than fourteen (14) inches and width of less than eight (8) inches; and
 - c. Is constructed out of any of the following materials:
 - (i) Cloth, other washable fabric, or other durable materials whether woven or non-woven;
 - (ii) Recyclable plastic, with a minimum thickness of 2.25 mils; or
 - (iii) Recyclable paper.
- (4) *Single-use carryout bag* means a carryout bag that is not a reusable carryout bag.
- (5) *Customer* means a person who purchases merchandise from a business establishment.

(Ord. No. 2015-08, § 1, 6-23-2015)

Sec. 3-4-3. - Regulations.

- (1) No person may provide single-use carryout bags at any city facility, city-sponsored event, or any event held on city property.
- (2) No business establishment within the city limits may provide single-use carryout bags to its customers.
- (3) Business establishments within the city limits are strongly encouraged to provide prominently displayed signage advising customers of the benefit of reducing, reusing and recycling and promoting the use of reusable carryout bags by customers.

- (4) A business establishment within the city limits may provide or sell reusable carryout bags to its customers or any person. Subject to hours of operation and applicable regulations regarding the use of public property, including those pertaining to solicitation and commercial activities on public property, a person may provide or sell reusable carryout bags at any city facility, city-sponsored event, or any event held on city property.

(Ord. No. 2015-08, § 1, 6-23-2015)

Sec. 3-4-4. - Exemptions.

This chapter shall not apply to:

- (1) Laundry dry cleaning bags, door-hanger bags, newspaper bags, or packages of multiple bags intended for use as garbage, pet waste, or yard waste;
- (2) Bags provided by pharmacists or veterinarians to contain prescription drugs or other medical necessities;
- (3) Bags used by restaurants to take away prepared food;
- (4) Bags used by a customer inside a business establishment to:
 - a. Contain bulk items, such as produce, nuts, grains, candy, or small hardware items;
 - b. Contain or wrap frozen foods, meat, or fish, whether or not prepackaged;
 - c. Contain or wrap flowers, potted plants or other items to prevent moisture damage to other purchases; or
 - d. Contain unwrapped prepared foods or bakery goods;
- (5) Bags used by a non-profit corporation or other hunger relief charity to distribute food, grocery products, clothing, or other household items; and
- (6) Bags of any type that the customer brings to the store for their own use for carrying away from the store goods that are not placed in a bag provided by the store.

(Ord. No. 2015-08, § 1, 6-23-2015)

Sec. 3-4-5. - Enforcement and penalties.

- (1) The police department has primary responsibility for enforcement of this chapter. The designated livability officer is authorized to promulgate regulations and to take any and all other actions reasonable and necessary to enforce this chapter, including, but not limited to, investigating violations, issuing fines and entering the premises of any business establishment during business hours.
- (2) If the livability officer determines that a violation of this chapter has occurred, he/she will issue a written warning notice to the owner or operator of the business establishment that a violation has occurred and the potential penalties that will apply for future violations.
- (3) Any business establishment that violates or fails to comply with any of the provisions of this chapter after a written warning notice has been issued for that violation shall be deemed guilty of a misdemeanor and shall for each violation, upon conviction thereof, be punished as provided in section 1-3-66. The penalty shall not exceed one hundred (\$100.00) dollars for a first violation; two hundred (\$200.00) dollars for a second violation within any twelve-month period; and five hundred (\$500.00) dollars for each additional violation within any twelve-month period. Each day that a violation continues will constitute a separate offense.

- (4) In addition to the penalties set forth in this section, repeated violations of this chapter by a person who owns, manages, operates, is a business agent of, or otherwise controls a business establishment may result in the suspension or revocation of the business license issued to the premises on which the violations occurred. No city business license shall be issued or renewed until all fines outstanding against the applicant for violations of this chapter are paid in full.
- (5) Violation of this chapter is hereby declared to be a public nuisance, which may be abated by the city by restraining order, preliminary and permanent injunction, or other means provided for by law, and the city may take action to recover the costs of the nuisance abatement.

(Ord. No. 2015-08, § 1, 6-23-2015)

Sec. 3-4-6. - Effective date and waivers.

All of the requirements set forth in this chapter shall take effect January 1, 2016. In the event that compliance with the effective date of this chapter is not feasible for a business establishment because of either unavailability of alternative checkout bags or economic hardship, city council may grant a waiver of not more than twelve (12) months upon application of the business owner or owner's representative.

(Ord. No. 2015-08, § 1, 6-23-2015)

CHAPTER 53: ENVIRONMENTALLY ACCEPTABLE PACKAGING AND PRODUCTS

Section

[53.01](#) Definitions

[53.02](#) Single-use plastic carryout bags

[53.03](#) Polystyrene/plastic foam disposable food service ware

[53.04](#) Disposable food service ware

[53.05](#) Prohibited sales

[53.06](#) Exemptions for recyclable or properly composted food service ware and other polystyrene/plastic foam products

[53.07](#) Requests for exemption

[53.99](#) Enforcement and penalties

§ 53.01 DEFINITIONS.

Unless otherwise expressly stated, whenever used in this chapter the following terms shall have the meanings set forth below:

AFFORDABLE. Means that a compostable or recyclable product may cost up to 15% more than the purchase cost of the non-compostable or nonrecyclable alternative(s) and not be regarded, on balance, as exorbitant, overpriced, unreasonable or invaluable.

ASTM STANDARD. Meeting the standards of the American Society for Testing and Materials (ASTM) International Standards D6400 or D6868 for compostable plastics, as those standards may be amended.

BUSINESS ESTABLISHMENT. Any commercial enterprise that provides carryout bags to its customers through its employees or independent contractors associated with the business. The term includes sole proprietorships, joint ventures, partnerships, corporations, or any other legal entity whether for profit or not for profit. This term is inclusive of any store or business which sells or offers goods or merchandise, located or operating within the town, including those referenced in **FOOD OR GROCERY ESTABLISHMENT** and **FOOD PROVIDER**.

COMPOSTABLE. All the materials in the product or package, when composted in an industrial or municipal compost operation, will break down, or otherwise become part of, usable compost (e.g. soil-conditioning material, mulch) in a safe and timely manner. Compostable food service ware must meet ASTM-Standards for compostability and any bio-plastic or plastic-like product must be clearly labeled, preferably with a colorsymbol, to allow proper identification such that the collector and processor can easily distinguish the ASTM standard compostable plastic from non-ASTM standard compostable plastic. Compostable products are considered

compostable under this section only if a business establishment or food or grocery establishment using the products is composting them with an industrial or municipal compost operation.

DISPOSABLE FOOD SERVICE WARE. Interchangeable with **TO GO** packaging and **FOOD PACKAGING MATERIAL** and includes, but is not limited to: all containers, clamshells, bowls, plates, trays, cartons, cups, straws, stirrers, napkins and other items designed for one-time use associated with prepared foods, including without limitation, service ware for takeout foods and/or leftovers from partially consumed meals prepared by food providers.

EVENTS PROMOTER. An applicant for any event permit issued by the town or any town employee(s) responsible for any town-organized event.

FOOD OR GROCERY ESTABLISHMENT. All sales outlets, stores, shops, vehicles or other places of business located within the town which operate to sell or convey foods, or beverages, which foods or beverages are predominantly contained, wrapped or held in or on packaging. **FOOD ESTABLISHMENT** shall include, but not be limited to, any place where food is prepared, mixed, cooked, baked, smoked, preserved, bottled, packaged, handled, stored, manufactured and sold or offered for sale, including, but not limited to, any fixed or mobile restaurant, drive-in, convenience store, coffee shop, cafeteria, short-order cafe, delicatessen, luncheonette, grill, sandwich shop, soda fountain, hotel, motel, movie house, theatre, bed and breakfast inn, tavern, bar, cocktail lounge, nightclub, roadside stand, takeout prepared food place, industrial feeding establishment, catering kitchen, mobile food preparation unit, commissary, event, grocery store, public food market, produce stand, food stand, or similar place in or at which food or drink is prepared for sale, or for service, on the premises or elsewhere, and any other establishment or operation where food is processed, prepared, stored, served, sold, or provided for the public and any organization, group or individual which provides food as part of its service.

FOOD PROVIDER. Any vendor, business, organization, entity, group, or individual, including food establishments, as defined herein, located in the town that offers food or beverage to the public.

PERSON. An individual, business, event promoter, trust, firm, joint stock company, corporation, non-profit, including a government corporation, partnership, or association.

POLYSTERENE/PLASTIC FOAM. Blown expanded and extruded polystyrene (sometimes called Styrofoam™) or other plastic foams which are processed by any number of techniques including, but not limited to, fusion of monomer spheres (expanded bead plastic), injection molding, foam molding, and extrusion-blown molding (extruded foam plastic). Polystyrene and other plastic foam is generally used to make cups, bowls, plates, trays, clamshell containers, meat trays, egg cartons, coolers, ice chests, shipping boxes, packing peanuts, and beach or pool toys. The term **POLYSTYRENE** also includes clear or solid polystyrene which is known as **ORIENTED POLYSTYRENE**.

POLYSTYRENE/PLASTIC FOAM PRODUCTS. Any item such as coolers, ice chests, cups, bowls, plates, clamshells, shipping boxes, containers, cutlery, or any other merchandise containing polystyrene/plastic foam that is not wholly encapsulated or encased by a more durable material.

PREPARED FOOD. Food or beverages, which are served, packaged, cooked, chopped, sliced, mixed, brewed, frozen, squeezed or otherwise prepared within the town. **PREPARED FOOD** does not include raw, butchered meats, fish and/or poultry sold from a butcher case or similar food establishment.

RECYCLABLE. Any material that is accepted by the town recycling program or the Charleston County recycling program, including, but not limited to, paper, glass, aluminum, cardboard and plastic bottles, jars and tubs. This also means any approved alternative products which are accepted by the county recycling centers.

REUSABLE CARRYOUT BAG. A carryout bag that is specifically designed and manufactured for multiple reuse, and meets the following criteria:

- (1) Displays in a highly visible manner on the bag exterior language describing the bag's ability to be reused and recycled;
- (2) Has a handle;
- (3) Is constructed out of any of the following materials:
 - (a) Cloth, other washable fabric, or other durable materials whether woven or non-woven;
 - (b) Recyclable plastic, with a minimum thickness of 2.25 mils; and
 - (c) Has a minimum lifetime of 125 uses, which for purposes of this section means the capability of carrying a minimum of 22 pounds 125 times over a distance of at least 175 feet.

SINGLE-USE PLASTIC CARRYOUT BAG. A bag provided by a business establishment to a customer typically at the point of sale for the purpose of transporting purchases, which is made predominantly of plastic derived from either petroleum or a biologically-based source.

TOWN OF MOUNT PLEASANT CONTRACTOR. Any person or entity that has a contract with the town for work or improvement to be performed, for a franchise, concession, for grant monies, goods and services, or supplies to be purchased at the expense of the town, or to be paid out of monies deposited in the treasury or out of trust monies under the control or collected by the town.

TOWN OF MOUNT PLEASANT FACILITY. Any building, structure or vehicle owned and operated by the town, its agents, agencies, and departments.

(Ord. 18024, passed 4-16-18)

§ 53.02 SINGLE-USE PLASTIC CARRYOUT BAGS.

(A) No business establishment or food or grocery establishment may provide single-use plastic carryout bags at any town facility, town-sponsored event, or any event held on town property.

(B) No business establishment or food or grocery establishment within the town limits may provide single use plastic bags to its customers.

(Ord. 18024, passed 4-16-18)

§ 53.03 POLYSTYRENE/PLASTIC FOAM DISPOSABLE FOOD SERVICE WARE.

(A) Food providers within the town may not provide food in any disposable food service ware that contains polystyrene/plastic foam.

(B) Disposable food service ware that contains polystyrene/plastic foam is prohibited from use in all town facilities.

(C) Town contractors in the performance of town contracts and events promoters may not provide food in disposable food service ware that contains polystyrene/plastic foam.

(Ord. 18024, passed 4-16-18)

§ 53.04 DISPOSABLE FOOD SERVICE WARE.

(A) All food or grocery establishments and food providers within the town utilizing disposable food service ware shall use recyclable or compostable products, subject to the provisions of §§ 53.06 and 53.07.

(B) All food providers may give straws, lids, cutlery, and to-go condiment packages upon request of the customer.

(C) All town facilities utilizing disposable food service ware shall use products that are recyclable or compostable.

(D) Town contractors and events promoters utilizing disposable food service ware shall use recyclable or compostable products while performing under a town contract or permit.

(Ord. 18024, passed 4-16-18)

§ 53.05 PROHIBITED SALES.

No business establishment or event promoter within the town may sell, rent, or otherwise provide any polystyrene/plastic foam product which is not wholly encapsulated or encased within a more durable material, except as exempted in this chapter. This specifically includes, but is not limited to, cups, plates, bowls, clamshells, bags, and other products intended primarily for food service use, as well as coolers, containers, ice chests, shipping boxes, or packing peanuts.

(Ord. 18024, passed 4-16-18)

§ 53.06 EXEMPTIONS FOR RECYCLABLE OR PROPERLY COMPOSTED FOOD SERVICE WARE AND OTHER POLYSTYRENE/PLASTIC FOAM PRODUCTS.

(A) Products made from polystyrene/plastic foam which is wholly encapsulated or encased by a more durable material are exempt from the provisions of this chapter. Examples include surfboards, boats, life preservers, and craft supplies which are wholly encapsulated or encased by a more durable material, and durable coolers not principally composed of polystyrene/plastic foam;

(B) Construction products made from polystyrene/plastic foam are exempted from this chapter if the products are used in compliance with town code and used in a manner preventing the polystyrene/plastic foam from being released into the environment;

(C) *Emergency, hospital, and medical supply and services procurement.* In an emergency situation and for the immediate preservation of the public peace, health or safety, town facilities, food vendors, town franchises, contractors and vendors doing business with the town shall be exempt from the provisions of this chapter;

(D) Laundry dry cleaning bags, door-hanger bags, newspaper bags, or packages of multiple bags intended for use as garbage, pet waste, or yard waste; although the town encourages the use of recyclable or compostable products throughout;

(E) Bags provided by physicians, dentists, pharmacists or veterinarians to contain prescription drugs or other medical necessities;

(F) Bags used by a customer inside a business establishment to:

(1) Contain bulk items, such as produce, nuts, grains, candy, or small hardware items;

(2) Contain or wrap frozen foods, meat, or fish, whether or not prepackaged;

(3) Contain or wrap flowers, potted plants or other items to prevent moisture damage to other purchases; or

(4) Contain unwrapped prepared foods or bakery goods;

(G) Bags used by a non-profit corporation or other hunger relief charity to distribute food, grocery products, clothing, or other household items;

(H) Bags of any type that the customer brings to the store for their own use for carrying away from the store goods that are not placed in a bag provided by the store;

(I) Meat trays, plastic drink lids and cutlery (i.e.: forks, spoons, knives) are exempt from the provisions of this chapter; and

(J) Any product purchased, prepared or packaged outside the town and sold in or delivered into the town are exempt from the provisions of this chapter.

(Ord. 18024, passed 4-16-18)

§ 53.07 REQUESTS FOR EXEMPTION.

(A) The Public Services Committee may exempt a food or grocery establishment or food provider from the requirements set forth in this chapter for up to a one-year period upon the food provider showing, in writing, that this chapter would create an undue hardship or practical difficulty not generally applicable to other persons in similar circumstances. The Public Services Committee shall put the decision to grant or deny up to a one-year exemption in writing, however the decision may be appealed to Town Council.

(B) Exemptions to allow for the sale or provision of polystyrene/plastic foam products may be granted by the Public Services Committee if the food or grocery establishment or food provider can demonstrate in writing a public health and safety requirement or medical necessity to use the product. The Public Services Committee shall put the decision to grant or deny the exemption in writing and the decision may be appealed to Town Council.

(C) An exemption application shall include all information necessary for the Public Services Committee to make a decision, including but not limited to documentation showing factual support for the claimed exemption. The Public Services Committee may require the applicant to provide additional information.

(D) The Public Services Committee may approve the exemption application in whole or in part, with or without conditions.

(Ord. 18024, passed 4-16-18)

§ 53.99 ENFORCEMENT AND PENALTIES.

(A) The Police Department has primary responsibility for enforcement of this chapter. The Police Department is authorized to take any and all other actions reasonable and necessary to enforce this chapter, including, but not limited to, investigating violations, issuing fines and entering the premises of any business establishment during business hours.

(B) If a police officer determines that a violation of this chapter has occurred, he/she will issue a written warning notice to the owner or operator of the business establishment that a violation has occurred and the potential penalties that will apply for future violations.

(C) Any business establishment that violates or fails to comply with any of the provisions of this chapter after a written warning notice has been issued for that violation shall be subject to a civil penalty that shall not exceed \$200 for a first violation; \$350 for a second violation within any 12-month period; and \$500 for each additional violation within any 12-month period. Every 30 days that a violation continues will constitute a separate offense.

(D) In addition to the penalties set forth in this section, repeated violations of this chapter by a person who owns, manages, operates, is a business agent of, or otherwise controls a business establishment may result in the suspension or revocation of the business license issued to the premises on which the violations occurred. No town business license shall be issued or renewed until all fines outstanding against the applicant for violations of this chapter are paid in full.

(E) Violation of this chapter is hereby declared to be a public nuisance, which may be abated by the town by restraining order, preliminary and permanent injunction, or other means provided for by law, and the town may take action to recover the costs of the nuisance abatement.

(Ord. 18024, passed 4-16-18)

ORDINANCE 2018-06

AN ORDINANCE PROHIBITING THE USE AND DISTRIBUTION OF SINGLE-USE PLASTIC BAGS, PLASTIC STRAWS, POLYSTYRENE COOLERS, POLYSTYRENE FOOD CONTAINERS OR POLYSTYRENE CUPS BY ANY BUSINESS ESTABLISHMENT IN THE TOWN OF SULLIVAN’S ISLAND, ANY PROPERTY OF THE TOWN OF SULLIVAN’S ISLAND OR IN THE RC-1 ZONING DISTRICT OF THE TOWN OF SULLIVAN’S ISLAND

WHEREAS, the Town of Sullivan’s Island has the authority to enact ordinances which promote the public health, safety and general welfare of its residents; and,

WHEREAS, THE Town enjoys a pristine beach environment which is enjoyed by residents and has become a destination popular destination; and,

WHEREAS, the Town has an obligation to protect the unique coastal resources and environmentally sensitive habitat areas and reduce the amount of plastic and polystyrene waste generated in the community; and,

WHEREAS, the Town continues to confront littered plastic in its public areas;

NOW, THEREFORE, BE IT ORDAINED by the Town of Sullivan’s Island, in meeting assembled that Section 14-36 be codified as follows:

Sec. 14-36 Use and distribution of single-use plastic bags, plastic straws, polystyrene coolers, polystyrene food containers or cups.

This section is adopted to improve the environment of the Town of Sullivan’s Island by requiring the use of reusable checkout bags and recyclable paper carryout bags and food containers, banning the use of single-use plastic bags for retail checkout of purchased goods, use of polystyrene food containers, polystyrene cups and plastic straws. Further, to improve and maintain the pristine beach and ocean environment of the Town of Sullivan’s Island, single-use plastic bags, plastic straws, polystyrene coolers and polystyrene food containers and cups will be prohibited in in the CD and RC-1 Zoning Districts.

A. Definitions

Unless otherwise expressly stated, whenever used in this section the following terms shall have the meanings set forth below:

- (1) *Business Establishment*. Any commercial enterprise that provides carryout bags to its customers through its employees or independent contractors associated with the business. The term includes sole proprietorships, joint ventures, partnerships, corporations, or any other legal entity whether for profit or not for profit. This term is inclusive of any store or business which sells or offers goods or merchandise, located or operating within the town, including those referenced as a food establishment or food provider.

- (2) *Carryout Bag*. A bag provided by a business establishment to a customer typically at the point of sale for the purpose of transporting purchases.
- (3) *Customer*. A person who purchases merchandise from a business establishment.
- (4) *Disposable Food Service Ware*. Interchangeable with *To Go* packaging and *Food Packaging Material*. Includes but is not limited to: all containers, clamshells, bowls, plates, trays, cartons, cups, straws, stirrers, napkins and other items designed for one-time use associated with prepared foods, including without limitation, service ware for takeout foods and/or leftovers from partially consumed meals prepared by food providers.
- (5) *Polystyrene/Plastic Foam*. Blown expanded and extruded polystyrene (sometimes called Styrofoam) or other plastic foams which are processed by any number of techniques including, but not limited to, fusion of monomer spheres (expanded bead plastic), injection molding, foam molding, and extrusion-blown molding (extruded foam plastic). Polystyrene and other plastic foam is generally used to make cups, bowls, plates, trays, clamshell containers, meat trays, egg cartons, coolers, ice chests, shipping boxes, packing peanuts, and beach or pool toys. The term *polystyrene* also includes clear or solid polystyrene which is known as *oriented polystyrene*.
- (6) *Reusable Carryout Bag*. A carryout bag that is specifically designed and manufactured for multiple reuse, and meets the following criteria:
- Displays in a highly visible manner on the bag exterior, language describing the bag's ability to be reused and recycled;
 - Has a handle, except that handles are not required for carryout bags constructed out of recyclable paper with a height of less than fourteen (14) inches and width of less than eight (8) inches; and,
 - Is constructed out of any of the following materials:
 - Cloth, other washable fabric, or other durable materials whether woven or non-woven;
 - Recyclable plastic, with a minimum thickness of 2.25 mils; or
 - Recyclable paper.
- (7) *Single-Use Plastic Carryout Bag*. A bag provided by a business establishment to a customer typically at the point of sale for the purpose of transporting purchases, which is made predominantly of plastic derived from either petroleum or a biologically-based source. "Single-use plastic carryout bag" includes compostable and biodegradable bags but does not include reusable carryout bags.

- (8) *Town of Sullivan's Island Facility (hereafter "Town")*. Any building, structure, vehicle or property owned and operated or leased by the Town, its agents, agencies, departments or lessee.

B. Regulations

- (1) No business establishment may provide single-use plastic carryout bags or polystyrene products at any Town facility, town-sponsored event, or any event held on Town property or on any Town property.
- (2) No business establishment within the Town may provide single-use carryout bags to its customers.
- (3) Food providers within the Town shall not provide food in any disposable food service ware that contains polystyrene/plastic foam. All food establishments within the Town shall use recyclable or compostable products.
- (4) Food providers within the Town shall not use plastic straws.
- (5) A business establishment within the Town limits may provide or sell reusable carryout bags to its customers or any person. Subject to hours of operation and applicable regulations regarding the use of public property, including those pertaining to solicitation and commercial activities on public property, a person may provide or sell reusable carryout bags at any Town facility, Town-sponsored event, or any event held on Town property.
- (6) All single-use carry out plastic bags, plastic straws and polystyrene/plastic foam products such as but not limited to cups, bowls, plates, trays, clamshell containers, meat trays, egg cartons, coolers, ice chests, are expressly prohibited from use on in the RC-1 Zoning District commonly known as the beach or on any other Town owned properties.

C. Exceptions.

- (1) Products made from polystyrene/plastic foam which is wholly encapsulated or encased by a more durable material are exempt from the provisions of this section. Examples include surfboards, boats, life preservers, and craft supplies which are wholly encapsulated or encased by a more durable material, and durable coolers not principally composed of polystyrene/plastic foam.

- (2) Construction products made from polystyrene/plastic foam are exempted from this chapter if the products are used in compliance with Town code and used in a manner preventing polystyrene/plastic foam from being released into the environment.
- (3) In an emergency situation and for the immediate preservation of the public peace, health or safety, town facilities business establishments, food vendors, contractors and other vendors doing business with and in the Town shall be exempt from the provisions of this chapter.
- (4) Laundry dry cleaning bags, door-hanger bags, newspaper bags, or packages of multiple bags intended for use as garbage, pet waste, or yard waste, although the Town encourages the use of recyclable or compostable products throughout.
- (5) Bags provided by physicians, dentists, pharmacists or veterinarians to contain prescription drugs or other medical necessities.
- (6) Bags used by a customer inside a business establishment to:
 - a. Contain or wrap frozen foods, meat, or fish, whether or not prepackaged.
 - b. Contain or wrap flowers, potted plants or other items to prevent moisture damage to other purchases.
 - c. Contain unwrapped prepared foods or bakery goods.
- (7) Bags used by a non-profit corporation or other hunger relief charity to distribute food, grocery products, clothing, or other household items.
- (8) Bags of any type that the customer brings to the store for their own use for carrying away from the store goods that are not placed in a bag provided by the store.
- (9) Plastic drink lids and cutlery are exempt from the provisions of this section.
- (10) Plastic straws are permitted for individuals with special needs.

D. Enforcement and penalties.

- (1) The Police Department has primary responsibility for enforcement of this section. The Police Department is authorized to take any and all other actions reasonable and necessary to enforce this section, including, but not limited to, investigating violations, issuing fines and entering the premises of any business establishment during business hours. However, any enforcement officer or official of the Town, including Beach Services Officers, and other Code Enforcement officials may enforce this section.
- (2) Any business establishment that violates or fails to comply with any of the provisions of this section shall be deemed guilty of a misdemeanor and shall for each violation upon

conviction thereof, be subject of a penalty of one hundred (\$100.00) dollars for the first violation; two hundred (\$200.00) for the second violation within any twelve-month period; and five hundred (\$500.00) dollars for each additional violation within any twelve-month period. Each day that a violation continues will constitute a separate offense.

- (3) In addition to the penalties set forth in this section, repeated violations of this section by a person who owns, manages, operates, is a business agent of, or otherwise controls a business establishment may result in the suspension or revocation of the business license issued to the premises on which the violations occurred. No Town business license shall be issued or renewed until all fines outstanding against the applicant for violations of this section are paid in full.
- (4) Violation of this chapter is hereby declared to be a public nuisance, which may be abated by the Town by restraining order, preliminary and permanent injunction, or other means provided for by law, and the Town may act to recover the costs of the nuisance abatement.
- (5) For offenses of this section in the RC-1 Zoning District (beach) a verbal warning may be issued; however, violators are subject to a penalty of one hundred (\$100.00) dollars per offense.

E. Requests for exemption.

- (1) Town Council may exempt a food establishment or food provider from the requirement set forth in this section for up to a one-year period upon the provider showing, in writing, that this section would create an undue hardship or practical difficulty not generally applicable to other business establishments or persons in similar circumstances.
- (2) Exemptions to allow for the provision of single-use carry out bags or disposable food service ware may be granted by Town Council if the business establishment or food provider can demonstrate in writing a public health and safety requirement, medical necessity or that the product will not damage the environment of the Town of Sullivan's Island.
- (3) Town Council may approve the exemption application in whole or in part, with or without conditions.

F. Effective Date.

All requirements set forth in this section shall take effect December 1, 2018. In the event that compliance with the effective date of this section is not feasible for a business establishment because of either unavailability of alternative carryout bags or economic hardship, Town Council may grant a waiver of not more than twelve (12) months upon application of the business owner or owner's representative.

G. Severability and inconsistency.

If any court of competent jurisdiction holds any section, provision, clause, phrase, or application of this Zoning Ordinance invalid or unconstitutional for any reason, the remaining provisions of this ordinance shall be deemed severable there from and shall be construed as reasonable and necessary to achieve the lawful purposes of the ordinance.

ATTEST:

Courtney Lyles, Town Clerk

First Reading: _____

Second Reading: _____

Third Reading: _____



REQUEST FOR PROPOSALS 2018-02
CITY OF ISLE OF PALMS • SC
PHASE 3 DRAINAGE OUTFALL
DESIGN & PERMITTING
SEPTEMBER 5 • 2018 • 2PM





September 5, 2018

Mr. Douglas Kerr
Director of Building and Planning
City of Isle of Palms
1207 Palm Boulevard
Isle of Palms, South Carolina 29451

Re: Request for Proposals 2018-02
Phase 3 Drainage Outfall Design and Permitting

Dear Mr. Kerr:

The City of Isle of Palms has experienced continual flooding problems throughout the Island due to more frequent and intense rainfall events, extremely high “king” tides, sea level rise, a high-water table, and coastal storms, combined with an inadequate stormwater management system. To address ongoing flooding issues, the City is soliciting proposals from engineering consultants to provide services for Phase 3 Drainage Outfall Design and Permitting. Thomas & Hutton has the local, in-house capabilities and staff to perform all services and our team has the expertise, experience, and resources to accomplish this very challenging project within a time frame acceptable to the City.

In considering our proposal, we would like to highlight the following points:

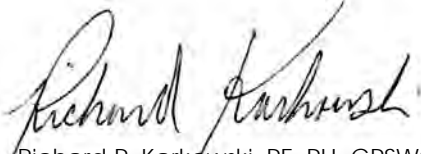
- ✓ **Stormwater Management Expertise** – Whether the issue is poor drainage and flooding, impaired water quality, or developing a complex and long-term stormwater management master plan, Thomas & Hutton has the proven expertise in assessing all types of water resources issues, developing practical solutions, and producing results. We have addressed local drainage issues with municipalities and private land owners, prepared basin-wide, city-wide, and county-wide improvement plans, and have worked on regional and state level water resources management issues. This expertise in all areas of stormwater management (including analysis, modeling, design, permitting, management, etc.) will allow us to develop a design that is **realistic, comprehensive, and implementable**.
- ✓ **Local and Integrated Experience** – Thomas & Hutton has extensive direct experience in studying, analyzing, and designing stormwater management system improvements. Our team has been involved in numerous similar drainage studies and system assessments resulting in recommended projects that have been successfully implemented. We’ve recently provided services to address drainage improvements for clients, including City of Charleston, Town of Mount Pleasant, Town of Sullivan’s Island, Town of Summerville, Horry County, and Charleston County (including work in the following municipalities - Folly Beach, Isle of Palms, Sullivan’s Island, McClellanville, and James Island). We’ve also worked extensively with many clients on identifying and applying for alternative funding grants. These clients include Charleston County (Main Road Drainage Improvements), City of Lake City (Acline Drainage Improvements), Town of Sullivan’s Island (Drainage Improvements), and the Isle of Palms Water and Sewer Commission (Forest Trails WWTP Floodproofing). This past experience with other jurisdictions and with project funding (among other experience) will allow the City of Isle of Palms to confidently **rely on Thomas & Hutton for all services that may be necessary for this project**.
- ✓ **Depth of Resources** – Thomas & Hutton has the local staff and resources to address the project’s needs and schedule. We can successfully address this project in a systematic approach. In addition to the resources identified in this proposal, Thomas & Hutton has over 270 employees competent in the areas of civil, environmental, structural, and marine engineering; land surveying; land planning; landscape architecture; Geographic Information Systems (GIS); and construction administration that can be called upon - if needed. Our resources will be dedicated to the City of Isle of Palms’ needs and to the completion of the project in a **professional, efficient, and timely manner**.

Mr. Douglas Kerr
City of Isle of Palms
September 5, 2018
Page 2

Thomas & Hutton's team of highly qualified and experienced personnel are eager to work on this project. **We are committed to exceeding your expectations of quality and service.** We welcome the opportunity to discuss this important project in greater detail and thank you for your careful consideration of our qualifications and proposal. Tony Woody will be the Principal-in-Charge of this project and is a Vice President of Thomas & Hutton. Tony is authorized to make representations on behalf of Thomas & Hutton and to bind Thomas & Hutton to a contract with the City. We have identified Rick Karkowski as our Project Manager. Should you have any questions or concerns, Rick can be reached at (843)725-5280 or karkowski.r@thomasandhutton.com.

Very Truly Yours,

THOMAS & HUTTON

A handwritten signature in black ink that reads "Richard P. Karkowski". The signature is fluid and cursive, with the first name being the most prominent.

Richard P. Karkowski, PE, PH, CPSWQ, D.WRE
Project Manager

A handwritten signature in black ink that reads "Tony Woody". The signature is stylized and cursive, with the first name being the most prominent.

Tony Woody, PE
Principal-in-Charge/Vice President



EXECUTIVE SUMMARY

INTRODUCTION

Thomas & Hutton understands the purpose of the City of Isle of Palms' Phase 3 Drainage Outfall Design and Permitting project is to study, design, permit, and construct improved outfall systems at three locations including 30th Avenue, Forest Trails, and 41st Avenue. These outfalls are generally to start on the south side of Waterway Boulevard and extend to the Intracoastal Waterway. We understand that the City has design goals to be considered in the development of the project. We further understand that the City is seeking assistance in developing a phasing plan for the implementation of the outfall projects, as well as identifying potential funding sources.

We are very familiar with the three project sites and have an extensive background of working on the Isle of Palms and in the area of the outfalls. We have extensive experience in implementing projects of similar complexity with similar design goals and site constraints. To prepare for this proposal, we visited the outfall sites and contributing basins, assessed data from our in-house GIS library, and prepared individual outfall exhibits and basin delineations.

WORK HISTORY AND REFERENCES

In addition to our extensive drainage improvement project experience, our project team has the necessary skills and background to provide all the associated services that may be needed to successfully implement this project. The Thomas & Hutton team has successfully implemented similarly sized projects for other jurisdictions in the area. Most of the projects have been completed for long-term and repeat clients, including the City of Charleston, the Town of Mount Pleasant, and Charleston County.

PROJECT TEAM

Our project team consists of a tight-knit group of professionals based in our Charleston office, which is less than nine miles from City Hall and the project outfall sites. This team is composed of stormwater management specialists from our Water Resources Department, as well as many others to support this effort. We have dedicated to your project a team that has successfully accomplished similar drainage improvement projects in the local area. Our team will bring that experience to bear on your project.

SUB-CONSULTANTS

We have identified needing assistance from two sub-consultants to complete this project successfully: Terracon and Arcadis. Terracon will provide geotechnical investigation and engineering services, wetland/critical area permitting assistance, and grant funding advising services. Arcadis will assist in providing grant funding advising services. Thomas & Hutton has worked closely with both sub-consultants on similar drainage improvement projects where similar project services were provided by the sub-consultants.

PROJECT APPROACH

Based on the City's Request for Proposals and our significant past experience with similar drainage improvement projects, we have provided a detail project approach to meet your projects needs and accomplish the City's goals. We believe this project approach can be implemented to efficiently and effectively study, design, permit, and construct the three outfall improvements. We also believe that we can help the City identify grant opportunities and successfully develop a phasing plan based on these grants and City's other financial resources. For the comprehensive services that the Thomas & Hutton team has proposed to provide the City, we have developed a project budget that is inclusive of all the anticipated services for the project.

CLOSING

As outlined in our cover letter, we believe the Thomas & Hutton team is the best choice for the City of Isle of Palms for the Phase 3 Drainage Outfall Design and Permitting project for the following simple reasons:

- Stormwater Management Expertise
- Local and Integrated Experience
- Depth of Resources





QUALIFICATIONS

In 1946, former US Army Corps of Engineers Officers, Hue Thomas and Joe Hutton, joined forces and opened an engineering firm in the historic city of Savannah, Georgia. Our founders envisioned tremendous opportunities in providing professional consulting services to municipalities in the region, as well as private entities seeking to develop in the area. Today, **THOMAS & HUTTON** stands as one of the most well respected and established consulting and engineering firms in the region. With 11 offices in the southeast, more than 270 staff, and 72 years of continuous experience, Thomas & Hutton is confident in having the technology and associated technical resources available to provide the necessary services for the City of Isle of Palms Phase 3 Drainage Outfall Design and Permitting Project.

Thomas & Hutton designs infrastructure with the future in mind. Our talented staff are passionate and stand firmly behind designing facilities that ultimately create the essential framework of healthy and thriving communities. To provide quality professional services and project support to our clients, our technical competencies include stormwater, municipal services, civil, transportation, environmental, structural and marine engineering, land planning, landscape architecture, land surveying, Geographic Information Systems (GIS), and construction administration. We are licensed to practice engineering and land surveying in South Carolina (COA 00285). We provide knowledge and expertise in working in, and with, the City of Isle of Palms and have tremendous experience with the various permitting and regulatory requirements. Our clients find that our strong relationships with local, state, and federal agencies are very helpful to expedite project approvals.

FIRM LOCATION

We offer the City of Isle of Palms a strong local presence and provide cost-effective solutions, based on our knowledge and experience on the Isle of Palms and the surrounding areas.

We have a wealth of experience in all aspects of project management, quality assurance, and interdisciplinary technical expertise across all tasks required for this contract. Service to the City will be provided from our Mount Pleasant office, located approximately nine miles from the City offices. We are in close proximity and can be present at the job site within 30 minutes. Nearly all staff proposed for this project are located in our local Mount Pleasant office.

All members identified on the Thomas & Hutton team are available to begin work immediately upon notice to proceed for any of the project tasks. It is important to note our team philosophy that once a team member is assigned to a project, they are dedicated to that particular project until completed. Our team believes this as a core

STORMWATER CONSULTING SERVICES

The Thomas & Hutton team has an extensive history of performing stormwater management services for clients throughout the southeastern United States. Our team provides comprehensive expertise and can provide the City of Isle of Palms a "full service" experience for this project. Through the collaborative experience of our team members, we can provide the City the following services:

MUNICIPAL/COUNTY STORMWATER SERVICES

- Stormwater Capital Improvement Projects
- Stormwater Inventory/GIS Database Preparation
- Regional Stormwater BMP Design
- Canal/Riverine Improvements
- Storm Drainage System Remediation Rehabilitation
- Storm Drainage System Maintenance Planning
- Stormwater Master Plans
- MS4 Consulting

STUDIES/MODELING

- Feasibility Studies
- Watershed Management Planning
- Hydrologic, Hydraulic, and Water Quality Modeling
- Water Quality Studies and Sampling
- Site Specific Stormwater Studies
- Sour Analysis
- Riverine and Coastal Studies

DESIGN

- Geotechnical, Groundwater, and Infiltration Evaluation
- Stormwater Master Plans
- Stormwater Capital Improvement Construction Plans
- Structural Design
- Roadway Design
- Traditional Pavement/Pervious Pavement
- Regional Best Management Practices
- Canal/Riverine Improvements
- Stormwater System Remediation/Rehabilitation
- Storm Drainage System Maintenance Planning
- Permitting Assistance

CONSTRUCTION

- Bid Assistance
- Construction Observation
- SWPPP Book Preparation
- Project Closeout

FEMA RELATED SERVICES

- Base Flood Elevation Determination
- Hydrologic & Hydraulic Analysis
- Community Consulting
- GIS Integrated FEMA Analysis and Mapping
- Letter of Map Revision/Letter of Map Amendments
- Public Assistance/HMGP/Other Funding Assistance



principle in our vision of client care standards. The project team assembled is dedicated to meeting the needs of the City of Isle of Palms. Thomas & Hutton's Mount Pleasant office is staffed with over 80 employees that are always easily accessible. Our dedicated project team has an abundance of employees and technical resources available to meet client demands, schedules, and budgets. Employees and resources can be brought in, as necessary, to complete the required tasks, should the situation warrant. As our team has succeeded in the past, we will assure that project tasks are efficiently completed according to the project scope, schedule, and budget.

The Thomas & Hutton team works closely with our clients maintaining open and consistent lines of communication to ensure project deliverables, schedules, and budgets are clear from the commencement of the project. Our firm keeps our clients informed of project progress by sending periodically updated plans throughout the design process.

STORMWATER MANAGEMENT: GENERAL OVERVIEW OF SERVICES

Thomas & Hutton's team of surveyors, engineers, hydrologists, and GIS specialists provide state-of-the-art technological services for small, medium, and large-scale projects. We utilize GIS data, analytical tools, and spatiotemporal reasoning to assist clients throughout all phases of a project. Through careful master planning, Thomas & Hutton can develop automated processes to establish precise, up-to-date maps and data for the planning and design phases.

DRAINAGE AND WATERSHED STUDIES

Thomas & Hutton has conducted literally hundreds of drainage and watershed studies. The studies have been conducted for numerous public sector clients including all branches of government: municipal, county, state, and federal, as well as for private sector clients. These studies have been conducted for various purposes including:

- Stormwater Master Planning
- Capital Improvement Project Design
- Pre- and Post-Development Analysis
- Infiltration-Based Drainage Systems
- Stormwater System Capacity Upgrades
- Flood Control
- Base Flood Elevation Determination and Floodplain Mapping
- Water Quality Improvement

One of the principal components of drainage and watershed studies is management and integration of large quantities of geography-based data. Thomas & Hutton has integrated Geographic Information Systems (GIS) data in our drainage and watershed studies and has leveraged the GIS data for our clients. This also enables Thomas & Hutton to provide the data back to the client in an easily accessible format.

Realizing access to up-to-date and detailed geographic data is crucial to our ability to react quickly and comprehensively to our clients' requests and project needs, Thomas & Hutton maintains and constantly updates a geographical database of information that can be deployed at a moment's notice. Thomas & Hutton is committed to employing available data to the fullest extent possible and integrating the latest technologies as needed.

HYDROLOGIC/HYDRAULIC ANALYSIS AND DESIGN

Thomas & Hutton has extensive experience in hydrologic and hydraulic modeling and design. Our knowledge and experience in developing and applying models extend from simple site-scale analyses to comprehensive and complex basin-wide watershed analyses. The following is a partial list of models utilized by Thomas & Hutton on recent projects:

- Interconnected Pond Routing (ICPR), Ver. 3 and 4
- DHI MIKE 11
- XP-SWMM
- HEC-1/HEC-2
- HEC-HMS/HEC-RAS
- Sanitary and Storm Analysis (SSA)
- Hydra Flow
- HY-8 Culvert Analysis
- SRH2D

Whether a large-scale watershed analysis or a small site-scale design analysis, Thomas & Hutton knows that it is not the model technology that makes a project successful, it is the people and their local experience and expertise that make a project successful. Thomas & Hutton has exhibited a long-term commitment to being a leader in the Lowcountry's stormwater management. Our extensive, practical experience in the area of hydrologic and hydraulic analysis and design can assist the City in meeting the challenges of maintaining and operating an effective stormwater management system.

CULVERT ANALYSIS AND DESIGN

Culvert analysis and design is a challenging design category in low-lying areas with minimal topographic relief. With our



numerous water bodies and wetland systems and the need to cross them with roads, the use of culverts (and many times, the need to improve them) is extensive. Thomas & Hutton has extensive capabilities in the design and analysis of culverts and the special attention needed for this type of infrastructure.

CLOSED SYSTEM ANALYSIS AND DESIGN

Closed system analysis customarily is conducted utilizing several different hydrologic methods for determining peak runoff rates and the Manning's equation (or other similar equations) for calculating the hydraulic grade line (HGL) of the flow in the closed system. In addition, the analysis checks for inlet and outlet pipe control situations. Inlet (i.e. grate or hood) capacity must also be addressed as part of the closed system analysis or design.

Thomas & Hutton utilizes specially developed spreadsheets that partially automate the analysis and design of closed systems and can easily be communicated with others. For larger and more complex analyses and designs, Thomas & Hutton implements more advanced software (i.e. StormCAD) that integrates the peak flow analysis with the design/analysis of the pipes and inlets.

SPREAD ANALYSIS AND RECOMMENDATIONS

Similar to closed systems, several different hydrologic methods can be employed to analyze and design for gutter spread. The Manning's flow equation (or other similar equations) is used to determine the depth of flow in a gutter (or other) section. Gutter spread analyses also address appropriate sizing for inlet capacity.

Thomas & Hutton utilizes specially developed spreadsheets that partially automate the analysis of gutter spread and can easily communicate the analysis and design to others. Similarly, for larger and more complex analyses and designs, we implement more advanced software (i.e. StormCAD).

WATER QUALITY ANALYSIS/BMP DESIGN

Thomas & Hutton is a leader in stormwater engineering and has provided real solutions for water quality problems throughout the coastal areas of South Carolina, Georgia, and North Carolina. With the ever-increasing strain of stormwater run-off on the tidally-influenced receiving waters of the area, Thomas & Hutton is uniquely qualified to provide our practical knowledge of addressing stormwater quality problems.

SCOUR ANALYSIS AND RECOMMENDATIONS

Whether designing scour protection for a simple pipe outfall or protecting a bridge from failure due to scour, Thomas & Hutton employs a deliberate and site-based approach to the analysis of design. Based on various criteria (costs, size, risk of damage from failure, etc.), Thomas & Hutton can select and recommend the proper approach and design criteria for use in preventing or mitigating the effects of scour. For smaller issues, design nomographs readily available from local design manuals or references can be applied. For more complex situations (i.e. bridge scour), the procedures and recommendations of HEC-23 "Bridge Scour and Stream Instability Countermeasures: Experience, Selection, and Design Guidance" may be more appropriate.

PUMP ANALYSIS AND DESIGN

Thomas & Hutton has extensive experience and capabilities in analyzing and designing stormwater pumping systems. We have completed several large-scale stormwater pumping station projects in the past. Our services have included watershed analysis, site selection and design, pump station design and phasing plans, pump selection and bidding, and start up. We were previously selected by the City of Charleston to analyze and design improvements for a watershed served by an existing undersized pump station. The project included the cost analysis of a new pump station and an alternative gravity outfall system.

ROADWAY DESIGN

The Thomas & Hutton team has the skills and knowledge to accommodate any potential roadway design needs necessary for this project. Our experience covers a wide range of project types including interstates, interchanges, roundabouts, widenings, intersection designs, and signal designs. We have experts available to handle drainage issues, traffic safety issues, construction issues, or any other concerns that may arise during the design process. Our engineers are well versed in all the local, state, and federal guidelines, the steps needed to complete a set of roadway design plans, and the submittals necessary to obtain the network.

CIVIL ENGINEERING

Thomas & Hutton is a leader in providing civil engineering solutions for a variety of projects throughout South Carolina. We understand the special needs of this sensitive area and evaluate the individual needs of each project carefully. Our engineers work closely with our surveyors to understand the existing conditions of the project, such as drainage and other



utility systems. Once a survey has been completed for a site, our engineers put "boots to the ground" by walking the site with a survey in hand to further their understanding of the existing conditions. One particular aspect of projects in coastal areas that requires careful consideration is stormwater control. We work closely with SCDHEC and other regulatory agencies to provide solutions to the drainage problems commonly found in low-lying areas. In addition to storm drainage systems for site developments and environmental design, our experience includes grading and paving design for roads and parking lots, studies and surveying, database preparation, concept development, preliminary plans, coordination of environmental consultants, assistance with federal, state, and local permitting, bridges, utilities, and construction administration.

EROSION AND SEDIMENT CONTROL DESIGN

Thomas & Hutton has developed an extensive erosion and sediment control (E&SC) design process (with standard symbols and details) based on the procedures and details recommended by South Carolina Department of Health and Environmental Control – Bureau of Water standards. The E&SC plans are easily communicated to the various review agencies and (if properly installed and maintained) can be demonstrated to meet state required standards.

PERMITTING & GRANT/FUNDING EXPERIENCE

Thomas & Hutton has developed and maintains strong professional relationships with representatives from various state resource agencies, the Corps of Engineers, and local, state, and federal regulatory agencies within our service region. These established relationships ensure timely discovery and resolution of any project issues identified during the course of a project and aid in expediting the permitting process.

We have also worked with multiple funding sources such as FEMA Mitigation Assistance and the Coastal Incentive Grants (CIG), which is a competitive pass-through sub-grant program made possible by a grant to DNR from the National Oceanic and Atmospheric Administration (NOAA). We have assisted multiple communities in accessing these federal funds (along with local matching funds) to develop master plans such as that being requested in this RFP.

EXAMPLE PROJECTS AND REFERENCES

The following five projects are representative of large-scale drainage improvement projects that Thomas & Hutton has provided services for within the last five years. The contact information for a client reference familiar with our work is included at the end of each project description.

OLD VILLAGE WATERSHED STUDY AND DRAINAGE IMPROVEMENTS DESIGN

MOUNT PLEASANT, SOUTH CAROLINA

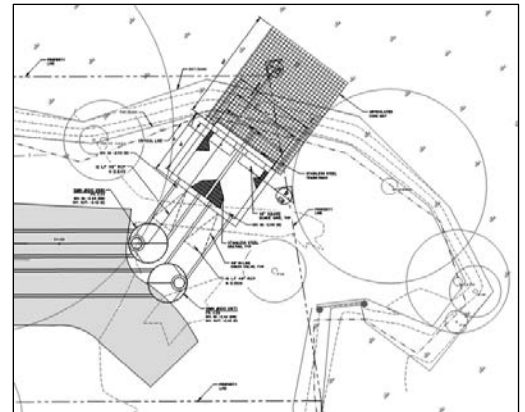


The Town of Mount Pleasant retained **THOMAS & HUTTON** to complete a comprehensive study of the Old Village Watershed. The study was commissioned to study the hydrology and hydraulics of the area, assess and make a formal report on the conditions of the Town's existing drainage system, and recommend infrastructure improvements. The Old Village study area has been identified as part of the Town's stormwater infrastructure in need of critical repair due to system/structural failures, issues related to tidal influences and sea level rise, and a lack of full engineering design at the time it was constructed. Before repairs and improvements to the stormwater infrastructure could be designed and constructed, an assessment of the existing drainage systems and problems needed to be performed.

The study included the following tasks:

- Data collection, including the Town's existing GIS stormwater inventory database, as-built drawings, construction permits, drainage service requests, and FEMA claims information
- Field inspections/survey to confirm/refine basin delineations and the existing stormwater inventory
- Development of a ranking system to prioritize drainage improvement needs
- A stormwater system assessment to determine the existing conditions level of service (LOS) of the stormwater infrastructure
- A future conditions assessment to determine the potential level of service of the stormwater infrastructure based on the estimate of redevelopment in the study area and incorporating researched changes in rainfall data
- Development of existing and future conditions hydrologic/hydraulic models
- Recommendations on drainage improvement scenarios and probable costs for multiple design storm events

As a result of the Old Village watershed study performed by **THOMAS & HUTTON** for the Town of Mount Pleasant, the Town determined that drainage improvements should be undertaken in the two identified highest priority watersheds, Royall Avenue and Edwards Park. Thomas & Hutton was retained by the Town to provide design, survey, permitting, utility relocation, and construction oversight services for the drainage improvement projects. The required improvements in the two watersheds (132 acres and 138 acres, respectively) will include tens of thousands of linear feet of pipe improvements/extensions, improvements related to delayed maintenance (mainly associated with swales and small driveway culverts), new inlet structures, pump station rehabilitation, and outfall improvements to address tidal influences. In addition, an alternate gravity outfall corridor was identified that will divert approximately 3/5 of the contributing area to the existing pump station and allow it to function at the intended design level.



The H&H analysis and calculations will be conducted in conformance with the requirements of the Town, SCDHEC, and SCDOT. The proposed improvements will be refined and adjusted based on the findings of the H&H calculations. The alignment of the proposed improvements may be adjusted based on various factors including noted conflicts, economics, constructability, etc.

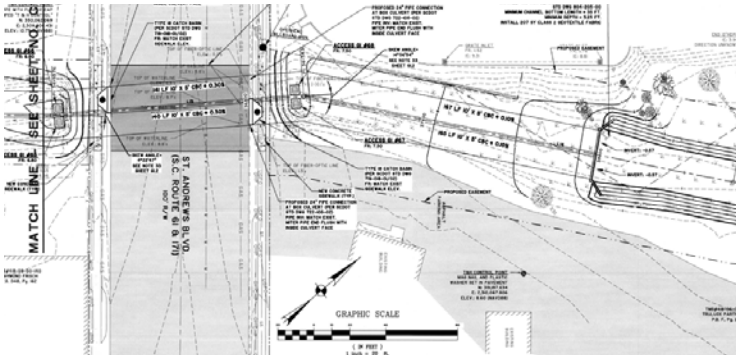
Thomas & Hutton is currently providing survey, design, permitting, plans production and other services for the design of the proposed improvements. The proposed improvements for the Royall Avenue and Edwards park basins are currently estimated at \$12M.

CLIENT:	Town of Mount Pleasant
CONTACT:	Ken Rhye, 100 Ann Edwards Lane, Mount Pleasant, SC 29464, 843.849.2202, krhye@tompsc.com
COMPLETED:	2017
TEAM:	Richard Karkowski, PE, PH, CPSWQ, D.WRE; Hillary Aton, PE; Elliotte Quinn, PLS; Ken Nagel, PE; Mark Yodice, PE; Jen Hayes, PE, LEED AP, CPM; Bryan Shriver, PE (Terracon); Andy Ruocco, MS (Terracon)



FOREST ACRES DRAINAGE IMPROVEMENTS STUDY AND PHASE 1 DESIGN

CHARLESTON, SOUTH CAROLINA



The City of Charleston is improving the stormwater collection and conveyance system in the Forest Acres and 5th Avenue drainage basins in the West Ashley area of the City. The existing drainage systems in the two drainage basins were typified by undersized channels and road culvert systems. Drainage in the Forest Acres drainage basin is conveyed to an undersized stormwater pump station that outfalls through a limited gravity system in the 5th Avenue drainage basin.

The City retained **THOMAS & HUTTON** to confirm the need for the proposed improvements and design the initial phase of the improvements to increase the basins' outfall capacity. Thomas & Hutton's services included hydrologic and hydraulic modeling, conceptual design, public input coordination, and cost estimating. Based on the analysis of various factors, including drainage and flood control effectiveness, life cycle costs, environmental impacts, and others, Thomas & Hutton recommended that the City implement a gravity drainage option as the Phase 1 improvements for the basins. Thomas & Hutton worked with the City and other stakeholders to provide an effective project, with minimal environmental impact that could be efficiently operated and maintained.

After the findings and recommendations of the Drainage Improvements Study was provided to the City, Thomas & Hutton was retained to provide design, permitting, and bid phase services for the first phase of improvements in the combined Forest Acres/5th Avenue drainage basin. This project includes the survey, design, and permitting of the basin's main outfall system. The proposed Phase 1 improvements include over 2,500 linear feet of box culvert improvements, 2,000 linear feet of channel improvements, and improvements to various secondary systems in the 450-acre watershed.

The Phase 1 design project included coordination and permitting with the South Carolina Department of Transportation, South Carolina Health and Environmental Control (including OCRM), and US Army Corps of Engineers. The project also includes the coordination of utility relocations with SCE&G (for gas and overhead power), Charleston Water Systems (for water and sewer), AT&T (for telecommunications), and various other minor utilities (traffic control, cable, etc.).

Thomas & Hutton is currently providing construction administration services for the approximately \$10 million construction contract, which reached substantial completion in January 2018 (four months ahead of schedule). Thomas & Hutton also provided public outreach and communication services and coordinated independent laboratory quality assurance/quality control testing, vibration monitoring, and stormwater pollution prevention plan inspections. Thomas & Hutton is currently under contract with the City for design and construction phase services for Phase 2 of the project.

CLIENT:	City of Charleston
CONTACT:	Steven Kirk, 2 George Street, Suite 2100, Charleston, SC 29401, 843.579.7682
COMPLETED:	2012
TEAM:	Richard Karkowski, PE, PH, CPSWQ, D.WRE; Hillary Aton, PE, Elliotte Quinn, PLS; Ken Nagel, PE, Jen Hayes, PE, LEED AP, CPM



OCTOBER 2015 FLOOD DISASTER RECOVERY CHARLESTON COUNTY, SOUTH CAROLINA



Since the historic flooding event of October 2015 throughout South Carolina, **THOMAS & HUTTON** has been assisting Charleston County in various recovery, restoration, and mitigation efforts. After the event, Charleston County was faced with the daunting task of restoring and repairing an extensive network of roads and drainage channels. Charleston County maintains hundreds of miles of drainage canals, stormwater ditches, and unpaved roadways, including canals and roads that are listed on the national register of historic places. Charleston County also assisted several municipalities within the County with recovery, restoration, and mitigation efforts.

Initially, Thomas & Hutton worked as a sub-consultant to the disaster recovery specialist, Rostan Solutions, LLC (Rostan). Rostan, with Thomas & Hutton's assistance, is coordinating with the Federal Emergency Management Agency (FEMA) and South Carolina's Emergency Management Division (SCEMD) on Charleston County's disaster recovery.

During the initial months after the flood event, Thomas & Hutton conducted investigations focused on documenting the extent and severity of damages at each road and identifying potential mitigation measures available to lessen the severity of impacts from future storms. Damages ranged from general loss of surface material and roadway profile degradation to extensive road base failure, requiring full road reconstruction. Culverts under many of the roads were also damaged from the event.

Thomas & Hutton inspected approximately 45 individual roads, totaling approximately 60 miles in length. Detailed reports were prepared for each road that documented the damages, estimated repair and restoration costs, and identified potential mitigation improvements that could be made. Over \$17 million in road damages were identified.

In addition to inspecting damaged roads during the initial months after the event, Thomas & Hutton conducted inspections of various County-maintained drainage canal systems (including culverts and other system features). Thomas & Hutton inspected six individual canal systems, totaling approximately 6.5 miles in length. As with the roads, a detailed report was prepared for each canal system documenting the damages, estimated repair and restoration costs, and identified potential mitigation improvements that could be made. Over \$1.4 million in canal damages were documented. The road and canal system damage information has been provided to FEMA for incorporation into project worksheets and has formed the basis for the County's request for public assistance.

CLIENT:	Rostan Solutions, LLC/Charleston County
CONTACT:	Sam Rosania, Executive Vice President, 3433 Lithia Pinecrest Road, Suite 287, Valrico, FL 33596, 813.505.1313 (Rostan) Jim Neal, Director, 4045 Bridge View Drive, North Charleston, SC 29405, 843.202.7600, jneal@charlestoncounty.org (Charleston County)
COMPLETED:	August 2016
TEAM:	Richard Karkowski, PE, PH, CPSWQ, D.WRE, Hillary Aton, PE

SULLIVAN'S ISLAND DRAINAGE IMPROVEMENT PROJECT

SULLIVAN'S ISLAND, SOUTH CAROLINA



The Town of Sullivan's Island (Town) is a barrier island approximately 3.2 miles long and 0.75 miles wide, with an estimated 1,000 parcels. The stormwater collection system was installed 60 to 80 years ago, prior to the development of the community. At that time, development was minimal on the Island and stormwater runoff was significantly less than the amount the drainage system is currently handling. Over time, large amounts of new development and changes in use have led to an increase in stormwater runoff ultimately exceeding the overall capacity of the existing stormwater collection system where it does exist.

A severe storm event took place October 1-5, 2015 and produced a total rainfall of approximately 14.1 inches. The amount of precipitation significantly exceeded the design for much of the stormwater drainage infrastructure throughout the Town, damaging several roadways, as well as private, public, and historic-designated properties on all sides of the Island. The

Town subsequently hired **THOMAS & HUTTON** to study the Island to identify priority project areas to install infrastructure improvements to alleviate flooding in the most severely impacted areas.

Thomas & Hutton identified project areas which were characterized by substantial new development with little to no formal drainage. The shortage of detention storage, undersized drainage structures, and lack of any drainage pipes and inadequate outfall capacity are the primary causes of flooding problems in certain areas. To ensure the Sullivan's Island stormwater collection system meets the demands of the population and abides by new regulations, codes, and standards, Thomas & Hutton proposed a multi-site stormwater improvement project.

The project scope of work consists of best practices that have been proven to successfully mitigate and minimize flood related damages. To ensure that the project is compliant with all appropriate regulations, a preliminary Hydrologic and Hydraulic (H&H) Study is underway, ahead of final engineering and design of the improvements. Two basins were selected as the highest priority. The Station 18/Atlantic Avenue basins (Basins 7, 8, and 9) are contained within approximately 0.2 miles and house the U.S. Coast Guard Historical District designated on the National Register of Historic Places. The Marshall Boulevard/Brownell Avenue basins (Basins 15, 16, and 19) are contained within an estimated 0.3 miles and consist of approximately three blocks of residential properties.

A study included the following tasks:

- Data collection, including the Town's existing GIS stormwater inventory database, historic information, FEMA claims information, and Thomas & Hutton in-house data files
- Field inspections/survey to confirm/refine basin delineations and the existing stormwater inventory
- Utilizing information from the data collection exercise, field inspections, and research of available topographic, soils, land-use, and tidal data
- A ranking system resulting in the selection of two of the identified drainage basins with the most critical needs for designing and constructing improvements
- Development of existing and future conditions hydrologic/hydraulic models
- Recommendations for drainage improvements
- Opinion of probable cost for the stormwater improvements

Based on the results of the study, Thomas & Hutton proposed drainage infrastructure improvement projects (with resulting costs) and assisted with the preparation and submittal of a FEMA Hazard Mitigation Grant Program (HMGP) grant application. The Town was awarded a FEMA HMGP under DR-4241. The final H&H Study and development of construction plans commenced in early 2018.

CLIENT:	Town of Sullivan's Island
CONTACT:	Andy Benke, 1610 Middle Street, Sullivan's Island, SC 29482, 843.883.3198
COMPLETED:	Ongoing
TEAM:	Mark Yodice, PE; Richard Karkowski, PE, PH, CPSWQ, D.WRE; Ned Fernandez, CFM (Arcadis)



DRAINAGE, SIDEWALK, AND CROSSWALK IMPROVEMENT PROJECTS

CHARLESTON COUNTY, SOUTH CAROLINA



THOMAS & HUTTON has been selected for 16 on-call drainage improvement projects and six on-call sidewalk/crosswalk improvement projects for Charleston County from 2006 to present.

Project activities included coordination between the County, Town officials, SCDOT, and affected property owners. Field activities included topographic surveys, pipe videoing, wetland investigations, and the determination of jurisdictional freshwater wetland limits and OCRM critical lines. The design surveys of each area included existing drainage and utilities, roadways, adjacent structures, wetland lines, and trees/landscaped areas.

Designs were developed based on field survey data, available mapping, and field investigations.

Proposed drainage, sidewalk, and pathway improvements were designed, and construction drawings were developed in accordance with the policies and practices of the SCDOT and Charleston County.

Additional activities included assisting with public meetings, preparation of technical specifications for all non-standard materials, and development of opinions of probable construction costs.

Completed or ongoing projects include:

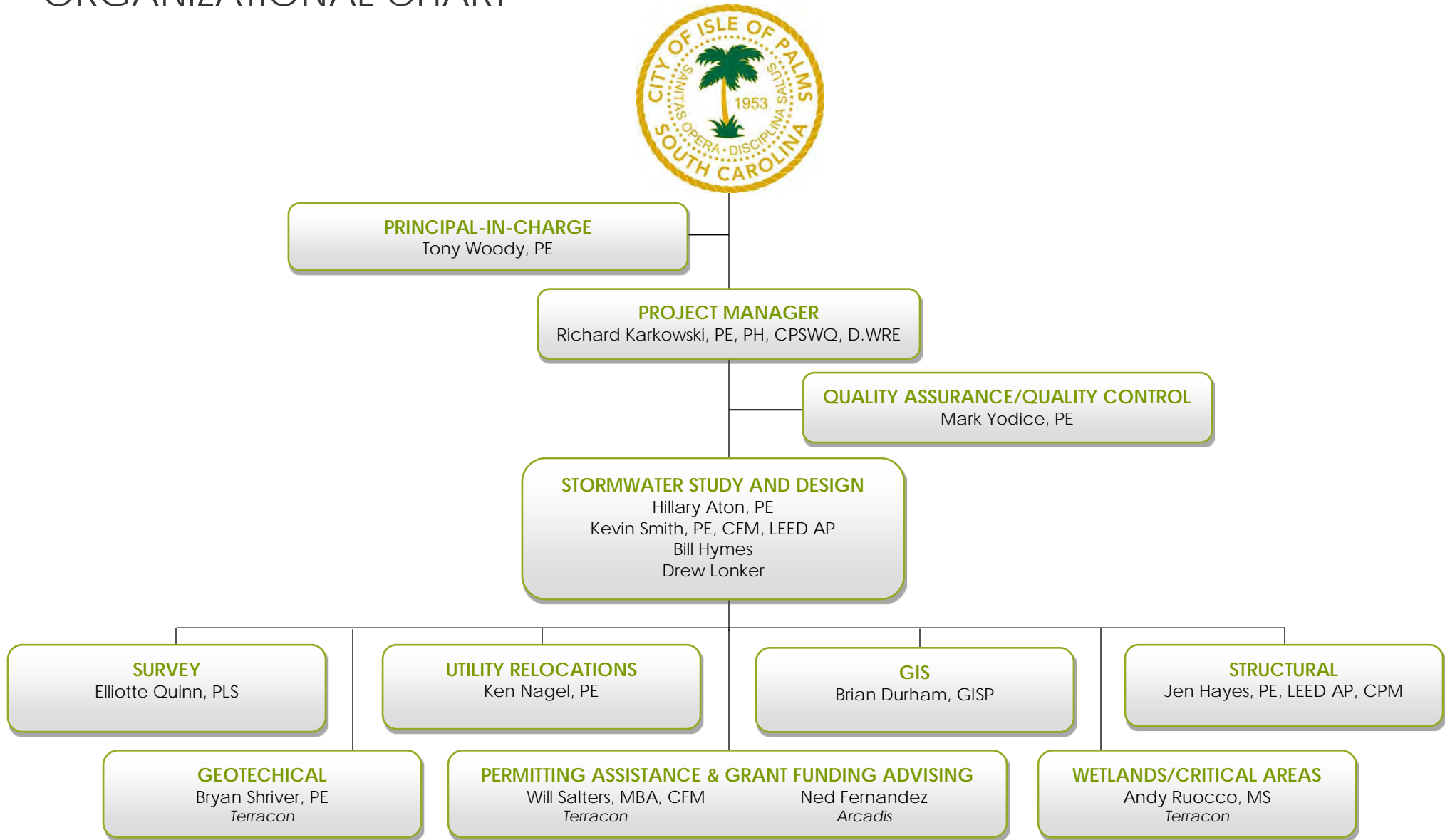
- Old Georgetown Road Damage Repairs, McClellanville
- Steamboat Landing Road Damage Repairs, Edisto Island
- S. Grimball Road Drainage Improvements, James Island
- Phillips Community Drainage Improvements, Mount Pleasant
- Morrison Court Drainage Improvements, McClellanville
- Pinckney St Drainage Improvements, McClellanville
- N. Alert Rd Drainage Survey and Easement Plats, McClellanville
- Sta 19 and 21/22 at I'On Ave Drainage Improvements, Sullivan's Island
- 10th Street East Drainage Improvements, Folly Beach
- Legareville Drainage Improvements, James Island
- 3rd Street East Drainage Improvements, Folly Beach
- Lauden Street Drainage Improvements, Isle of Palms
- Lincolnville Drainage Improvements, Phase I/II
- Morrison Street Drainage Improvement, Folly Beach
- Sparrow Drive Drainage Improvements, Isle of Palms
- 6th Street East Drainage Improvements, Folly Beach
- 4th Street West Drainage Improvements, Folly Beach
- St. Pauls Drainage Study
- West Hudson Drainage Improvements, McClellanville
- Highway 61 Phase 2 and 3 Sidewalk Improvements, West Ashley area, Charleston
- Ben Sawyer Multi-Use Pathway Project, Mount Pleasant/Sullivan's Island
- Croghan's Landing Sidewalk and Crosswalk Improvements, West Ashley area, Charleston
- Camp Road/Dills Bluff Road Sidewalk Improvements, James Island
- Crosswalk Improvements, Ben Sawyer at Rifle Range, Mount Pleasant
- SC 171 Crosswalk Improvements, West Ashley area, Charleston

CLIENT:	Charleston County Transportation Department
CONTACT:	Jim Armstrong, 4045 Bridge View Drive, Suite C-204, North Charleston, SC 29405, 843.202.6140
COMPLETED:	Various
TEAM:	Ken Nagel, PE; Richard Karkowski, PE, PH, CPSWQ, D.WRE; Hillary Aton, PE





ORGANIZATIONAL CHART





PROJECT PERSONNEL

Thomas & Hutton brings decades of water resources management, stormwater system assessment, and civil engineering and design experience to address the many facets of the services needed to successfully complete the City of Isle of Palms' Phase 3 Drainage Outfall Design and Permitting.

The Thomas & Hutton team includes a group of experienced staff from a wide variety of disciplines, including engineers, hydrologic and hydraulic (H&H) modelers, GIS specialists, environmental scientists, geotechnical engineers, and structural engineers, among others to address all the needs and requirements of the project. Our organizational chart outlines the leadership and expected roles of team members. Detailed information on personnel can be found in their resumes (*located in the at the end of this section*).

Richard Karkowski, PE, PH, CPSWQ, D. WRE will serve as the team's **PROJECT MANAGER** and will lead the effort for the City's Phase 3 Drainage Outfall Design and Permitting. Rick is Thomas & Hutton's Water Resources Department Manager and coordinates the department's activities, including budget creation and administration, quality assurance/quality control, training, supervising, and scheduling personnel. In addition, he serves as a technical resource and has an extensive background in hydrology/hydraulics, stormwater runoff management, erosion and sediment control, water quality assessment, flood studies/mapping, and regulatory compliance. A Professional Engineer in SC (18837), as well as in GA, NC, and FL, Rick will be the primary contact for the City and will coordinate all major activities performed by the team.

Tony Woody, PE will serve as **PRINCIPAL-IN-CHARGE** providing project delivery oversight, periodic contact with the City, and assure the best resources are applied to the project. As a Vice President and Civil Department Manager for Thomas & Hutton's Charleston office, his 29 years of experience includes site development and public infrastructure projects for both public and private clients. A Professional Engineer in SC (14545) and NC, Tony has extensive experience in management of design personnel, budgets, and schedules.

Mark Yodice, PE will be the **QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) MANAGER** providing senior review for the work. A Professional Engineer in SC (13293) and NC, his experience of 33 years includes storm drainage systems, grading and paving design for roads and parking lots, drainage studies, retrofit projects, capacity analyses, and stormwater system design.

Hillary Aton, PE is a **WATER RESOURCES ENGINEER** in Thomas & Hutton's Charleston office and will serve various roles in supporting the development of the drainage outfall design and permitting. With over six years of concentrated experience in the areas of water resources management, nearly exclusively in the coastal areas of South Carolina, and a Professional Engineer in SC (33521) and MD, she will support the team in various tasks such as data analysis, GIS mapping and analysis, hydrologic and hydraulic modeling and design, plan production, etc.

Kevin Smith, PE, CFM, LEED AP is a **WATER RESOURCES ENGINEER** with 19 years of experience in drainage and site development projects. His design experience is multi-disciplined and includes all aspects of small and large-scale drainage projects, residential site development, and commercial site development. A Professional Engineer in SC (23552), as well as GA, NC, and MO, Kevin will serve various roles in supporting the development of the drainage outfall design and permitting.

William (Bill) Hymes will serve as a **WATER RESOURCES DESIGNER** and has experience in planning, analyzing, and designing water resource-related projects, including stormwater drainage systems and water quality systems. He is experienced in the application of various types of hydrologic, hydraulic, and water quality models. Bill will assist with hydrologic and hydraulic modeling.

Andrew (Drew) Lonker is a **WATER RESOURCES DESIGNER** with two years of experience in site development and drainage projects. His design experience includes drainage development, hydrologic and hydraulic studies, stormwater modeling, storm drainage design, preparation of permit documents, technical specifications, and construction drawings. Drew has experience with stormwater modeling software including SSA, WHAFIS, and ICPR4. He will serve various roles in supporting the development of the drainage outfall design and permitting.

Elliott Quinn, PLS will serve as **SURVEY MANAGER** and has 37 years of experience with many types of engineering and development projects, as well as general land surveying, for a variety of projects primarily located in South Carolina. He is a Professional Land Surveyor in SC (10292), as well as NC and GA.



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Ken Nagel, PE will be the **UTILITY RELOCATION COORDINATOR**. A Professional Engineer in SC (18059), as well as NC and GA, he is a Project Manager/Engineer who has over 26 years of experience designing and permitting a variety of road and drainage improvement projects primarily located in the coastal areas of South Carolina. These road and drainage improvement projects have included the design of storm drainage systems, grading and paving design for roads and pathways/sidewalks, and crosswalk designs.

Brian Durham, GISP will be the team's **GIS ANALYST**. He has 11 years of GIS professional experience, including web-based GIS applications, mobile GIS, spatial data analysis, map standards creation and implementation, 3-dimensional modeling, data acquisition, database design, data interoperability, programming, and data organization. Brian will manage the day-to-day GIS data collection, analysis, and display that is anticipated for the project. He will also coordinate the integration of the stormwater inventory and assessment work with the GIS database.

Jennifer Hayes, PE, CPM, LEED AP will be the **STRUCTURAL ENGINEER** and has 18 years of experience, including analysis, design, and construction management of federal, commercial, healthcare, municipal, educational, industrial, and residential structures. Her experience with existing structures includes failure and deficiency analysis, as well as historic structure analysis. Jen is a Professional Engineer in SC (24727), as well as NC and FL. She is also a LEED Accredited Professional with detailed knowledge of sustainable design approaches and energy conservation measures and is a Certified Project Manager.

Bryan Shiver, PE is the **GEOTECHNICAL ENGINEER** and serves as a Senior Project Engineer in Terracon's Charleston office. A Professional Engineer in SC (27816), Bryan has gained experience on various types of geotechnical assessments, including water/wastewater investigations, residential, commercial, industrial, and transportation projects and has been involved in environmental site assessments, as well as construction oversight and quality control on many of his projects.

Will Salters, MBA, CFM will provide permitting assistance and grant funding advising for the project team. He is a Senior Scientist with 16 years of professional experience with specific expertise in environmental planning, coastal policy, floodplain management, hazard mitigation planning, emergency management and regulatory permitting. Driven by opportunities to connect technical science with state and local policy, Will has dedicated his career to promoting and protecting fragile coastal environments and has emerged as one of the most trusted, respected, and well-connected leaders in his field throughout South Carolina and the southeast region.

Andy Ruocco, MS, LEED AP BD+C is an Environmental Department Manager at Terracon with 15 years of professional experience. He will lead all **WETLANDS/CRITICAL AREAS PERMITTING** efforts. Andy's education and years of environmental and regulatory compliance experience have resulted in the development of specialized multi-disciplinary skills for use on wetland disturbance, urban and water development, transportation and industrial development, and corridor assessment/restoration projects. His areas of expertise includes project management involving Section 404/401 Clean Water Act permitting, mitigation analysis/design, development of complex alternatives analyses to support permitting for various large scale industrial, transportation, utility, and commercial projects. Andy also has expertise in threatened and endangered species surveys, habitat assessments, National Environmental Policy Act (NEPA) documentation, environmental site assessments, subsurface site investigations, environmental permitting and regulatory compliance, and soil and groundwater remediation. Andy serves as an Authorized Project Reviewer (APR) for natural resource services and Phase I environmental site assessments conducted as part of Terracon's quality control process.

Edward "Ned" Fernandez, CFM is a Senior Management Consultant with eight years of professional experience. He specializes in disaster planning, floodplain management, funding, and grants management. Ned provides ongoing support to several state, local, and non-profit organizations with grant application development and management. He has extensive experience developing Hazard Mitigation Assistance (HMGP/PDM/FMA) applications and 406 Hazard Mitigation Proposals, with a specialization in benefit-cost analysis. He has also developed methods for post-disaster loss avoidance assessment, in order to analyze return on investment for flood and wind hazard mitigation projects.

RICHARD KARKOWSKI, PE, PH, CPSWQ, D.WRE | PROJECT MANAGER

682 Johnnie Dodds Blvd., Suite 100
Mt. Pleasant, SC 29464
karkowski.r@thomasandhutton.com
843.849.0200 Office
843.725.5280 Direct

EDUCATION

BS, Civil Engineering, 1989, University of Florida

PROFESSIONAL REGISTRATIONS

Professional Engineer in SC, GA, NC, FL
Professional Hydrologist
Certified Professional in Stormwater Quality
Diplomate, Water Resources Engineer

CORE COMPETENCIES

- Project Management
- Stormwater Drainage Systems
- Water Quality Systems
- Hydrologic & Hydraulic Models
- Water Quality Models

Rick has over 28 years of experience in the planning, analysis, design, permitting, construction oversight, operation and maintenance of water resources-related projects, including stormwater drainage systems, flood control projects, and water quality systems. He is experienced in the application of all types of hydrologic, hydraulic, and water quality models.

PROJECT EXPERIENCE

October 2015 Flood, Public Assistance Support, Charleston County, SC, Project Manager assisting Charleston County in recovery and mitigation work resulting from the devastating October 2015 flood event that dropped as much as 27 inches of rain in some parts of the County. To date, services have included drainage system damage assessments (three regional systems and one large canal), road damage assessments (60 different roads), repair (permanent and mitigation) cost estimating, GIS data management and coordination, and FEMA reimbursement documentation. Future services will include preparation of bid documents, procurement support, construction engineering and inspections, and project close-out.

Forest Acres Drainage Improvements Phase 1, City of Charleston, SC, Project Manager/Engineer for the analysis and design of the initial (Phase 1) improvements to the Forest Acres and 5th Ave Drainage Basins in the West Ashley area of the City of Charleston. The project includes conceptual,

preliminary, and final design of the basin's main outfall system. The proposed Phase 1 improvements include over 2,500 linear feet of box culvert improvements and 2,000 linear feet of channel improvements in the 450-acre watershed. The project included plans production and permitting, including NPDES MS4 approval, SCDOT encroachment, and USACE wetlands disturbance.

Royal Estates Drainage Study, Horry County, SC, Rain events in late 2015 resulted in flooding of garages and first floors for many homes in the Royal Estates subdivision watershed (approximately 30 acres), revealing problems with the drainage system. Project Manager in assisting Horry County with its plans to implement a 3-phased approach to improve the drainage situation in the area. The first and second phases included hydrology and hydraulic model development and alternatives analysis and improvement recommendations. The third phase will include the design and implementation of the recommended improvements.

Folly Beach/Lincolnvile/McClellanville Drainage Projects, Charleston County Roadwise, Charleston County, SC, Provided survey, design, and permitting assistance associated with various roadside drainage areas prone to flooding. Responsibilities included coordination with adjacent property owners and local mayors/utility directors, preparation of maintenance easement plats, and preparation of construction documents.

Lakewood-Pirateland Swash Drainage Basin Study, Horry County, SC, Project Manager/Engineer for the drainage improvement study of the approximately 1,560-acre fully developed basin along US Highway 17 Business between Myrtle Beach and Surfside Beach. Structural flooding of several businesses and homes was recorded in the past. To date, the study included the development of a hydraulic and hydrologic model and identification of drainage issues, alternatives analysis, and recommendations improvements.

Parkers Ferry/South Santee Drainage Evaluations, Charleston County Public Works, Charleston County, SC, Evaluated various alternatives for alleviating flooding occurrences in two rural areas of Charleston County. For the South Santee Drainage Evaluation, we assisted the County in identifying, mapping, and prioritizing of areas of the roadside drainage systems requiring maintenance for completion by the SCDOT. For Parkers Ferry, we assisted the County in identifying and resolving structural flooding issues resulting from an earthen access road located in adjacent wetlands. Tasks included coordination of wetland permitting associated with the installation of culvert cross drains, as well as coordination of land appraisal associated with acquisition of construction and maintenance easements.

Warner Drive Drainage Improvement Study, Richland County, SC, Project Manager/Engineer for the drainage improvement study of two nearly fully developed basins. The Warner Drive study included the analysis of a 157-acre basin and the Danbury Drive study included the analysis of a 163-acre basin. The study included data collection, field reconnaissance, watershed and sub-basin mapping, existing conditions hydrology and hydraulics modeling, presentation of preliminary findings, improvement options listing and screening, selected improvements hydrology and hydraulic modeling, opinion of probable construction costs, presentation of final findings, and recommendation.

TONY WOODY, PE

VICE PRESIDENT/PRINCIPAL-IN-CHARGE

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EDUCATION

BS, Civil Engineering, 1986, North Carolina
State University

PROFESSIONAL REGISTRATIONS

Professional Engineer in SC, NC

PROFESSIONAL AFFILIATIONS

- Low Country Housing Trust, Chairman
- Developers Council of the Charleston
Metro Chamber of Commerce, Past
Chairman
- Charleston Metro Chamber, Member
- Charleston Metro Chamber, Public
Policy Committee
- ACEC, Member
- ULI, Member

CORE COMPETENCIES

- Project Management
- Water Distribution Systems
- Water Storage Facilities
- Booster Pump Stations
- Wastewater Treatment Systems
- Wastewater Collection/Conveyance
- Wastewater Pump Station
- Water/Sewer Modeling
- Sanitary Sewer Evaluations
- Sanitary Sewer Rehabilitations
- Infrastructure Relocations
- Master Planning
- Rate Studies

Tony serves as a Vice President for Thomas & Hutton. His experience of 28 years includes site development and public infrastructure projects for both public and private clients. These projects include design for highways, streets, bike paths, neighborhoods, parks, parking areas, water distribution systems, sanitary sewer collection systems, and storm drainage systems. Tony has extensive experience at the management of design personnel, budgets, and schedules. He brings an in depth understanding of land usage, entitlements, area comprehensive plans and regional priorities to every new project.

PROJECT EXPERIENCE

Omni Commerce Park, Berkeley County, SC. Client Manager for the master planning of the storm drainage, water distribution, and sewer collection systems for a 2.8-million square foot industrial park located on 318 acres. Approximately 800,000 square feet has been designed, permitted, and is under construction.

Blackbaud Corporate Headquarters, Daniel Island, Berkeley County, SC. Project Manager for 175,000-square foot office building with a café, outdoor dining, outdoor amenities, loading dock, and 650 parking spaces located on Daniel Island, in Berkeley County, SC. Thomas & Hutton provided master planning, professional engineering, and permitting for all site grading and infrastructure design. The project is currently under construction.

Carnes Crossroads, Goose Creek, Berkeley County, SC. Project Manager for design of a 2,500-acre Planned Unit Development in the City of Goose Creek, Berkeley County. The development includes a wide array of road and infrastructure projects, multi-family, single-family, and commercial development. Roadways, stormwater systems and sewer infrastructure are reviewed and permitted through Berkeley County. This project is ongoing.

Johnnie Dodds Master Plan Phase 1, Mount Pleasant, SC. Program Manager for the redevelopment master plan for Johnnie Dodds Boulevard from the Ravenel Bridge to the Mark Clark Expressway.

Shem Creek, Mount Pleasant, SC. Program Manager for the redevelopment project at Shem Creek in Mount Pleasant. Services include surveying, master planning, preliminary dock design, permitting, and consulting services with the Town of Mount Pleasant for the master plan.

Porter-Gaud School, Charleston, SC. Project Manager for civil site design, permitting, and construction monitoring for the expansion of Porter-Gaud's existing campus, including the abandonment of an existing SC Department of Transportation (SCDOT) right-of-way, and a new 1,800-foot roadway that accommodates the vehicular stacking needed during drop-off and pick-up times at the K-12 school. Other improvements include 200 parking spaces, 8-lane track, football field, two soccer fields, baseball field, tennis courts, and the infrastructure to serve the new science building, and gymnasium.

River Golf Course at Kiawah Island, Charleston County, SC. Design Engineer and Project Manager for this 300-acre single-family, commercial, and golf course development. The project included nine interconnected stormwater lagoons, which were strategically located to provide aesthetic value to the single-family development and sized to meet the state's minimum requirements for retention/detention and sediment trapping efficiencies, 30,000-square foot clubhouse with associated parking, a 2,500-linear foot entry road, the design and permitting of a new effluent disposal system, a new effluent storage lagoon, and the master planning for the water distribution and wastewater collection system to serve approximately 250 future single-family lots.

Kiawah Island, SC. Project Manager for directed study and design of modification to stormwater system for the over 3000-acre Town of Kiawah Island; system design constraints required maintenance of prior water levels and assurance of no adverse water quality or flooding impacts.

RiverTowne Country Club, Mt. Pleasant, SC. Project Manager for modeling and design of stormwater system to support development of an 800-acre mixed use community containing a golf course, single-family residential and multi-family residential components.

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EDUCATION

BS, Civil Engineering, 1983, Clemson University
MBA, 1985, University of South Carolina

PROFESSIONAL REGISTRATIONS

Professional Engineer in SC and NC

PROFESSIONAL AFFILIATIONS

- AWWA, Member
- WEF, Member
- SCWQA, Member
- Chi Epsilon – Civil Engineers Honor Society, Member
- Rotary – East Cooper Breakfast Club, Member

CORE COMPETENCIES

- Project Management
- Water Distribution Systems
- Water Storage Facilities
- Wastewater Treatment Systems
- Wastewater Collection/Conveyance
- Wastewater Pump Station
- Water/Sewer Modeling
- Sanitary Sewer Evaluations
- Sanitary Sewer Rehabilitations
- Stormwater Drainage Systems
- Environmental Design
- Utility Mergers/Rate Reviews
- Infrastructure Relocations
- Master Planning
- Rate Studies

Mark is a Principal and Project Manager for a variety of projects. His experience of 32 years includes storm drainage systems, grading and paving design for roads and parking lots, drainage studies, retrofit projects, capacity analysis, and stormwater system design.

PROJECT EXPERIENCE

Market Common Development Utility Master Planning, Horry County, SC, Project Manager for the preparation of drainage master plans for a proposed multi-use, high-density development on the former Myrtle Beach Air Force Base. Activities included evaluation of anticipated runoff services, evaluation of various layout alternatives, and preparation of opinion of construction costs.

Baru Island, Columbia, South America, Project Engineer for drainage improvements for a remote island off Columbia, South America. Some uses included three golf courses, 450-room hotel, marina, 500 timeshares, 60 cabins, 1,030 single-family lots, 450 multi-family lots, and beach club on 710 acres of public land.

Rhoden's Island, Charleston, SC, Project Engineer for drainage study to development a stormwater management system. Rhodens Island is an 80-acre island residential subdivision consisting of approximately 150 single family lots. This island is located to the east of Daniel Island, situated between Ralston Creek and the Wando River, and is part of Daniel Island Park development at the north end of Daniel Island. This project includes BMP's to reduce runoff.

Sullivan's Island Stormwater Pump Station, Sullivan's Island, SC, Project Manager and Project Engineer for analyzing options to address a failed storm water pump station at Station 18 and Atlantic Avenue. Investigated the existing drainage basin and collection system associated with the existing storm water pump station at the intersection of Station 18 and Atlantic Avenue. Services included watershed planning/elevation, pump station assessment, alternatives analysis, cost estimating, and recommended improvements.

Shem Creek Drainage Improvements, Charleston County, SC, Project Engineer for drainage investigation and computer modeling to alleviate flooding. Recommend improvements and design said improvements. Basin covers about 54 acres.

Drainage Improvements-Bayonne Avenue, Charleston County, SC, Project Engineer for analysis, study, and computer modeling of a 60-acre drainage basin to identify flooding problems. Report with recommendations and cost projections.

Snee Farm Drainage Study, Charleston County, SC, Project Engineer for study with computer modeling of a 715-acre drainage basin. Recommended improvements to alleviate chronic flooding problems.

Parker Island Drainage Study, Charleston County, SC, Project Engineer for analysis of a 650-acre drainage basin. Recommendations for stormwater control.

Town of Sullivan's Island, Charleston County, SC, Project Manager and Project Engineer to globally assess flooding problems on Sullivan's Island. Determined flood areas and developed concept plans to alleviate flooding, then developed priorities for implementation. Subsequently prepared cost estimates to construct improvements. Provided input into FEMA's DR-4241 Hazard Mitigation Grant application (HMGP).

Morris Square, Charleston, SC, Project Manager and Project Engineer for an urban fill project in the City of Charleston. Smith Morris Neighborhood is in downtown Charleston at the northeast corner of the intersection of Smith Street and Morris Street. The master land use plan for the property had a maximum of 65 residential units plus limited commercial uses within designated zoning districts in less than 2 acres. The project consisted of the creation of two small parks, a playground, an urban corner park, opportunity for a small neighborhood store or café, and the restoration of an abandoned church as a community meeting center. There is one known flooding problem located just off-site. The project used a unique underground stormwater system so as not to increase the nearby flooding problem.

HILLARY ATON, PE | WATER RESOURCES ENGINEER

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EDUCATION

BS, Civil and Environmental Engineering,
2010, The Citadel
MS, Civil Engineering, 2011, Clemson
University

PROFESSIONAL REGISTRATIONS

Professional Engineer in SC, MD

CORE COMPETENCIES

- Water Resources Engineering
- Water Resources Planning
- Water Resource Design
- Permitting
- Stormwater Drainage Systems
- Water Quality Systems
- Hydrologic Modeling
- Hydraulic Modeling
- Water Quality Modeling

Hillary has six years of experience in planning, analyzing, designing, permitting, constructing, operating, and maintaining water resources-related projects, including stormwater drainage systems and water quality systems. She is experienced in the application of various types of hydrologic, hydraulic, and water quality models.

PROJECT EXPERIENCE

Forest Acres Drainage Improvements, City of Charleston, SC, Design Engineer assisting with the bidding process of Phase 1 and for the analysis and design of Phase 2 improvements to the Forest Acres and 5th Ave Drainage Basins in the West Ashley area of the City of Charleston. The project includes conceptual, preliminary, and final design of the basin's main outfall system. The project includes plan production and permitting – including NPDES MS4 approval, SCDOT encroachment, and USACE wetlands disturbance.

Old Village Watershed Study, Mount Pleasant, SC, Design Engineer for a detailed study and improvement recommendations for the Old Village watershed. The project involved the collection and study of data including reports of flooding, service requests, FEMA flood claims, and construction permits. A capacity analysis was performed for the existing stormwater infrastructure, which was then assigned a level-of-service for existing and future runoff conditions. The basins/drainage systems were scored and prioritized to identify the most critical basins in need of improvements.

Old Village Drainage Improvements, Mount Pleasant, SC, Design Engineer for the drainage improvements for the Royall Avenue and Edwards Park basins in the

Old Village. The basis of the design was the recommended drainage improvements from the Old Village Watershed Study. Storm drain analyses were performed using Hydraflow Storm Sewers. The project requires plan production, permitting, and documentation of compliance with Town of Mount Pleasant and State of South Carolina regulatory requirements.

October 2015 Flood - Public Assistance Support, Charleston County, SC, Design Engineer for the Thomas & Hutton team working as a sub-consultant to assist Charleston County in recovery and mitigation work resulting from the devastating October 2015 flood event that dropped as much as 27 inches of rain in some parts of the County over three days. To date, Thomas & Hutton services have included road damage assessments (60 different roads); drainage system damage assessments (three regional systems and one large canal); repair (permanent and mitigation) cost estimating; GIS data management and coordination; and FEMA reimbursement documentation. Future services will include preparation of bid documents, procurement support, construction engineering and inspections, and project close-out.

Arbor Oaks Drainage Study, Summerville, SC, Design Engineer for a detailed drainage study and improvement recommendations for the Arbor Oaks neighborhood. Recent rain events have resulted in severe structural flooding, revealing problems with the drainage system. The first and second phases included hydrologic and hydraulic model development using Advanced Interconnected Channel and Pond Routing (ICPR) and GIS software, and an alternatives analysis and improvement recommendations. The third phase will include the design and implementation of the selected improvements, which may be completed at a future date. The Arbor Oaks watershed drains to the Sawmill Branch Canal.

Bay Road Drainage Study, Horry County, SC, Design Engineer for a detailed drainage study and improvement recommendations for the Bay Road watershed. The study includes hydrologic and hydraulic modeling using Advanced Interconnected Channel and Pond Routing (ICPR) and GIS software, and an alternatives analysis and improvement recommendations. Proposed improvements were designed to improve drainage and motorist safety along Bay Road.

Highway 9 & 57 Drainage Study, Horry County, SC, Design Engineer for a detailed drainage study and improvement recommendations for the main outfall system in the Highway 9 & 57 watershed. Rain events in late 2015 resulted in structural flooding of many homes in the Colonial Charters neighborhood, revealing problems with the drainage system. The first and second phases included hydrologic and hydraulic model development using Advanced Interconnected Channel and Pond Routing (ICPR) and GIS software, and an alternatives analysis and improvement recommendations. The third phase will include the design and implementation of the selected improvements, which may be completed at a future date. The Highway 9 & 57 watershed drains to the Waccamaw River.

KEVIN SMITH, PE, CFM, LEED AP | MS4/INTERLOCAL COORDINATION/GRANTS

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EDUCATION

BS, Natural Resources and Forest Engineering, 1998, SUNY Environmental Sciences and Forestry at Syracuse

PROFESSIONAL REGISTRATIONS

Professional Engineer in GA, SC, NC, MO
Erosion and Sedimentation Control Program
Certified #12473
Certified Flood Plain Manager
LEED Accredited Professional

PROFESSIONAL AFFILIATIONS

- Order of the Engineer, Member
- ASCE, Member
- GA Society of Professional Engineers, Member

CORE COMPETENCIES

- Project Management
- Stormwater Systems
- Hazard Mitigation Planning
- Client Management
- Project Scheduling
- Project Coordination
- Design Team Supervision
- Water Distribution Systems
- Sanitary Sewer Systems
- Sedimentation and Erosion Control Systems
- Hydrologic/Hydraulic Studies
- Permitting
- Construction Cost Analysis

Kevin is a civil engineer with 19 years of experience in drainage and site development projects. His design experience is multi-disciplined and includes all aspects of small and large-scale drainage projects, residential site development, and commercial site development. Experience includes client management, project management, project scheduling, project coordination, design team supervision, calculations and design of water distribution systems, sanitary sewer systems, storm drainage systems, sedimentation and erosion control systems, and hydrologic/hydraulic studies, preparation/review/submittal of permit documents, construction cost analysis, contract documents, technical specifications, and construction drawings.

PROJECT EXPERIENCE

Hazard Mitigation Grant Program Assistance, Tybee, Georgia Subconsultant project consultant responsible for assisting with pre-application submittals for raising of pre-FIRM structures to elevations one foot above the 1% chance base flood elevation. Duties include assistance in identifying project scope, vetting qualified residents, elevation certificate preparation, preparation of general structure assessment checklist, general structure assessments, coordination with specialty contractors for pricing, cost opinions and public outreach.

Hazard Mitigation Grant Program Assistance, Telfair Regional Drainage Project, Garden City, GA, Project Manager responsible for providing information for preliminary and final Hazard Mitigation Grant Program (HMGP) applications to the Georgia Emergency Management Agency. Specific work tasks included preliminary HMGP application forms, hydrologic and hydraulic XPSWMM modeling to determine existing and proposed drainage system levels of service and 0.2% chance drainage improvements, determination of number buildings benefiting from the drainage projects, parcel acquisition, engineering opinion of probable construction costs and associated mapping required for submittal.

Hazard Mitigation Grant Program Assistance, Kingsland & Camden County, GA, Project Consultant responsible for providing information for preliminary Mitigation Grant Program (HMGP) applications to the Georgia Emergency Management Agency. Specific work tasks included assisting with preliminary HMGP application forms, hydrologic and hydraulic modeling using 2-Dimensional ICPRv4 to determine existing and proposed drainage system levels of service and proposed drainage improvements, determination of number buildings, roads and critical

facilities benefiting from the drainage projects, parcel acquisition, engineering opinion of probable construction costs and associated mapping required for preliminary application submittal. This project is ongoing.

Garden City Stormwater Master Plan & CIP Identification, Garden City, GA, Client/Project Manager for the creation of a city-wide stormwater master plan in accordance with Coastal Incentive Grant Cycle 16. Tasks included delineation of major drainage basins, stormwater inventory field reconnaissance, basin assessments, hydrologic/hydraulic analysis using XPSWMM for existing and build-out conditions, identification of exiting system deficiencies, proposed improvement alternatives, generation of CIP list, CIP project costs, and preparation of stormwater master plan. Special districts were recommended where existing stormwater systems were inadequate with repetitive flooding. Special districts included post-development flow and volume requirements that were more stringent than those found in the existing GardenCity Local Design Manual.

GA Air National Guard Base-Wide Stormwater Management Study and Inventory, Savannah, GA, Project Engineer responsible for the preparation of an existing conditions XP-SWMM hydrologic and hydraulic model, stormwater infrastructure conditions assessment, stormwater system modeling (XP-SWMM) of existing conditions and future conditions (accounting for the base's Installation Development Plan). Conducted comprehensive stormwater master planning to address system capacity deficiencies for existing development as well as anticipated future development.

Civil Engineering Stormwater Services, Indefinite Delivery Contract (IDC), Chatham County, GA, Client/Program Manager for the Chatham County Stormwater IDC for study and design of several stormwater capital improvement projects. Typical project tasks include survey, hydrologic/hydraulic analysis, design of channel and closed conduit systems, traffic control, permitting and drainage improvement recommendations/design. Duties include client and project management, resource scheduling, preparation of drainage and grading plans/calculations, technical specifications, contract documents, and bidding of project tasks.

WILLIAM HYMES | PROJECT DESIGNER

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EDUCATION

BS, Civil and Environmental Engineering,
2017, The Citadel

CORE COMPETENCIES

- Water Resources Engineering
- Water Resources Planning
- Water Resource Design
- Permitting
- Stormwater Drainage Systems
- Water Quality Systems
- Hydrologic Modeling
- Hydraulic Modeling
- Water Quality Modeling

Bill has more than a year of experience in planning, analyzing, designing, permitting, constructing, operating, and maintaining water resources-related projects, including stormwater drainage systems and water quality systems. He is experienced in the application of various types of hydrologic, hydraulic, and water quality models.

PROJECT EXPERIENCE

Old Village Watershed Study, Mount Pleasant, SC, Design engineer for a detailed study and improvement recommendations for the Old Village watershed. The project involved the collection and study of data including reports of flooding, service requests, FEMA flood claims, and construction permits. A capacity analysis was performed for the existing stormwater infrastructure, which was then assigned a level-of-service for existing and future runoff conditions. The basins/drainage systems were scored and prioritized to identify the most critical basins in need of improvements.

Old Village Drainage Improvements, Mount Pleasant, SC, Design engineer for the drainage improvements for the Royall Avenue and Edwards Park basins in the Old Village. The basis of the design was the recommended drainage improvements from the Old Village Watershed Study. Storm drain analyses were performed using Hydraflow Storm Sewers. The project requires plan production,

permitting, and documentation of compliance with Town of Mount Pleasant and State of South Carolina regulatory requirements.

NRCS Canal Repairs, Charleston County, SC, Designer that assisted with the preparation of canal repair plans and bid documents for five drainage canals). The work is a part of a Natural Resource Conservation Service (NRCS) grant to the County to address hurricane and flood damage to canals previous constructed by the NRCS. Repairs include bank restoration and stabilization, culvert repair and/or replacement, and culvert end treatment repairs.

Forest Acres Drainage Improvements, City of Charleston, SC, Designer assisting with the analysis and design of Phase 2 improvements to the Forest Acres and 5th Ave Drainage Basins in the West Ashley area of the City of Charleston. The project includes conceptual, preliminary, and final design of the basin's main outfall system. The project includes plan production and permitting – including NPDES MS4 approval, SCDOT encroachment, and USACE wetlands disturbance.

Bay Road Drainage Study, Horry County, SC, Design Engineer for a detailed drainage study and improvement recommendations for the Bay Road watershed. The study includes hydrologic and hydraulic modeling using Advanced Interconnected Channel and Pond Routing (ICPR) and GIS software, and an alternatives analysis and improvement recommendations. Proposed improvements were designed to improve drainage and motorist safety along Bay Road.

Heather Glen, Horry County, SC, Designer assisting with the analysis and design of the stormwater masterplan for the proposed development. The project site is an existing 430-acre tract that is currently an 18-hole golf course. The golf course will close in October 2017 and the property will be redeveloped. The current development plan is for a large-scale master planned community of approximately 1,100 units consisting of a mix of single family lots, duplex units, and amenities.

Cainhoy Plantation, City of Charleston, Berkeley County, SC, Design Engineer for the analysis and design of a stormwater masterplan for the 9,375-acre development. The plantation is currently managed for timber production and is generally undeveloped. The proposed project is to include a mixed-use community plan that includes neighborhoods, schools, retail and recreation. Over 50% of the property will remain undeveloped natural areas, including extensive and extensive wetland sanctuary, 9,000 homes are anticipated to be built on the property. The project consists of large-scale watershed studies and extensive stormwater modeling.

The Parks at Carolina Forest, Horry County, SC, Designer assisting with the analysis and design of the stormwater masterplan for the proposed development. The project consisted of residential housing with an extensive stormwater pond system which required extensive modeling.

Cougar Point Clubhouse, Kiawah Island, SC, Designer for the analysis and design of the stormwater plan for the proposed development of the Clubhouse. The project is a redevelopment of an existing structure to include the addition of stormwater infrastructure. The project requires plan production, permitting, and documentation.

ANDREW LONKER | DESIGNER

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EDUCATION

BS, Civil Engineering, 2016, North Carolina State University

CORE COMPETENCIES

- Drainage Development
- Hydrologic Analysis
- Hydrologic Analysis
- Stormwater Modeling
- Stormwater System Design
- Water Resources Design

Drew is a designer with one year of experience in site development and drainage projects. His design experience includes drainage development, hydrologic and hydraulic studies, stormwater modeling, storm drainage design, preparation of permit documents, technical specifications, and construction drawings. Drew has experience with stormwater modeling software including SSA, WHAFIS, and ICP4.

PROJECT EXPERIENCE

Site Plan Review, City of Richmond Hill, GA, Staff Engineer for performing site plan review for conformance with applicable City of Richmond Hill Codes. Duties include stormwater management plan review for conformance with the City of Richmond Hill Stormwater Ordinance, application completeness review, site plan review, and preparation of comment/recommendation letters to city staff.

Jackson Street Plaza and Parking, Dublin GA, Design Engineer for the Jackson Street Plaza and parking lot. The project is ongoing and includes site and storm drainage design for a plaza area with walkways, water features, and subsequent parking that utilizes pervious pavers, swales, and inlets to facilitate drainage.

Design challenges include a complex grading design scheme to conform to varying finished floor elevations and maintaining ADA routes over a large elevation differential over short horizontal distances. Duties include grading design, storm drainage system design, and plan production.

South Harbor Subdivision, Chatham County, GA, Design Engineer for the development of several existing and proposed condition Wave Height Analysis Flood Insurance Study (WHAFIS) models. These models are used to determine the effects of fill material placed within the floodplain from the construction of residential homes. The study encompassed the modeling of 14 undeveloped residential lots, located on Skidaway Island in Chatham County, GA to determine compliance with the Chatham County Floodplain Ordinance. Duties included site reconnaissance, model development, report development, and exhibit preparation.

Harrington Subdivision, Greenville County, SC, Project Designer for the hydraulic and hydrologic analysis for a 150-acre residential development located in Greenville, SC. The project included subdivision site design, the design of four dry detention ponds, and the design of the corresponding stormwater drainage system. Responsibilities included stormwater drainage modeling, design, and the generation of a stormwater management report. Stormwater models used in design include Hydraflow Hydrographs and Hydraflow Storm Sewers.

Savannah Crossgate Industrial Site, Chatham County, GA, Project Designer for performing hydraulic and hydrologic analysis for a 520,000-square foot industrial building and subsequent parking. The project included grading, storm drainage, and parking area design. Duties included creating an existing and proposed conditions model using Storm and Sanitary Analysis (SSA) to design the site stormwater drainage system as well as generating a stormwater management report for the site.

Confederate Ditch Repairs, Mount Pleasant, SC, Project Designer for a ditch rehabilitation located on the Boone Hall Plantation in Mount Pleasant, SC. The project included grading to rehabilitate a ditch and designing a culvert beneath Oak Ave to better convey stormwater flow. Responsibilities included culvert sizing, ditch grading, and plan production.

South Island Water Reclamation Facility, Hilton Head Island, SC, Project Engineer for performing grading design and stormwater drainage design for the site development of a chlorination building, sludge building, and roadway improvements at a water treatment plant in Hilton Head Island, SC. Roadway design included the widening and realignment of internal roadways for truck access. Duties with the ongoing project include site grading, stormwater drainage design, roadway layout, and loading dock area design.

Shaw Creek Solar, Aiken County, SC, Project Engineer for design plans for the South Carolina Electric and Gas (SCE&G) switchyard located at the future Shaw Creek Solar Farm in Aiken County, SC. The project consisted of switchyard site grading, stormwater drainage system design, and the design of a switchyard access road. Duties included plan production, hydrologic and hydraulic analysis, and permitting through SCDOT, Aiken County, and SCDHEC.

Adger Solar Farms, SC, Design Engineer for the development of conceptual layouts for several solar farms sites throughout the state of South Carolina. Conceptual layout design includes site access point, setback, and buffer layout to determine the feasibility of a proposed solar site. Conceptual layouts were used to determine site and panel layout practicality, as well as to gaged public perception of proposed projects at public meetings.

F. ELLIOTTE QUINN, PLS | INVENTORY/INSPECTIONS SURVEY MANAGER

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EDUCATION

AAS, Civil Engineering Technology – Survey Option, 1980, Midlands Technical College

PROFESSIONAL REGISTRATIONS

Professional Land Surveyor in SC

PROFESSIONAL AFFILIATIONS

- NSPS, Member
- NC Society of Surveyors, Member
- SC Society of Professional Land Surveyors, President, Past District Director, Past Chapter President

CORE COMPETENCIES

- Project Management
- Easements
- Boundary Surveys
- Utility Route Surveys

Elliott has 38 years of experience with many types of engineering and development projects, as well as general land surveying, for a variety of projects primarily located in South Carolina.

PROJECT EXPERIENCE

Seabrook Island Drainage Improvements, Seabrook Island, SC, Survey Manager for coordination and processing of all surveys, drainage study and subsequent improvements for portions of Seabrook Island, South Carolina including all golf courses.

Town of Mt. Pleasant Old Village Drainage Inventory Phase 1, Mt. Pleasant, SC, Surveyor-in-Charge for the stormwater system inventory in the Royall Avenue Watershed utilizing GPS data collection for entry into GIS.

Stormwater System Inventory and Assessment, City of Augusta, GA, Surveyor-in-Charge for the stormwater system inventory in the Rocky Creek Watershed utilizing GPS data collection for entry into GIS.

Parris Island Drainage Study, Beaufort County, SC, Survey Manager for coordination of surveying activities associated with a drainage study of a 1,600-acre portion of the U.S. Marine Corps Parris Island training facility. Surveys included storm water structure inventory including surveyed elevations and locations.

Sullivan's Island Maritime Forest Tree Inventory, Town of Sullivan's Island, SC,

Project Manager of inventory of trees located within the Town owned maritime forest and creating of GIS database for analysis to include trees (species, sizes, condition), buffers, parcel boundaries, OCRM setback lines and zoning data.

Isle of Palms Water & Sewer System Improvements, Isle of Palms Water & Sewer Commission, Charleston County, SC, Surveyor-in-Charge of surveys for multiple projects on the Isle of Palms over the period of 22 years. Surveys have included route surveys for both water and sewer projects, boundary and topographic surveys of treatment plant and pump station sites, and easement platting.

Camp Hall Gas Main, S.C. Electric & Gas Company; Berkeley & Dorchester Counties, SC Surveyor-in-Charge of preliminary surveys for design of a 5-mile gas main, preparation of easement (17) plats, staking for construction and GPS data collection of pipe data during construction and preparation of and entry into GIS.

Poplar Grove Gas Main, S.C. Electric & Gas Company; Charleston County, SC. Surveyor-in-Charge of preliminary surveys for design of a 3-mile gas main, preparation of easement (13) plats, staking for construction and GPS data collection of pipe data during construction and preparation of and entry into GIS.

S.C Hwy. 170 Gas Main Relocation, S.C. Electric & Gas Company; Beaufort County, SC. Surveyor-in-Charge of GPS data collection of pipe data during construction and preparation of and entry into GIS.

SCE&G PeeDee 6-inch Gas Transmission Main Phase 1, Horry County, SC, Surveyor-in-Charge of preliminary surveys for design of a 3.5-mile gas main, preparation of easement (32) plats, staking for construction and GPS data collection of pipe data during construction and preparation of and entry into GIS.

McKewn Plantation Phase II Pump Station, Dorchester County, SC, Survey Manager for preliminary surveys for design of a new pump station with 6,800 feet of 10-inch diameter force main..

Cane Bay Pump Stations, Berkeley County, SC, Survey Manager for preliminary surveys for design of four pump stations and associated 42,900 linear feet of force mains and platting of twelve easements across private property..

Central Berkeley Wastewater Treatment Plant Flow Diversion West, Berkeley County, SC Survey Manager for preliminary surveys for design of proposed Pump Stations #111 and #112 including 40,000 linear feet of associated force mains.

KEN E. NAGEL, PE | PROJECT ENGINEER

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EDUCATION

BS, Civil Engineering, 1991, Georgia Institute of Technology

PROFESSIONAL REGISTRATIONS

Professional Engineer in SC, NC, GA, TX
Level II Erosion and Sedimentation Control
Certified
Certified Erosion and Prevention and
Sediment Control Inspector

PROFESSIONAL AFFILIATIONS

- APWA, Member
- ASCE, Member
- Society of American Military Engineers, Member

CORE COMPETENCIES

- Project Management
- Drainage Improvements
- Utility Infrastructure Relocations
- Utility Master Planning
- Roadway Improvements
- Bike & Pedestrian Improvements
- Water/Sewer Modeling
- Sanitary Sewer Evaluations
- Sanitary Sewer Rehabilitations
- Funding Assistance
- Public Outreach/Speaking

Ken is a Project Manager/Engineer who has over 26 years of experience designing and permitting a variety of road and drainage improvement projects primarily located in the coastal areas of South Carolina. These road and drainage improvement projects have included the design of storm drainage systems, grading and paving design for roads and pathways/sidewalks, and crosswalk designs. He has provided similar services to Charleston County since 2007.

PROJECT EXPERIENCE

2006 Folly Beach Drainage Improvements, Charleston County, Folly Beach, SC, Project Engineer for the completion of drainage improvements near the intersection of West Hudson Avenue with 3rd Street West on Folly Beach. The drainage issue consisted of low-lying areas along West Hudson Avenue, which didn't drain adequately, sometimes flooding West Hudson Avenue. Project consisted of installation of a piped system to convey stormwater from the intersection to an existing drainage canal. The scope included survey, conceptual design phase, preliminary and final design phase, utility relocation design and coordination, and permitting assistance with the Town of Folly Beach, SCDOT, and SCDHEC-OCRM.

October 2015 Flood, Public Assistance Support, Charleston County, SC, Project Engineer assisting Charleston County in recovery and mitigation work resulting from the devastating October 2015 flood event that dropped as much as 27 inches of rain in some parts of the County. To date, services have included drainage system damage assessments (three regional systems and five canals), road damage assessments (60 different roads), repair (permanent and mitigation) cost estimating, GIS data management and coordination, FEMA reimbursement documentation (including hazard mitigation funding applications) preparation of bid documents, procurement support, construction engineering and inspections, and project close-out.

Forest Acres Drainage Improvements, City of Charleston, SC, Project Engineer for the design of drainage improvements for the Forest Acres and 5th Ave Drainage Basins in the West Ashley area of the City of Charleston. The project includes conceptual, preliminary, and final design of the basin's main outfall system. The proposed improvements include over 2,500 linear feet of box culvert

improvements and 2,000 linear feet of channel improvements in the 450-acre watershed. Project responsibilities included coordination of survey and design activities; utility relocation design and coordination; permit coordination with the USACE, OCRM and SCDOT; public bid procurement, contract administration, and construction monitoring.

Transportation Sales Tax (TST) Drainage Improvements, Charleston County RoadWise, Various Locations, SC, Project Manager/Engineer for the completion of multiple road and drainage improvement projects including Folly Beach (4th Street West/West Ashley Ave, 3rd Street at East Huron Ave, 6th Street East, and 10th Street East), Isle of Palms (Lauden St/30th Ave, Sparrow Drive), Sullivan's Island (Stations 19 and 22), Johns Island (Legareville), McClellanville (Pinckney Street and North Alert Road), and six areas located within the Town of Lincolnville, SC. The scope of work consisted of providing design and permitting services including survey, preliminary and final design, utility relocation design and coordination, and permitting coordination with the Corps of Engineers, SCDOT, and SCDHEC-OCRM.

Morrison Street Drainage Improvements, Charleston County, McClellanville, SC, Project Engineer for the completion of drainage improvements near the intersection of Morrison Street (S-10-1191) with Baker Street in McClellanville, South Carolina. Project consisted of installation of a piped system to convey stormwater from the north side of Morrison Street to the south side, discharging to Jeremy Creek. The scope included survey, conceptual design, preliminary and final design, preparation of drainage easement plats, and permitting coordination with the Town of McClellanville, SCDOT, and SCDHEC-OCRM.

Parkers Ferry/South Santee Drainage Evaluations, Charleston County Public Works, Charleston County, SC, Project Engineer for evaluating various alternatives for alleviating flooding in two rural areas of Charleston County. For the South Santee Drainage Evaluation, we assisted the County in identifying, mapping, and prioritizing areas of the roadside drainage systems requiring maintenance for completion by the SCDOT. For Parkers Ferry, we assisted the County in identifying and resolving structural flooding issues resulting from an earthen access road located in adjacent wetlands. Tasks included coordination of wetland permitting associated with the installation of culvert cross drains, as well as coordination of land appraisal associated with acquisition of construction and maintenance easements.

BRIAN DURHAM, GISP | GIS MANAGER

682 Johnnie Dodds Blvd., Suite 100
Mt. Pleasant, SC 29464

durham.b@thomasandhutton.com

843-849-0200 Office
843-725-5275 Direct

EDUCATION

BS, Geography, 2007, Appalachian State University
MS, Energy Policy & Climate, 2019, Johns Hopkins University

PROFESSIONAL REGISTRATIONS

Geographic Information Systems Professional (GISP)

PROFESSIONAL AFFILIATIONS

American Society of Adaptation Professionals

American Association of Geographers

CORE COMPETENCIES

- GIS Web-Applications
- Mobile GIS
- ESRI® ArcGIS 10.x
- ESRI® 3D & Spatial Analyst
- ESRI® Collector
- Spatial Data Analysis
- Map Standards Creation and Implementation
- 3-Dimensional Modeling
- Data Acquisition
- Database Design
- Data Organization
- Image Processing
- Map Series Creation
- AutoCAD Civil 3D

Brian Durham has 11 years of professional GIS experience. He works with organizations to determine how data can be utilized to make smarter decisions and improve efficiency. Brian excels in geospatial analysis and management, serving clients in a wide variety of fields in both the public and private sectors.

PROFESSIONAL AWARDS

American Council of Engineering Companies of South Carolina Engineering Excellence Award - Isle of Palms Water & Sewer Commission GIS & Framework

PROJECT EXPERIENCE

Old Village Watershed Study – Phase 1, Town of Mt. Pleasant, SC, GIS Manager for a detailed study and improvement recommendations for the Old Village watershed. Responsible for designing a data collection workflow that would allow surveyed data to integrate seamlessly with existing Town of Mt. Pleasant GIS data. The project involved the collection and study of data including reports of flooding, service requests, FEMA flood claims, and construction permits. A capacity analysis was performed for the existing stormwater infrastructure, which was then assigned a level-of-service for existing and future runoff conditions. The basins/drainage systems were scored and prioritized to identify the most critical basins in need of improvements.

Charleston County Disaster Response, Charleston County, SC, Project involved studying approximately 300 roads needing repair after the October 2015 South Carolina flooding. All roads elevations were analyzed to locate sections below standard and determine scope of repairs. Reports were created for each road including station locations, Flood Hazard Zones, and construction strip exhibits. Data was added to geothinq, a GIS web application which allowed users access to all geographic aspects of each project and georeferenced photographs from site visits.

Isle of Palms Water and Sewer Commission (IOPWSC), Isle of Palms, SC, GIS Analyst for developing a GIS database and mobile application that serves as a centralized water/wastewater utility information system for the IOPWSC. The mobile application allows field personnel to view data in a live web application, collect field data, view and complete service & work orders in the field, and post

data to a SDE database. Front office personnel, operators, and managers are given the ability to work and communicate together seamlessly and in real time.

Berkeley County Water and Sanitation Department GIS, Berkeley County, SC GIS Manager for processing a backlog of dozens of water & sewer project as-builts for the County's Water and Sanitation Department. This backlog was leading bottlenecks in work and service order management. T&H met with the Department to understand their existing data schema and develop a process to convert CAD as-builts to GIS data. This data was delivered to the County for seamless integration with the County's existing utility data inventory, eliminating the backlog.

Stormwater Inventory, City of Augusta, GA, Designed stormwater geodatabase and mobile GIS for field data collection. As the collected field data was post-processed, the updated inventory was immediately viewable for interested parties in a real-time web-based GIS.

3-Dimensional Visualization/Land Use Planning, Johnnie Dodds Boulevard, Mount Pleasant, SC, GIS Analyst for creating 3-dimensional model of Johnnie Dodds Boulevard with hypothetical buildings to determine the visual impact of allowing an increase in building height along the corridor and to facilitate land use planning initiatives.

Murrells Inlet Water Quality Study, Murrells Inlet, SC, Assisted participating parties (Georgetown County, Horry County, Surfside Beach, Coastal Carolina University and MI 2020) with analysis of drainage areas and determining contributing areas for each water quality monitoring station being sampled by MI 2020. Work performed using techniques developed for analyzing GIS data with ArcGIS 9.3 Spatial Analyst Extension.

JENNIFER HAYES, PE, LEED AP, CPM | STRUCTURAL ENGINEER

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Mt. Pleasant, SC 29464

hayes.j@thomasandhutton.com

843.849.0200 Office
843.725.5292 Direct

EDUCATION

BS, Civil Engineering, 2000, Virginia Tech

PROFESSIONAL REGISTRATIONS

Professional Engineer in SC, NC, FL
LEED Accredited Professional
Certified Project Manager

CORE COMPETENCIES

- Project Management
- Structural Engineering
- Construction Management & Oversight
- Failure and Deficiency Analysis

Jen has 18 years of experience, including analysis, design, and construction management of federal, commercial, healthcare, municipal, educational, industrial, and residential structures. Her experience with existing structures includes failure and deficiency analysis, as well as historic structure analysis. Jen is a LEED Accredited Professional with detailed knowledge of sustainable design approaches, as well as energy conservation measures. She is also a Certified Project Manager.

PROJECT EXPERIENCE

Shem Creek Public Park, Mount Pleasant, SC, Thomas & Hutton performed design and construction oversight of phase 1 of this project in 2010 including at pile supported wooden boardwalk, public restroom facilities, fixed and floating dock systems and covered shade structures. Phase 2 was completed in June 2016 and included the planning, permitting, design and construction services for a new ADA accessible 1,200-linear foot concrete pile supported boardwalk along the edge of Shem Creek with a bridge, floating docks and pierheads. Phase 2 included extensive interaction and coordination with the restaurants and owners of the properties adjacent to the proposed boardwalk, as well as regulatory agencies. Phase 3 of the project to include a pedestrian crossing of the creek and development of a park, is currently underway.

Oyster Point Trip Wall, Mount Pleasant, SC, Structural Engineer for the design and construction services for a 3,000-foot long aluminum sheet pile trip wall. The

purpose of the trip wall is to trip the waves during flood events, in order to protect the inland structures from damages. Design includes soil considerations, flood and hydraulic calculations, scour considerations, and agency interaction with FEMA to produce LOMAR and CLOMAR.

Forest Trails Wastewater Treatment Plant Replacement, Isle of Palms Water & Sewer Authority, SC, Structural Engineer for the design and detailing of the concrete process structures and concrete/masonry building to support the replacement of the wastewater treatment plant. The process structures include an elevated concrete platform for the primary screen equipment and a divided concrete treatment basin with secondary screen support. The blower and operations building is a 2-story flood-proofed structure and is a combination of concrete and masonry. There is a monorail system supported by the building roof system for removal of the membranes. All main structures are pile supported.

Cainho Pump Station, Charleston, SC, Structural Engineer for the design and construction services for a new 2400-gpm pump station. Cast in place concrete structures included a 35-foot deep wet well and a 20-foot deep dry well. Also included was a partially enclosed steel building.

Waterfront and Marine Structures, Charleston, SC, Structural Engineer for various analyses/assessments, designs, and construction oversight for waterfront and marine structures in Charleston and surrounding areas. Structures include bulkheads/seawalls, revetments, and other erosion control systems, docks, pier heads, floating dock systems, and wharves. Ongoing.

Carolina Forest Boulevard, Myrtle Beach, SC, Structural engineer for the design of new two-lane concrete bridge with pedestrian walkway. Bridge is supported by concrete piles, cast in place concrete pile caps, cast in place concrete slab for deck.

Omni Industrial Park Culvert, Berkeley County, SC, Structural Engineer for the design and detailing of the bottomless culvert system to span wetland and creek below new roadway (AASHTO loading). A scour analysis was performed on the waterway, the results of which were used to design the walls and foundation. Various foundation systems were designed for consideration, including a pile-supported stem wall, concrete spread footings, and concrete footing system with soil improvements.

St. John's Yacht Harbor, City of Charleston Bridge, Charleston County, SC, Structural Engineer for various structural services for remedial action for severely deficient concrete bridge supported by timber piles. Performed a condition assessment and analysis with recommendations for immediate action. Completed a report detailing five different repair and replacement options, including preliminary design, cost estimates, schedule estimates, pros and cons for each option. Worked with contractors and permitting agencies.

**Previous experience with prior employer(s)*

BRYAN TAYLOR SHIVER, P.E.

DEPARTMENT MANAGER, GEOTECHNICAL SERVICES

OFFICE LOCATION: CHARLESTON, SC

PROFESSIONAL EXPERIENCE

Mr. Shiver is the Geotechnical Services Department Manager and a Senior Project Engineer in Terracon's Charleston, SC office. Over his 12 year career, Mr. Shiver has gained experience on various types of geotechnical assessments including water/wastewater investigations, residential, commercial, industrial, and transportation projects. Mr. Shiver has also been involved in environmental site assessments as well as construction oversight and quality control on many of his projects.

PROJECT EXPERIENCE

Water and Wastewater Projects

Managed several water and wastewater facility projects while becoming familiar with their unique foundation support requirements. These include below grade construction, buoyancy, and groundwater control. Additionally, investigated pump station and pipeline projects gaining expertise in their design and construction along with long term corrosion effects.

Notable projects:

- Cainhoy Plantation Pump Station, Charleston, SC
- Central Berkeley WWTP Pump Station, Moncks Corner, SC
- West Ashley Pump Station, Charleston, SC
- Dorchester Pump Station #67, Summerville, SC
- Ravenel Pump Stations 3 and 4, Ravenel, SC
- Santee Cooper Water Treatment Facility, Moncks Corner, SC
- Cherry Point Water Reclamation Facility, Jasper County, SC
- Lower Berkeley Wastewater Treatment Facility, Goose Creek, SC
- Upper Berkeley Wastewater Treatment Facility, Goose Creek, SC
- Charleston County Water and Sewer Pipeline Improvements, Charleston County, SC
- Mount Pleasant Water Systems Saddle Valve Corrosion Study, Mt Pleasant, SC

Education

M.S., Civil Engineering, Auburn University, 2007

B.S., Civil Engineering, Auburn University, 2002

Registrations

Professional Engineer: South Carolina: #27816

Awards

*ASCE South Carolina Section
Young Civil Engineer of the Year
2010-2011*

Affiliations

American Society of Civil Engineers

Charleston Civil Engineers Club

Earthquake Engineering Research Institute

National Society of Professional Engineers

Pile Driving Contractors Association

Work History

*2010-Present
Geotechnical Department Manager
Terracon, North Charleston, SC*

*2009-2010
Senior Staff Engineer
WPC, A Terracon Company
North Charleston, SC*

*2005 - 2009
Staff Geotechnical Professional
WPC, Inc., North Charleston, SC*

Research

DCP-CPT-DMT correlations in the Charleston, SC area

Liquefaction Remediation using Micro Particles

Embankment Settlements over Soft Soils Consolidation of High Plasticity Organic Clays (Pluff Mud)

Geotechnical Earthquake Engineering

Pile Soil Interaction

Will Salters, M.B.A., CFM

SENIOR SCIENTIST

PROFESSIONAL EXPERIENCE

Mr. Salters is a Senior Scientist with 16 years of professional experience with specific expertise in environmental planning, coastal policy, floodplain management, hazard mitigation planning, emergency management and regulatory permitting. Driven by opportunities to connect technical science with state and local policy, Mr. Salters has dedicated his career to promoting and protecting fragile coastal environments and has emerged as one of the most trusted, respected and well-connected leaders in his field throughout South Carolina and the southeast region.

PROJECT EXPERIENCE

South Carolina's Coastal Planner, CFM – Charleston, South Carolina

Program manager for South Carolina Department of Health and Environmental Control's (SCDHEC) Office of Ocean and Coastal Resource Management (OCRM). Fostered relationships, built capacity and provided direct technical assistance to state and municipal governments focusing on beachfront and estuarine shoreline management, floodplain management, coastal hazards, mitigation planning, resiliency planning and water quality improvement. Advanced the policy goals of South Carolina's Coastal Zone Management Program and developed and implemented 5-year programmatic strategies including enhancing FEMA's Community Ratings' System (CRS) in local beachfront communities in South Carolina. Mr. Salters is a proven leader of interdisciplinary teams demonstrating a unique ability to build partnerships, communicate, collaborate and work effectively with public and private stakeholders.

Previous Chair and South Carolina Liaison, Governor's South Atlantic Alliance's Disaster Resilient Communities Issue Area Technical Team- South Carolina/Southeast Region

Appointed by Governor Haley as South Carolina's Liaison on the Governor's South Atlantic Alliance's Disaster Resilient Communities Issue Area Technical Team. Charged with enhancing the understanding of ocean and weather dynamics and improving prediction, observation and forecasting capabilities for both episodic and chronic impacts from weather and climate change. Conducted regional and state-specific vulnerability assessments. Developed and implemented adaptation and mitigation strategies for climate change impacts. Improved post-disaster redevelopment planning for coastal communities.

Williamsburg Regional Hospital FEMA NEPA Environmental Assessment- South Carolina

Project Lead and Author for the preparation of an Environmental Assessment (EA) prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500 through 1508), and FEMA regulations for NEPA compliance (FEMA Management Directive 108-1). The purpose of the EA is secure federal funding for the development of the new hospital. FEMA must fully consider the environmental consequences of actions proposed for federal funding. The purpose of the EA is to meet FEMA's responsibilities under NEPA and to determine whether to prepare a Finding of No Significant Impact (FONSI) or a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for the proposed project.

PERMITTING AND REGULATORY EXPERIENCE

Mr. Salters has a diverse professional experience specializing in environmental consulting, OCRM regulatory compliance and review and National Environmental Policy Act (NEPA) site investigations, technical writing and site assessment. As a project manager, Mr. Salters has led numerous wetland delineations and permitting of critical and non-critical wetlands, regulatory interaction report preparation and interagency liaising.



EDUCATION

Master of Business Administration,
Environmental Policy and
Management, Florida Atlantic
University, 2004

Bachelor of Science, Environmental
Economics and Resource
Management, University of
Georgia, 2002

APPOINTMENTS

Founding Chair, Coastal South
Carolina's Community Ratings
System (CRS) Users Group

Advisory Committee, Charleston
County's Hazard Mitigation Plan

Previous Chair and SC Liaison,
Governor's South Atlantic
Alliance's Disaster Resilient
Communities Issue Area
Technical Team

REGISTRATIONS

Certified Floodplain Manager
Association of State Floodplain
Managers

PUBLICATIONS

Blue Ribbon Committee on Shoreline
Management's Final Report:
Recommendations for improved
beachfront management in South
Carolina, 2013

Adapting to Shoreline Change: A
Foundation for Improved
Management and Planning in
South Carolina, 2010

South Florida Environmental Report,
2006-2008

WORK HISTORY

Terracon Consultants, Inc., Senior
Scientist, 2018 to Present

South Carolina Department of Health
and Environmental Control's
OCRM, Coastal Planner, 2008-
2018

South Florida Water Management
District, Environmental
Analyst/Environmental Analyst II/
Project Manager, 2002-2008

Andy Ruocco, M.S., PWS, LEED AP BD+C

ENVIRONMENTAL DEPARTMENT MANAGER

PROFESSIONAL EXPERIENCE

Mr. Ruocco is an Environmental Department Manager with 17 years of professional experience. His education and environmental and regulatory compliance experience have resulted in the development of specialized multi-disciplinary skills for use on wetland disturbance, urban and water development, transportation and industrial development, and corridor assessment/restoration projects. His areas of expertise include project management involving Section 404/401 Clean Water Act permitting, Mitigation Analysis/Design, Development of complex Practicable Alternatives Analyses to support permitting for various large-scale industrial projects, transportation projects, utility rights-of-way, and commercial developments. Related areas of expertise include Threatened and Endangered Species Surveys, Habitat Assessments, NEPA Documentation, Environmental Site Assessments, Subsurface Site Investigations, Environmental Permitting and Regulatory Compliance, and Soil & Groundwater Remediation. Mr. Ruocco serves as an Authorized Project Reviewer (APR) for Natural Resource services and Phase I Environmental Site Assessments conducted as part of Terracon's quality control process.

PROJECT EXPERIENCE

Camp Hall Commerce Park – Berkeley County, South Carolina

Project manager for 404/401 CWA permit application, development of Permittee-responsible Mitigation Plan (PRM), Compensatory Mitigation for Losses of, Aquatic Resources; Final Rule, and preparation of environmental documentation. Calculated various mitigation scenarios for each alternative and lead the permitting documentation, which included preparation of a Practicable Alternative. The project involved coordination with regulatory agencies including USACE, SCDHEC, SHPO, EPA, SCDNR, USFWS, NOAA–NMFS and local government and community representatives, and environmental stakeholders. Other services conducted included a cultural resource survey, various wetland delineations, and protected species surveys.

Williamsburg Regional Hospital FEMA NEPA Environmental Assessment- South Carolina

Manager for the preparation of an EA prepared in accordance with NEPA, CEQ regulations, and FEMA regulations. The purpose of the EA is to secure federal funding for the development of the new hospital, meet FEMA's responsibilities under NEPA, and to determine whether to prepare a FONSI or NOI to prepare an EIS for the proposed project.

Grainger Generating Station Wetland Mitigation Bank Planning – South Carolina

Project manager for the planning and establishment of a mitigation bank to support a local energy provider and related economic development projects. Planning and preparation for the mitigation bank included mitigation calculations to determine potential mitigation credits available for sale, coordination with the Interagency Review Team (IRT), construction plans, hydrologic investigations, wetland and WoUS delineations, monitoring, conservation easement evaluation, long-term stewardship evaluation and coordination, and preparation of a mitigation banking prospectus.

South Carolina Inland Port Dillon – Dillon County, South Carolina

Project manager working directly for the South Carolina Ports Authority (SCPA) providing Individual 404/401 CWA wetland permitting and development of a PRM to offset the wetlands and WoUS impacts associated with the development of the South Carolina Inland Port Dillon. The permitting support included preparation of permit drawings to meet USACE submittal standards and calculation of mitigation credits requirements using the USACE Charleston District's Compensatory Mitigation Guidelines. Developed a PRM plan that consisted of preservation and hydrologic enhancement of an approximately 75-acre property located within the floodplain of the Little Pee Dee River to offset the impacts associated with the SCIPD project. The project involved coordination with regulatory agencies including USACE, SC SCDHEC, and SCDNR.



EDUCATION

Master of Science, Environmental Science, College of Charleston, 2007

Bachelor of Science, Biological Sciences, University of South Carolina, College of Science and Mathematics, 2000

REGISTRATIONS

Professional Wetland Scientist
Society of Wetland Scientists

LEED Accredited Professional

Licensed Asbestos Building Inspector
/ SC

Licensed Well Driller / SC

Certified Erosion Prevention
Sediment Control Inspector

CERTIFICATIONS

40 Hour HAZWOPER Certification

10 Hour OSHA Construction
Certification

30 Hour OSHA Construction
Certification

NEPA and Transportation Decision
Making Process provided by
National Highway Institute, 2013

NEPA Cumulative Effects Analysis
and Documentation provided by
the Shipley Group, 2012

WORK HISTORY

Terracon Consultants, Inc., Staff
Scientist / Project Manager /
Environmental Manager, 2005 to
Present

South Carolina Department of Health
and Environmental Control,
Environmental Manager I, 2001-
2005

EDWARD J. FERNANDEZ, CFM

Senior Management Consultant / Urban Planner



An urban planner with a focus on helping communities withstand, respond, and adapt to the impacts of natural hazards. Supports clients to fund initiatives to improve their natural hazard resilience.

EDUCATION

MSP Urban & Regional Planning,
Florida State University 2011
BS Political Science, Florida State
University 2007
BS Social Sciences, Florida State
University 2007
Certificate in Urban Design, Florida
State University 2011

YEARS OF EXPERIENCE

Total – 9

With ARCADIS – 8

PROFESSIONAL REGISTRATIONS

Certified Floodplain Manager – FL
Certified Project Manager - Arcadis

PROFESSIONAL ASSOCIATIONS

Association of State Floodplain
Managers
American Planning Association
Natural Hazards Mitigation
Association
State of Florida, State Hazard
Mitigation Advisory Team

PUBLICATIONS AND PRESENTATIONS

Hazard Mitigation For Utilities:
Forming Partnerships For
Leveraging Resources And
Funding Opportunities WSC – St.
Louis, MO; September 2012
Implementing Hazard Mitigation for
Water and Wastewater Utilities –
FEMA EMI - FEMA 2018 Hazard
Mitigation Stakeholders Workshop

PROFESSIONAL TRAINING

FEMA L212, Unified Hazard
Mitigation Assistance –
Developing Quality Application
Elements
FEMA L213, United Hazard
Mitigation Assistance – Application
Review and Evaluation
FEMA L-276 and G-278, Benefit-
Cost Analysis (Advanced)
National Incident Management
System (NIMS) 100b, 200b, and
700(a)
FEMA Hazus Loss Estimation

Edward J. Fernandez specializes in disaster planning, floodplain management, funding, and grants management. Mr. Fernandez provides ongoing support to several state, local, and non-profit organizations with grant application development and management. Mr. Fernandez has extensive experience developing Hazard Mitigation Assistance (HMGP/PDM/FMA) applications and 406 Hazard Mitigation Proposals, with a specialization in benefit-cost analysis. He has also developed methods for post-disaster loss avoidance assessment, in order to analyze return on investment for flood and wind hazard mitigation projects.

Project Experience

Main Road Drainage Improvement – Charleston County, SC

Project lead for the development of a Hazard Mitigation Grant Program (HMGP) application under DR-4241 for a roadway elevation project for Main Road in Charleston County. Worked with the project team to submit complete and a competitive grant application to the South Carolina Emergency Management Division (SCEMD) which was successful in obtaining funding from FEMA.

Wastewater Infrastructure Relocation and Floodproofing – Isle of Palms Water and Sewer Commission

Project lead for the development of a HMGP application under DR-4241 for the relocation, floodproofing, and consolidation of service of the Wild Dunes and Forest Trails WWTP. Worked with the project team to submit complete and a competitive grant application to the South Carolina Emergency Management Division (SCEMD) which was successful in obtaining in funding from FEMA.

Multi-Basin Stormwater Drainage Improvement Project – Sullivan's Island, SC

Project lead for the development of a HMGP application under DR-4241 for stormwater improvements for Station 18/Atlantic Ave Basins and Marshall Boulevard/Brownell Avenue Basins. Worked with the project team to submit complete and a competitive grant application to the South Carolina Emergency Management Division (SCEMD) which was successful in obtaining funding from FEMA

National Disaster Resilience Competition - City of Norfolk, Virginia

\$120M Winning National Disaster Resilience Competition Application. Supported the City of Norfolk in developing environmental, social, and economic development solutions that support adaptation to sea level rise and prevent repetitive loss in low to moderate income areas of the community. Conducted a Benefit Cost Analysis to quantify social, environmental, economic, and resiliency benefits to justify public expenditure.





SUB-CONSULTANTS

Thomas & Hutton continues to foster great working relationships with teaming partners throughout the Southeast. Our sub-consultants for this project are below. We have worked extensively in the past with both sub-consultants on similar types of projects.



Since 1965, Terracon has evolved into a successful multi-discipline firm specializing in environmental, facilities, geotechnical, and materials. Terracon has experience with wetland permitting issues and geotechnical evaluations of geologic and groundwater conditions relevant to the design and construction of drainage improvement alternatives. The firm has a reputation for providing a timely response, coupled with clear and concise consultation, which reduces project delays.

Terracon's Charleston office has a team of geotechnical engineers who are intimately familiar with the unique soil conditions on the South Carolina coast. These soil conditions generally contain soft alluvial clays, loose sands, and high groundwater. These conditions are further complicated with high seismicity. Excessive settlements, liquefaction, weak subgrade, and site preparation difficulties are common in this region. Failure to accurately address these issues during the design phase may lead to extensive construction delays and significant costs. With a local geotechnical presence, Terracon has excellent understanding of the properties of these soils because of their many years of experience working in this challenging environment. Terracon has performed wetlands delineation and permitting on various properties. Working together, Terracon and Thomas & Hutton were able to produce a permit application for an individual permit that was authorized by the USACE and the State of South Carolina within four months following submittal of the permit application (typically a one-year process). The heavy industrial site project involved substantial coordination with regulatory agencies including USACE, SCDHEC, and SCDNR.

Terracon will be responsible for geotechnical engineering services, wetlands/critical areas science services, and permitting assistance/grant funding advising services.



Arcadis is a global natural and built asset design and consultancy firm that provides services in infrastructure, water, environment and buildings. They deliver services throughout the entire value chain – from strategic advice, project management, planning, design and implementation, to maintenance and total lifecycle operation. Their reputation is built on a deep understanding of client needs, combined with their knowledge and experience. With over 27,000 people, Arcadis has built an international network that enables us to serve their local clients on a global basis. Some of the strongest services that Arcadis provides is pursuit of funding, grant management, and audit support. Their funding team being presented to the City of Isle of Palms evaluates, prepares and submits project applications for grants and low interest loans. They have demonstrated success in obtaining over \$4 billion in funding over the past five years for their clients. Arcadis is committed to help cities to navigate towards a more resilient future through supporting the transition from their resilience strategy to funding and implementation.

Arcadis will be responsible for grant funding advising services.

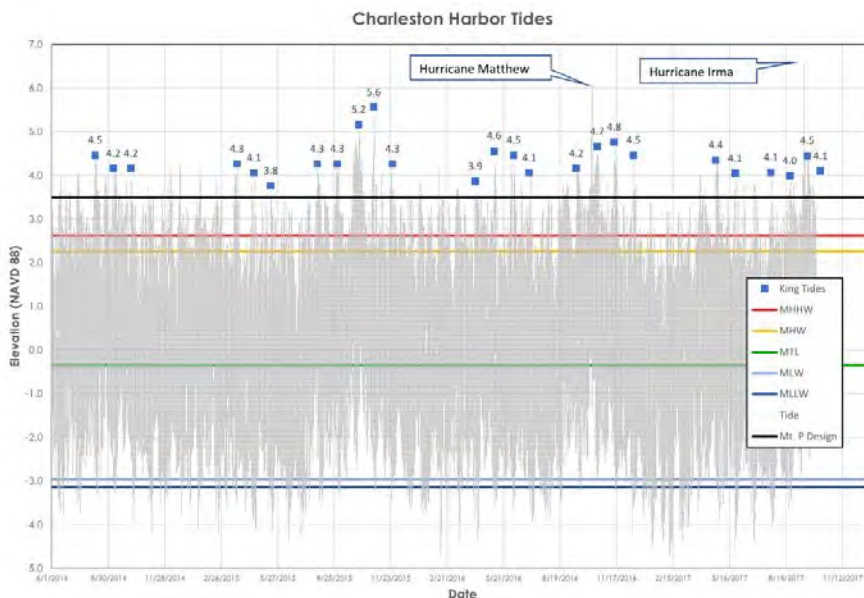




PROJECT UNDERSTANDING

The City of Isle of Palms (the City), like many South Carolina coastal municipalities, is experiencing increased occurrences of flooding due to heavy rainfall events, extreme high tides, sea level rise, high-water table conditions, and more intense coastal storms. These conditions, combined with an inadequate drainage system, have created flooding conditions throughout the City. In addition, new development and redevelopment throughout the island community can result in higher amounts of impervious surfaces (rooftops, driveways, parking areas, etc.) resulting in increased stormwater runoff volume – which only makes the flooding conditions worse. All these contributing factors will continue to worsen over time and cause additional flooding if not addressed.

In addition to these physical and environmental issues, the City is faced with identifying viable funding for delayed maintenance and improvements to the drainage system. The existing drainage system outside of Wild Dunes resort is principally owned and “maintained” by the South Carolina Department of Transportation (SCDOT). The SCDOT has traditionally provided minimal maintenance of the system, but has been reluctant to make improvements. Most past improvements have been completed under contracts administered by Charleston County as funds were available. These projects, though helpful, generally only address a specific location or condition and do not address the larger neighborhood or island-wide issues. Other potential funding sources (particularly many state and federal grant programs) require potential applicants to provide a detailed study of flooding conditions and detailed designs of projects in order to be competitive for receiving grant funding.



To begin addressing flooding in three of the City’s drainage basins, the City is soliciting proposals from qualified consulting firms to study and design improvements to the outfalls of the basins. The three basins/outfalls include 30th Avenue, Forest Trails, and 41st Avenue

Please see the attached **Project Area Map** and **Outfall Map** included at the end of this section for the limits of the project.

We understand that the City is seeking the services of a qualified professional engineering firm to design and oversee improvements to the three identified outfalls to include surveying, designing, permitting through all applicable agencies, developing bidding package, and overseeing construction. We further understand that the City’s goals for this project are to:

- Identify the appropriate area where the back of the island should be sealed from the intrusion of tidal waters from backing into the system
- Design and permit drainage outfall systems that will seal the tidal water out, while allowing stormwater to exit
- Design and size appropriately to provide for future drainage improvements within the basins associated with each of the three outfalls
- Design to anticipate a reasonable expectation of sea level rise, an increase in impervious surfacing on the island, and soil saturation before storms
- Design to a level that would have kept flood waters associated with Hurricane Joaquin from damaging houses



Thomas & Hutton is well suited to conduct the requested services and provide the City with the necessary consulting to complete the projects. With some minor sub-consultant support (in which we have worked with successfully on similar projects), we believe our team is best qualified to assist the City in achieving their goals for this project. We understand that there will need to be multiple tasks completed for this project, including data collection, basin studies, alternatives evaluation, improvement recommendations, engineering design, plan production, permitting assistance, cost estimating, grant funding assistance, project phase planning, project scheduling, and possibly additional services, including bid phase and construction phase services. Our local Thomas & Hutton team members and highly qualified sub-consultants can address all these tasks efficiently and cost-effectively.

Drainage infrastructure within the study area generally includes some closed storm drain systems (generally of small diameter, i.e. 12- to 18-inch diameter pipes), roadside swales and driveway pipes, and ditches. The study area for this project includes those areas draining to the three outfalls. All of the outfalls are tidally influenced from the Intracoastal Waterway (ICWW). Thomas & Hutton has mapped the existing drainage systems (based on available data and topography) and developed preliminary basin maps (see the **Project Area Map** at the end of this section).

PROJECT APPROACH

The City's Phase 3 Drainage Outfall Design and Permitting project will consist of the necessary services needed to accomplish the City's goals for the project. Our proposed project approach is structured around the scope of services outlined in the Request for Proposals and has been extensively tailored based on our past experience and professional judgment. We understand that this study is a collaboration with the City (and other stakeholders) and we can modify our approach quickly, as necessary, to meet the needs and requirements of all involved. Our team can adapt quickly to unexpected conditions and keep the study on track to meet its goals and schedule.

Our proposed approach includes the following tasks:

- Existing Data Collection and Analysis (City Scope of Work Item 1)
- Survey (City Scope of Work Item 2)
- Study, Alternatives Analysis, and Recommended Outfall Improvements (City Scope of Work Items 3 and 4)
- Engineering Design and Plans Preparation (City Scope of Work Item 5)
- Permitting (City Scope of Work Item 6)
- Opinion of Probable Construction Cost (City Scope of Work Item 7)
- Funding Assistance (City Scope of Work Item 8)
- Project Phasing Plan (City Scope of Work Item 9)
- Project Schedule Development (City Scope of Work Item 10)
- Project Administration and Meetings (City Scope of Work Item 11)
- Bid Phase Services (City Scope Alternate #1)
- Construction Phase Services (City Scope Alternate #1)

To allow the City to assess our proposed approach and qualifications, we have depicted major tasks and sub-tasks, provided an explanation or description of some of the proposed tasks, as well as additional information as to the exact procedures, techniques, and software that we propose to use. We are confident in our ability to provide the City with quality analyses, findings, and deliverables in a timely and efficient manner.

Existing Data Collection and Analysis (City Scope of Work Item 1)

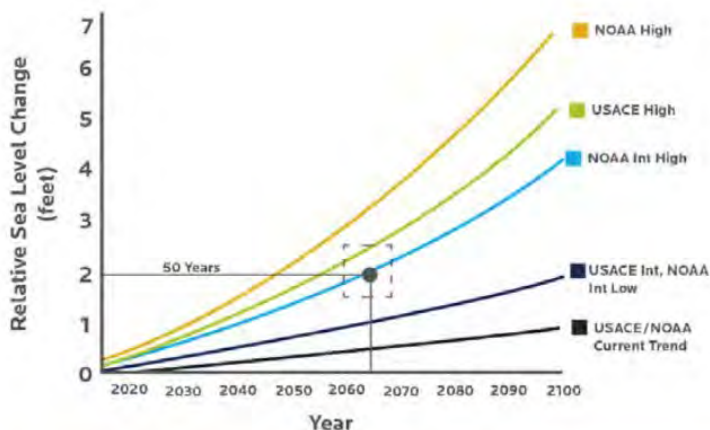
Thomas & Hutton will maximize the use of available data through a comprehensive review and compilation of existing records and information sources, including, but not limited to, City-provided data, documents and photos of flooded areas, drainage service requests and citizen complaints history, Geographic Information System (GIS) mapping data, existing stormwater system inventory (already acquired from Charleston County), previously conducted hydrologic and



hydraulic (H&H) studies, available aerial photographs, plans/computations for constructed projects, literature, FEMA claims records, and others.

Thomas & Hutton will collect additional data, including useful GIS data for the study area, but will most often rely on our extensive and current in-house library of GIS data, as most of it is currently housed in our customized geothinQ tool. This includes, but is not limited to, FEMA flood data, soils, topography (digital elevation model and contours), aerial photography, roads, utilities, building footprints, wetlands, past hurricane imagery, sea level rise projections, and maximum storm surge potential.

We do know that LiDAR topographic data was recently (2017) collected for Charleston County by SCDNR. This data has not been publicly released yet, but we believe the data could be useful in the study of drainage conditions for the three outfalls. We will attempt to collect this data from Charleston County or SCDNR. In addition, the water and sewer utilities in and around the project area may be impacted by the outfall improvement projects (or future projects in the contributing basins). The IOP Water and Sewer Commission (IOPWSC) does have a GIS mapping data for its infrastructure that can be used as part of this project.



Planning parameters for 50-year outlook, based on sea level change projections by U.S. Army Corps of Engineers and NOAA (Charleston, SC).

Survey and Wetlands/Critical Area Delineations (City Scope of Work Item 2)

Thomas & Hutton will provide the necessary field surveys for the proposed project improvements. All survey work will be supervised by a South Carolina Professional Land Surveyor (PLS). Thomas & Hutton will conduct field, topographic, and boundary surveys of the selected improvements corridor(s). The field survey will include the information necessary for the final design of the project including:

- Pipes – inverts, size and type of drainage pipes, and driveway culverts
- Ditches – top and bottom of slope plus centerline inverts
- Above-ground features – fixed features within the project area, including power poles, guy wires, hydrants, monument sign(s), mailboxes, fences, trees, etc.
- Underground utilities (SUE Quality Level B)
- Roads – survey edge of pavement and centerline. If curb exists within project limits, include back of curb elevation and type.

Thomas & Hutton will perform a topographical survey of the project that is suitable to produce one-foot contours. The boundary survey will include courthouse research on properties likely impacted by the project and field surveys of all existing property evidence and monuments along project frontage.

Thomas & Hutton's wetland scientist sub-consultant, Terracon, will delineate the waters of the United States within the project area in general accordance with the regulatory requirements of 33 CFR Part 328 *Definition of Waters of the U.S.*, the *Corps of Engineers Wetland Delineation Manual*; January 1987. The delineations will be flagged in the field and a field sketch approximating the limits of the delineation will be prepared for future surveying. There are saltwater critical areas contained on or adjacent to proposed improvements and will need to go through SCDHEC-OCRM review also.

Terracon will prepare and submit a USACE Jurisdictional Determination Request and SCDHEC-OCRM critical area determination and will coordinate with the agencies in order to obtain written verification of the limits of jurisdiction. If a field inspection of the delineation is requested, the sub-consultant will accompany agency personnel to the subject property to support the delineation. The wetland and critical areas delineated and verified by the appropriate agency will be surveyed and included in the overall project survey.

Thomas & Hutton will coordinate with the City by providing the TMS and property information for affected or adjacent properties. Thomas & Hutton will also coordinate with the City to communicate with property owners. This may take the form of project letters informing the owner that surveyors maybe accessing their property. Once project letters have been



sent to the community by the City, survey activities will commence. Survey personnel will carry a copy of the letter at all times.

Study, Alternatives Analysis, and Recommended Outfall Improvements (City Scope of Work Items 3 and 4)

Thomas & Hutton will conduct a limited drainage study of the three drainage outfall basins – 30th Avenue, Forest Trails, and 43rd Avenue. The study will not be an in-depth study of the basins and will not identify all the internal drainage infrastructure improvements necessary for the systems to function to the level of service (LOS) listed in the City's RFP. The study will, however, anticipate that all the internal drainage infrastructure in the basins will be improved in the future (to the City's LOS goal) and that proposed outfalls improvements will be sufficient to accept the future runoff and meet the City LOS goal at the outfall and throughout the basins.

A site reconnaissance will be conducted to confirm existing infrastructure (drainage inlets, manholes, pipes, etc.), basins and sub-basin delineations, and gather other field data. The basin, sub-basins and drainage mapping will be adjusted as needed based on the findings of the site reconnaissance.

It is anticipated that limited H&H modeling will be conducted for each basin as part of this study. This modeling will include the assessment of various design events (i.e. 10-, 100-, and 500-year) and recorded rainfall events (Hurricane Joaquin). The study will also assess various future sea level rise scenarios and the potential impact on the function of the future drainage system.

The study will be conducted to anticipate an increase in impervious areas within the basins due to redevelopment. Thomas & Hutton has recently conducted an assessment of impervious area increases due to residential redevelopment for the Town of Mount Pleasant associated with the Old Village Drainage Improvements project. A similar methodology will be used for Isle of Palms.

The study will be conducted to anticipate a high level of soil saturation prior to rainfall events (thus more stormwater runoff can be expected). Also, various methods of tide backflow protection (i.e. in-line check valve, flap gates, muted tide gates, etc.) will be investigated as part of the study.

During the study, Thomas & Hutton will investigate various alternatives for the design of the three basins outfalls. These alternatives will be a combination of closed and open drainage systems with a tide control system. Given the constraints of the project sites and using our engineering judgment, several alternative outfall layouts will be developed for presentation to the City. The anticipated functions and resulting LOS in the basins of each alternative design will be documented and discussed with the City. Conceptual opinions of probable construction costs will also be developed for the alternatives.

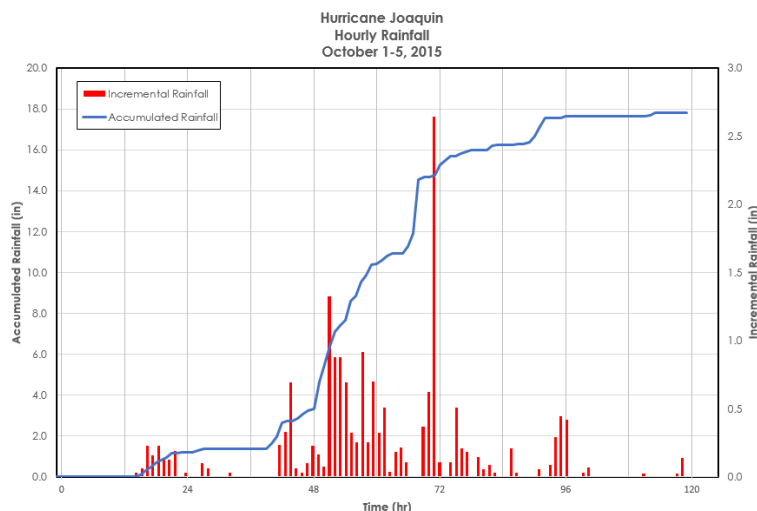
Given the complexities, anticipated future costs, and specialized additional services needed to design stormwater pumping systems, stormwater pumping will not be considered as an alternative nor as the subject of our proposed design services. We believe the level of stormwater management and flood control needed to meet the City's goal LOS could not be cost-effectively implemented by stormwater pumping. If during this study phase and in consultation with the City, stormwater pumping is determined as the only viable option, additional services will be required to implement and design the option.

Working with the City in reviewing the outfall design alternatives, Thomas & Hutton will narrow the outfall design to the recommended improvement at each outfall.

Engineering Design and Plans Preparation (City Scope of Work Item 5)

Preliminary Design: Thomas & Hutton will be ready to begin the preliminary design of the project immediately after the recommended improvements are approved by the City. The preliminary design will be equivalent to a 30-percent design of the proposed improvements. We will develop the necessary plans including the following: cover, notes, plan and profiles, sections (limited design information), property strip map, etc.

All project improvements will be quantified and a preliminary opinion of probable construction cost will be developed. At this initial phase of the project, Thomas & Hutton will review the preliminary design and costs with the City and adjust the





REQUEST FOR PROPOSALS 2018-02 FOR PHASE 3
DRAINAGE OUTFALL DESIGN AND PERMITTING
ISLE OF PALMS, SC

project as needed. Thomas & Hutton, in coordination with the City (and other stakeholders), will conduct a field design review of the preliminary plans. This will identify potential construction or other issues that can address early to avoid costly redesign and field adjustments in the future.

Geotechnical Evaluation: Based on the preliminary engineering design, Terracon, our geotechnical sub-consultant, will perform subsurface soil explorations at selected locations at the three projects sites to ascertain soil characteristics. The exact number and type of testing may be determined by the type of improvements being designed. The following section describes the anticipated geotechnical investigations and testing, but may be subject to change as the preliminary design is developed.

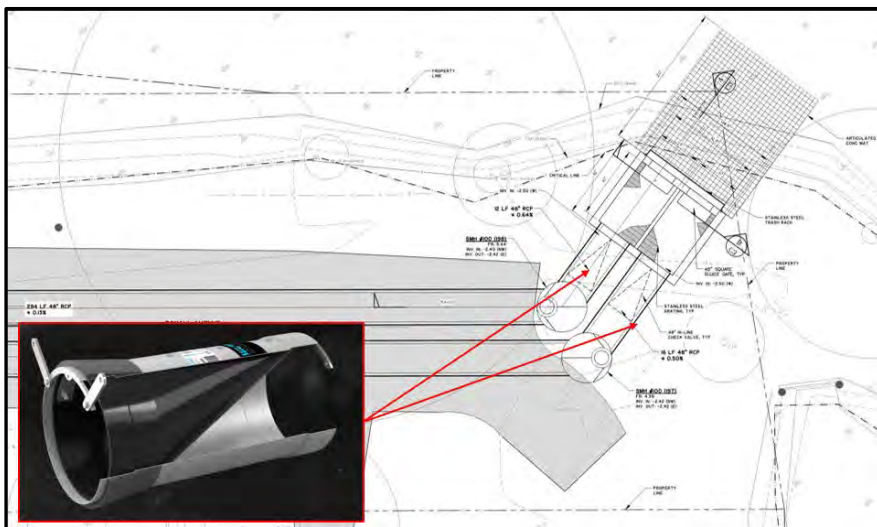
Field and subsurface explorations will be performed which will consist of two Cone Penetration Tests (CPT) at each of the 30th Avenue and Forest Trails outfalls and three CPTs at the 41st Avenue outfall, for a total of seven CPTs. In addition, seven Hand Auger Borings (HAB) will be performed adjacent to each CPT. Testing will also include in situ soundings and observations of ground water. Field data will be processed by the geotechnical engineer to create the final in situ sounding and hand auger boring logs.

The geotechnical engineer will develop a geotechnical site characterization, perform the engineering calculations necessary to evaluate foundation alternatives, and develop appropriate geotechnical engineering design criteria. When services are complete, a final geotechnical engineering report will be provided. The final report will include test logs, soil stratification and a description of subsurface conditions, groundwater observations, estimated settlement, recommended foundation and design parameters, seismic classification and summary of hazards, and subgrade preparation/earthwork recommendations.

Final Design: Upon completion and acceptance of the preliminary design by the City and completion of the geotechnical investigations, Thomas & Hutton will continue into final design of the proposed improvements.

The construction plans will be advanced and additional information generated. A project phasing plan will be developed (see *Project Phasing Plan* section below) and appropriate design coordinated between the phases. Additional plan sheets will also be developed, including details, stormwater pollution prevention plan (SWPPP), utility relocation, traffic control, etc.

Generally, SCDOT standard specifications will be used, including the use of SCDOT pay item list and quantities while preparing cost estimates. The design will be based upon current SCDOT design manuals. Construction plan review milestone will be made at 60-percent and 100-percent.



Permitting (City Scope of Work Item 6)

Thomas & Hutton will assist the City in obtaining necessary permits, certifications, and approvals required by agencies having jurisdiction over the drainage improvement project. Permit packages will be prepared for, and submittals made to, the required agencies for review and issuance of permits. It is anticipated that the following permits will be required:

- City of IOP MS4 Approval (administered by Charleston County)
- SCDHEC-OCRM – Coastal Zone Consistency Certification
- SCDHEC BOW – NPDES NOI Construction General Permit
- SCDOT Encroachment Permit
- USACE/OCRM Wetland/Critical Area Impact Permit
- Miscellaneous Encroachment Permits/Approvals

Thomas & Hutton will coordinate with these agencies for the review and approval of the proposed drainage improvements. We will actively track the review of the permit applications and provide responses to comments and address requests for additional information until the permits are issued.



Thomas & Hutton, and our wetland/critical area sub-consultant (Terracon) will strive to limit the impacts to wetlands and critical areas and work as an advocate for the City to limit the need for mitigation (including negotiations with the USACE and OCRM). Dependent on the potential impacts to wetland and critical areas, wetland or critical area mitigation may be necessary. This scope of services includes coordination of purchasing mitigation credits (if available), but does not include provisions for on-site mitigation. Mitigation credit purchase fees will be provided by the City.

Opinions of Probable Construction Costs (City Scope of Work Item 7)

Thomas & Hutton will provide the City (and other stakeholders) opinions of probable construction costs at various stages of the project. The opinions will be based on the level of detail of design at the time the opinion is generated. The stages include study (conceptual alternatives), preliminary (30-percent) design, pre-final (60-percent) design, and final design (100-percent). It is anticipated that the opinions' accuracy will increase as the design of the proposed improvements progresses. Up to three conceptual opinions of probable construction costs will be generated during the study phase. Unit cost for common construction items will be developed from recent construction projects in the area. More unique items will be researched, and if possible, vendors/construction companies will be consulted for pricing. In general, common SCDOT line items will be used for estimating purposes.

Funding Assistance (City Scope of Work Item 8)

Assistance will be provided to the City to determine and coordinate a funding strategy for the project. This task may include the determination of probable funding sources, including grant sources, participation in meetings and calls on an as-needed basis, and development of basic information in support of grant applications. These services do not include the preparation of grant applications or other detailed supporting documentation. As listed in the City's RFP, these services may be provided as additional service once the funding source has been identified. As the effort associated with this task is unknown, these services will be provided on a time and expense (T&E) basis.

Project Phasing Plan (City Scope of Work Item 9)

Thomas & Hutton will work with the City to develop a project phasing plan for the proposed improvements. The plan will be based on various constraints and input, including prioritizing a small portion of the proposed improvements that can be implemented in the short-term to provide flood relief, current and future funding, seasonal access considerations, and others. The phasing plan will be incorporated in the construction plans (see *Engineering Design and Plans Preparation* section above) as necessary.

Project Schedule Development (City Scope of Work Item 10) Thomas & Hutton will create and update the project's schedule throughout the design and permitting of the project (see *Project Administration and Meetings* section below). The schedule will generally be updated monthly as the project progresses. At various times during the project design and permitting, the timing and duration of construction for the proposed improvements will be evaluated. The project's construction schedule will be evaluated at the end of the study, after preliminary design (30-percent) and after pre-final (60-percent) and final (100-percent) design. Project phasing (if any) will be incorporated in the project schedule at the pre-final and final design stages.



Project Administration and Meetings (City Scope of

Work Item 11) Thomas & Hutton will provide the needed project organization, management, scoping with the project's stakeholders, including the City, SCDOT, IOPWSC, Wild Dunes Golf Course, and other affected property owners. The Thomas & Hutton team will conduct resource agency coordination and project partnering and attend agency and public involvement meetings (if needed).

We will provide budget, schedule, and expenditure updates on a monthly basis (in coordination with the projects invoicing) and meet with the City to review if required. We will attend regularly scheduled project progress meetings with the City, as well as meeting to address unknown/unusual issues. A project kick-off meeting will be held with City staff (and other stakeholders, if appropriate) that will include a review of the project scope, goals, deliverables, and schedule. Also, per the City's RFP, we will make presentations to the City's boards on at least three occasions.



From previous experiences, we understand that early, frequent, and consistent coordination and communication to the project's stakeholders (SCDOT, IOPWSC, affected property owners, etc.) is vital to the success of any project, especially drainage improvement retrofit projects. We have budgeted an appropriate amount of time to assist the City in coordination and conducting this outreach.

Bid Phase Services (City Scope Alternate #1)

Assistance will be provided to the City during the bid process with the following:

- Prepare bid package and invitation to bid
- Coordinate and attend a pre-bid conference
- Issue clarification requests or bid addendums, if necessary
- Attend bid opening
- Receive construction bids
- Prepare a bid abstract
- Evaluate the bids
- Prepare consultant's recommendation for award

It is anticipated that City or Thomas & Hutton "front-end" documents will be used. Technical specifications for standard SCDOT items will not be provided, however, specifications for non-standard items will be provided.

This scope includes the administration of one bid procurement occurrence. If subsequent bid procurement occurrences are requested by the City, bid administration services for these subsequent occurrences will be considered additional services.

Construction Phase Services (City Scope Alternate #2)

Office and field-related services shall be provided during construction. It is anticipated by this scope of service that construction will take place over a continuous 9-month period. The following office-related construction phase services will be provided.

- *General Administration of Construction Contract* - Consult with City and act as City's representative
- *Pre-Construction Conference* - Participate in a Pre-Construction Conference prior to the commencement of work at the site
- *Defective Work* - Recommend to City that Contractor's work be disapproved and rejected while it is in progress if, based on such observations, Consultant believes that such work will not produce a completed project that conforms generally to the Contract Documents
- *Clarifications and Interpretations; Field Orders* - Issue necessary clarifications and interpretations of the Contract Documents as appropriate to the orderly completion of Contractor's work. Such clarifications and interpretations will be consistent with the intent of and reasonably inferable from the Contract Documents. The Consultant may issue field orders authorizing minor variations from the requirements of the Contract Documents.
- *Change Orders and Work Change Directives* - Recommend change orders and work change directives to City, as appropriate, and prepare change orders and work change directives as required.
- *Business/Residential Coordination* - Assist the City in coordinating with the affected businesses and residents along the project
- *Utility and SCDOT* - Assist the City with coordinating with the SCDOT and utilities
- *Shop Drawings and Samples* - Review, approve, or take other appropriate action in respect to shop drawings and samples and other data which Contractor is required to submit





REQUEST FOR PROPOSALS 2018-02 FOR PHASE 3
DRAINAGE OUTFALL DESIGN AND PERMITTING
ISLE OF PALMS, SC

- *Substitutes and "or-equal"* - Evaluate and determine the acceptability of substitute or "or-equal" materials and equipment proposed by Contractor
- *Inspections and Tests* - Require such special inspections or tests of Contractor's work as deemed reasonably necessary and required by the specifications, and receive and review all certificates of inspections, tests, and approvals required
- *Project Schedule* - Review and approve or take other appropriate action in respect to the Contractor's project schedule and project schedule changes
- *Photo and Video Gallery* - Maintain photo and/or video documentation of the project and the project's construction progress. A compiled photo/video gallery will be provided to the City at project close-out.
- *Observation Reports* - Maintain a log of observation reports. Provide a weekly summary progress report to the City.
- *Disagreements between City and Contractor* - Render formal written decisions on all claims of the City and Contractor relating to the acceptability of Contractor's work or the interpretation of the requirements of the Contract Documents pertaining to the execution and progress of Contractor's work
- *Applications for Payment* - Review Applications for Payment and accompanying supportive documentation and determine the amounts that Consultant recommends Contractor be paid
- *Contractor's Completion Documents* - Receive and review maintenance and operating instructions, schedules, and guarantees. Receive bonds, certificates, or other evidence of insurance not previously submitted, certificates of inspection, tests and approvals, Shop Drawings, Samples and other data.
- *Substantial Completion* - Promptly after notice from Contractor that Contractor considers the entire Work ready for its intended use, in company with City and Contractor, conduct an inspection to determine if the Work is Substantially Complete
- *Final Notice of Acceptability of the Work* - Conduct a final inspection to determine if the completed Work of Contractor is acceptable so that Consultant may recommend, in writing, final payment to Contractor

The Consultant shall make visits to the Site at intervals appropriate to the various stages of construction in order to observe the progress and quality of the Work. This scope of services does not include confirmatory testing during construction. If requested by the City, Thomas & Hutton will coordinate with a third-party confirmatory testing firm for the project. The firm shall contract directly with the City.

A final inspection with the Contractor and City personnel will be conducted. A punch list will be prepared and provided to the Contractor to address. Follow up inspections will be conducted as necessary. Assistance will be provided to the City for the preparation of documentation for permit terminations and grant close-out. A 1-year warranty inspection will be conducted and a punch list will be prepared and provided to the Contractor to address. Follow up inspections will be conducted as necessary.



Job Number	Produced: 08/30/18	Produced By: REA	Modified: 8/30/2018	Modified By:
File: W:\MARKETING\SUBMITTALS\2018\City of Isle of Palms 3 Outfalls\GIS\Map\BasinMap.mxd			Vertical Datum:	
Thomas & Hutton compiled the map information from the following sources:				
Data	Source	Date		
Basin/Outfall	T&H	2018		
Inlet/Manhole/Pipe/Channel	Charleston County	2015		
Building Footprints	Charleston County	2007		
Contours	Charleston County	2009		
Parcels	Charleston County	2015		
DISCLAIMER				
Where Thomas & Hutton is cited as the data source, the firm has created or verified the data. For all other sources cited, Thomas & Hutton used the data "as is," has made no independent investigation of the data, and makes no representation as to the accuracy or completeness of the data. Please see each source for available documentation of its respective datasets.				
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City of Isle of Palms
Charleston County, SC
Phase 3 Drainage Outfall Design and Permitting
Basin Map



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File: W:\MARKETING\SUBMITTALS\2018\City of Isle of Palms 3 Outfalls\GIS\MXD\Outfall.mxd				Vertical Datum:
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City of Isle of Palms

Charleston County, SC

Phase 3 Drainage Outfall Design and Permitting
Outfalls



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FEE PROPOSAL

Thomas & Hutton has carefully studied the City of Isle of Palm's request for proposals, including the project's background, goals, design objectives, etc. We developed an expanded project approach and scope of services that will successfully provide all the necessary services to implement this project. In addition, we coordinated with our highly qualified sub-consultants as to their roles in the project and the services they are to provide. As mentioned in this proposal, we have worked previously with each of our sub-consultants and are confident in their abilities (including developing a scope of service and subsequently meeting their estimated budget requirements).

In developing our scope of services and our fee proposal, we relied on our extensive and recent experience for the resources and level of effort required to accomplish each individual task. To provide a complete scope of services, we made several assumptions (based on our past experiences and our assessment of the project), which are outlined in our project understanding and approach. We have included all anticipated services based on our assumptions and believe that the proposed fee is appropriate and complete for the project as described in the City's RFP and further detailed in our project understanding and approach.

Our proposed fee and fee structure can be found on the following page. The proposed fees are broken down by the tasks (or services) listed in the City's request for qualifications.



City of Isle of Palms - Phase 3 Drainage Outfall Design and Permitting
Proposed Fee Breakdown
September 5, 2018

Description	Type of Fee	Fee
Base Project		
Existing Data Collection and Analysis (City Scope of Work Item 1)	Lump Sum	\$12,500
Survey and Wetlands/Critical Area Delineations (City Scope of Work Item 2)	Lump Sum	\$26,900
Study, Alternatives Analysis and Recommended Outfall Improvements (City Scope of Work Items 3 and 4)	Lump Sum	\$55,700
Engineering Design and Plans Preparation (City Scope of Work Item 5)	Lump Sum	\$83,000
Permitting Phase (City Scope of Work Item 6)	Time & Expense	\$66,200
Opinions of Probable Construction Costs (City Scope of Work Item 7)	Lump Sum	\$15,300
Funding Assistance (City Scope of Work Item 8)	Time & Expense	\$12,900
Project Phasing Plan (City Scope of Work Item 9)	Lump Sum	\$7,800
Project Schedule Development (City Scope of Work Item 10)	Lump Sum	\$5,700
Project Administration and Meetings (City Scope of Work Item 11)	Lump Sum	\$37,300
TOTAL BASE PROJECT FEE		\$323,300
Alternates		
Bid Phase Services (City Scope Alternate #1)	Time & Expense	\$12,100
Construction Phase Services (City Scope Alternate #2)	Time & Expense	\$58,000
TOTAL ALTERNATES FEE		\$70,100

THOMAS & HUTTON

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CITY OF ISLE OF PALMS, SC

PHASE 3 DRAINAGE OUTFALL
DESIGN & PERMITTING

September 28, 2018

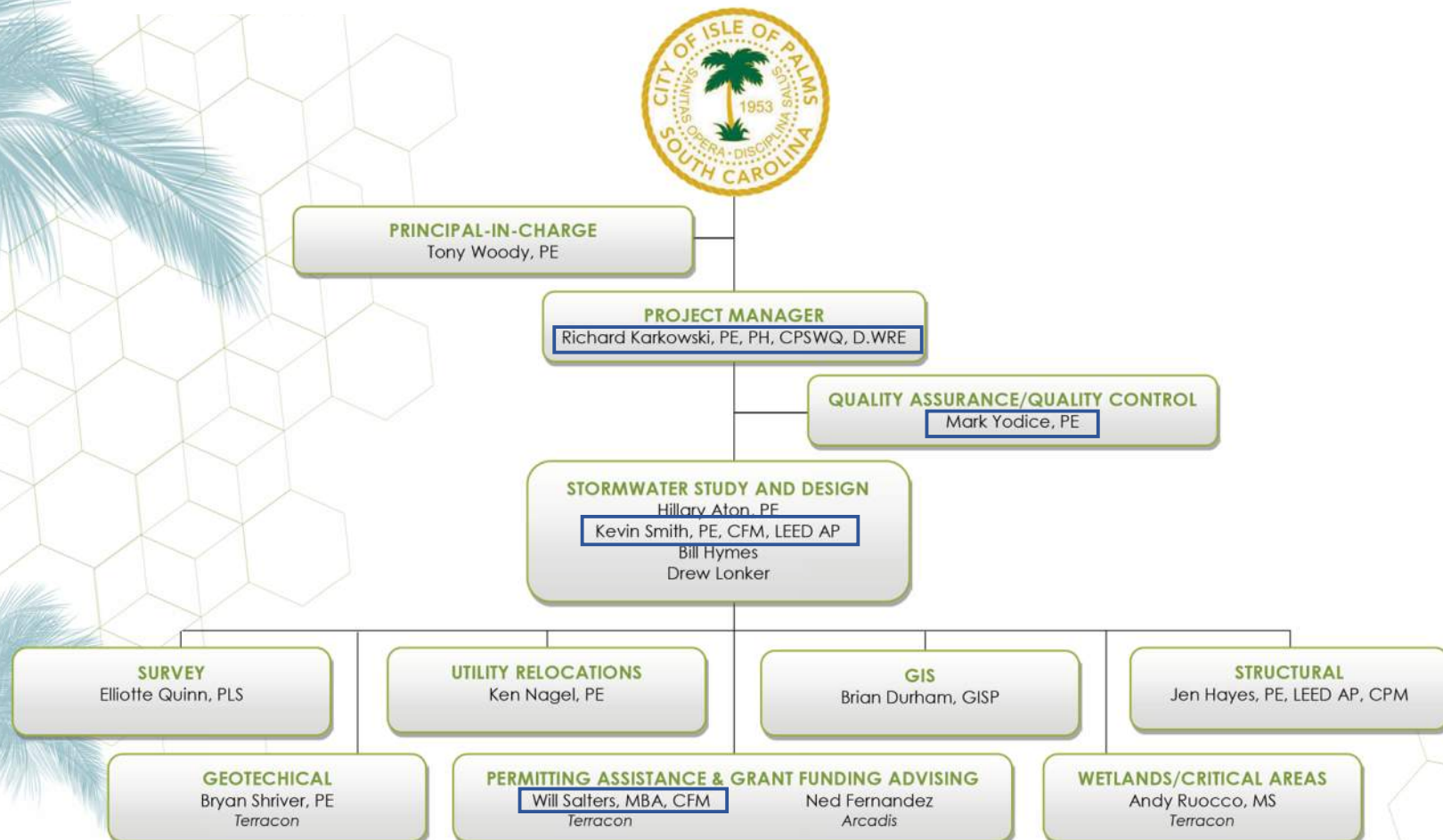


Presentation Outline



- Project Team
- Qualifications
- Project Understanding
- Project Approach
- Project Schedule
- Project Fee

Project Team



Project Team



■ Prime Consultant

- Project Management & Administration
- Data Collection / Analysis
- Survey
- Study, Alternatives, and Recommendations
- Engineering (Civil, Structural, Utilities)
- Permitting
- Bidding
- Construction Administration

■ Sub-consultant

- Geotechnical Investigations / Design
- Wetlands / Critical Area Permitting
- Funding

■ Sub-consultant

- Funding

West Locating, LLC

- Minor Sub-consultant
 - Utility Locating / SUE

Qualifications – Stormwater Management Areas of Expertise



• MUNICIPAL/COUNTY STORMWATER SERVICES

- Stormwater Capital Improvement Projects
- Stormwater Inventory/GIS Database Preparation
- Regional Stormwater BMP Design
- Canal/Riverine Improvements
- Storm Drainage System Remediation Rehabilitation
- Storm Drainage System Maintenance Planning
- Stormwater Master Plans
- MS4 Consulting

• STUDIES/MODELING

- Feasibility Studies
- Watershed Management Planning
- Hydrologic, Hydraulic, and Water Quality Modeling
- Water Quality Studies and Sampling
- Site Specific Stormwater Studies
- Sour Analysis
- Riverine and Coastal Studies

• DESIGN

- Geotechnical, Groundwater, and Infiltration Evaluation
- Stormwater Master Plans
- Stormwater Capital Improvement Construction Plans

- Structural Design
- Roadway Design
- Traditional Pavement/Pervious Pavement
- Regional Best Management Practices
- Canal/Riverine Improvements
- Stormwater System Remediation/Rehabilitation
- Storm Drainage System Maintenance Planning
- Permitting Assistance

• CONSTRUCTION

- Bid Assistance
- Construction Observation
- SWPPP Book Preparation
- Project Closeout

• FEMA RELATED SERVICES

- Base Flood Elevation Determination
- Hydrologic & Hydraulic Analysis
- Community Consulting
- GIS Integrated FEMA Analysis and Mapping
- Letter of Map Revision/Letter of Map Amendments
- Public Assistance/HMGP/Other Funding Assistance

Qualifications - Active Drainage CIP Clients



- City of Charleston, SC
- Charleston County, SC
- Town of Mount Pleasant, SC
- Town of Sullivan's Island, SC
- Town of Summerville, SC
- City of Columbia, SC
- Horry County, SC
- City of Lake City, SC
- Town of Surfside Beach, SC
- City of Savannah, GA
- Chatham County, GA
- City of Garden City, GA
- City of Port Wentworth, GA
- City of St. Mary's, GA
- City of Tybee Island, GA
- Multiple Private Development Clients

Qualifications - Applicable Past Projects



■ Canals and/or Tide Control Structures

- City of Charleston – Forest Acres
- City of Savannah – Bilbo Canal
- City of Savannah – Wilshire Canal
- City of Hilton Head Island – Sandfiddler Outfall
- City of Hilton Head Island – Baynard Cove Outfall
- Town of Summerville – Arbor Oaks (Flood Control)
- Charleston County – NRCS Canals
- City of Tybee Island – Backflow Prevention
- Private Client – Kiawah River
- Private Client – WestEdge

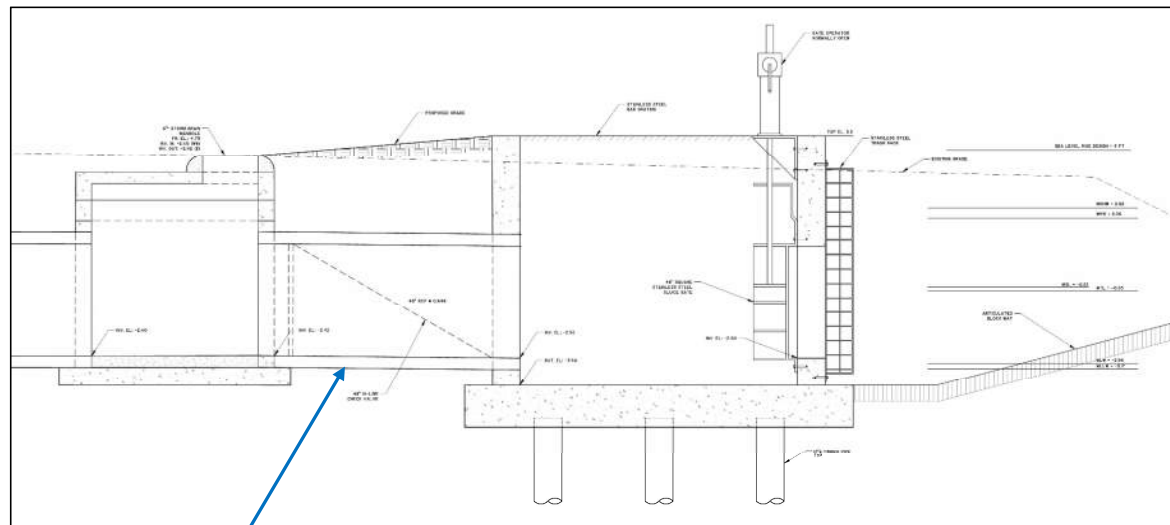
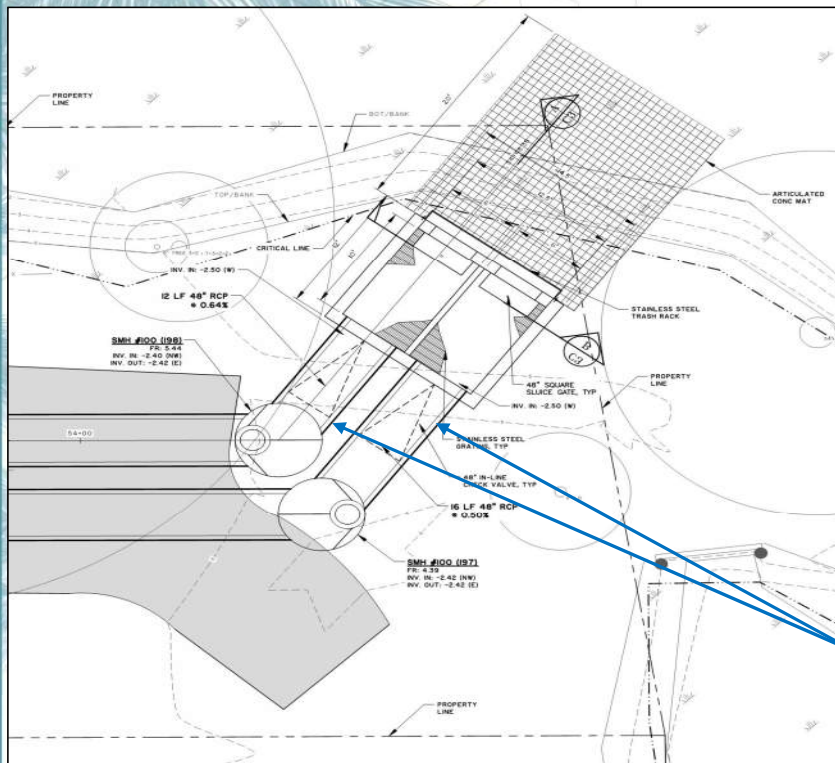
■ Stormwater Pump Stations

- Sullivan's Island – Sta. 18 at Atlantic Avenue
- Town of Mount Pleasant - Edwards Park
- City of Charleston – Forest Acres
- City of Hilton Head Island – Jarvis Creek
- City of Hilton Head Island – Lawton Canal
- City of Savannah – Springfield Canal

Project Understanding

- City Goal(s)

- Identify the appropriate area where the back of the island should be sealed from the intrusion of tidal waters from backing into the system
- Design and permit drainage system outfall systems that will seal the tidal water out, while allowing stormwater to exit



Project Understanding

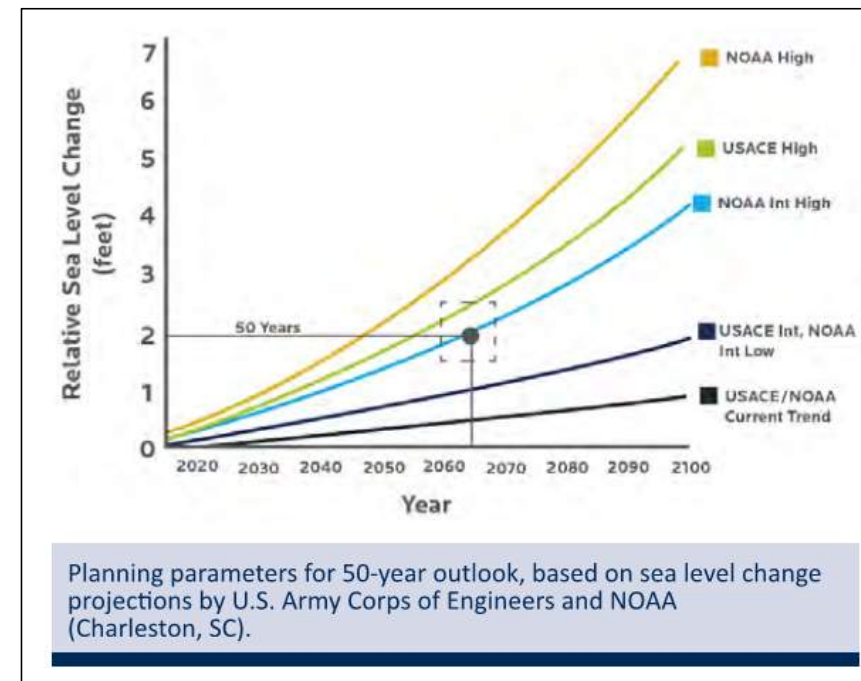
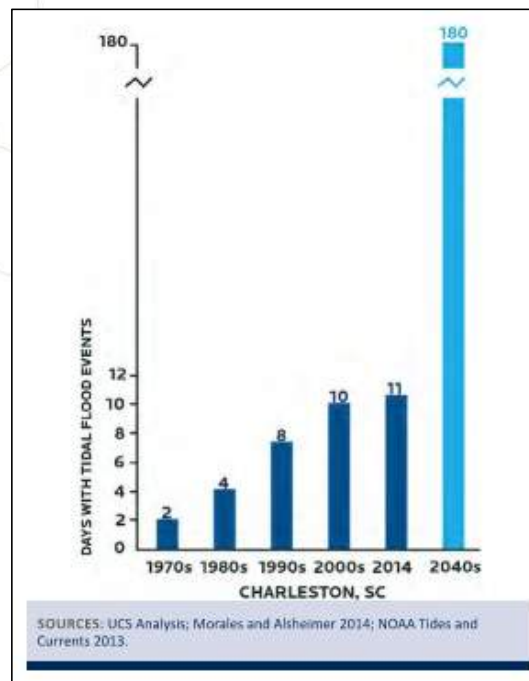
- City Goal(s)

- Be designed and sized appropriately to provide for future drainage improvements within the basins associated with each of the three outfalls



Project Understanding

- City Goal(s)
 - Be designed to anticipate a reasonable expectation of sea level rise



Project Understanding

• City Goal(s)

- Be designed to anticipate a reasonable expectation of increase in impervious surfacing on the island
- Be designed to anticipate a high level of soil saturation before storms

Increase in Impervious Area



Saturated Soils

Outdated Science (NRCS, 1986)

CN (AMC II)	Adjusted CN	
	CN (AMC I)	CN (AMC III)
"Normal"	"Dry"	"Wet"
50	31	70
51	31	70
52	32	71
53	33	72
54	34	73
55	35	74
56	36	75
57	37	75
58	38	76
59	39	77
60	40	78
61	41	78
62	42	79
63	43	80
64	44	81
65	45	82
66	46	82

Current Science (Kannan, et al, 2007)

$$CN_t = \frac{1200}{\left(\frac{1200}{CN_{t-1}}\right) + [ET - (P - Q)]_t}$$

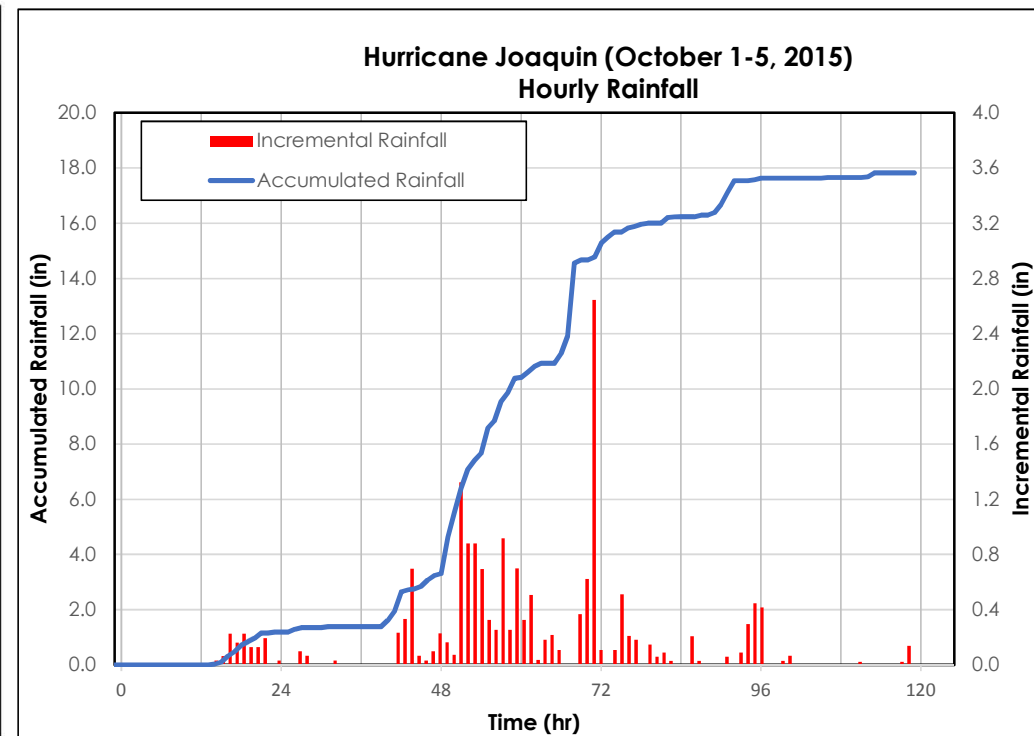
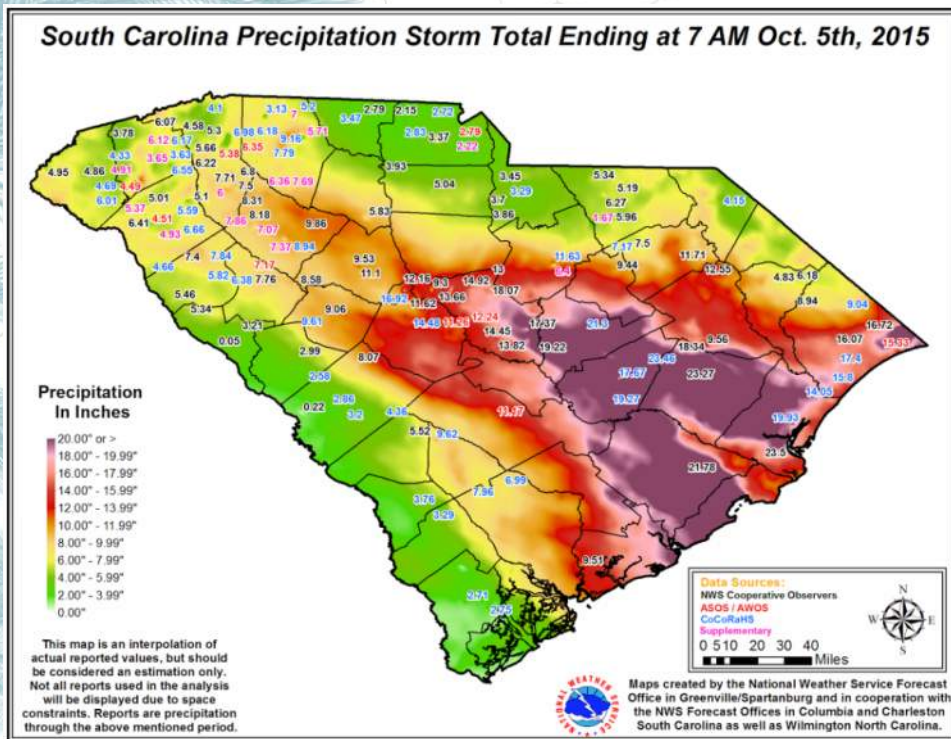
Where:

Q = runoff (in)
P = rainfall (in)
CN = curve number
ET = is evapotranspiration

Project Understanding

- City Goal(s)

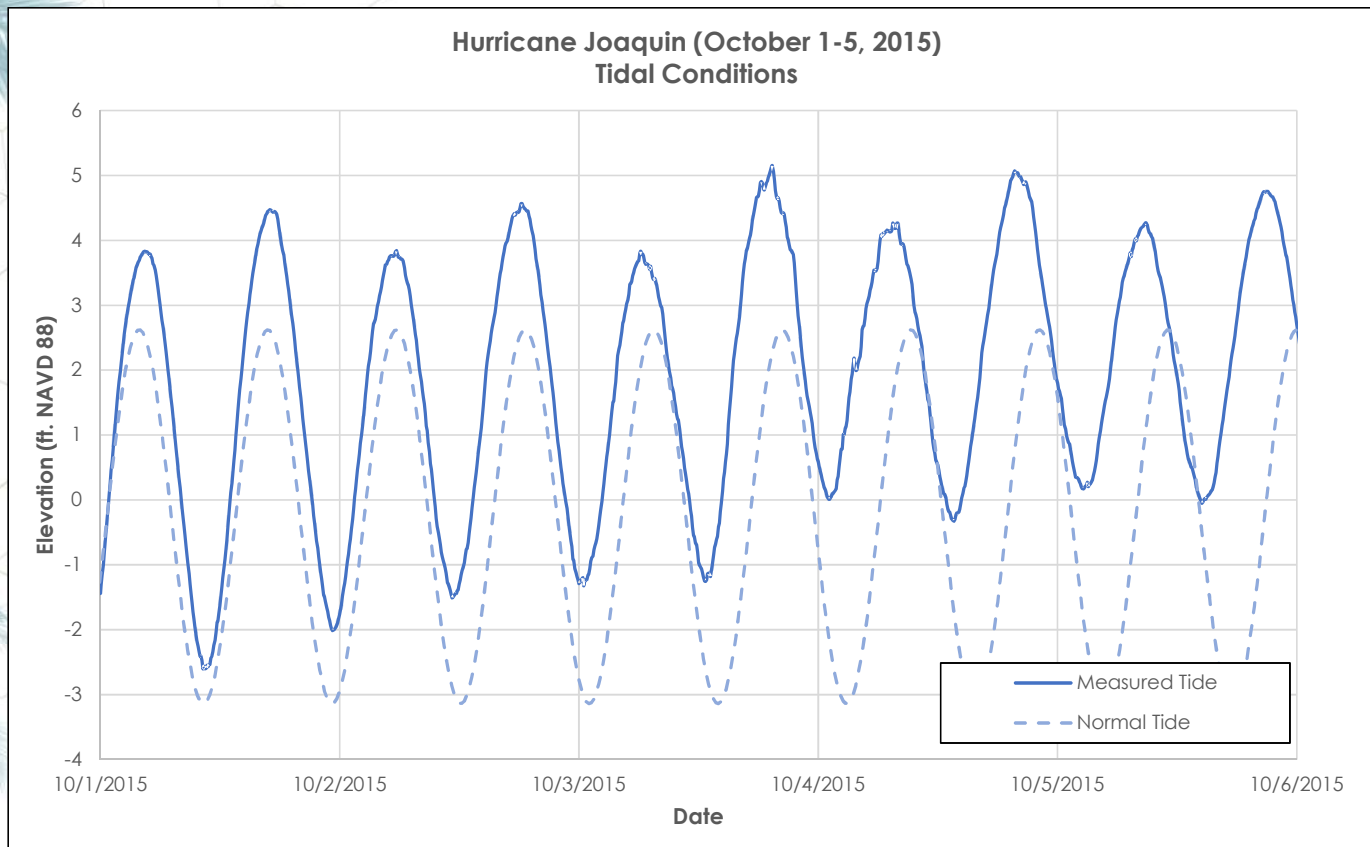
- The design should be to a level that would have kept flood waters associated with Hurricane Joaquin from damaging houses



Project Understanding

- **City Goal(s)**

- The design should be to a level that would have kept flood waters associated with Hurricane Joaquin from damaging houses (Cont'd)



Project Approach



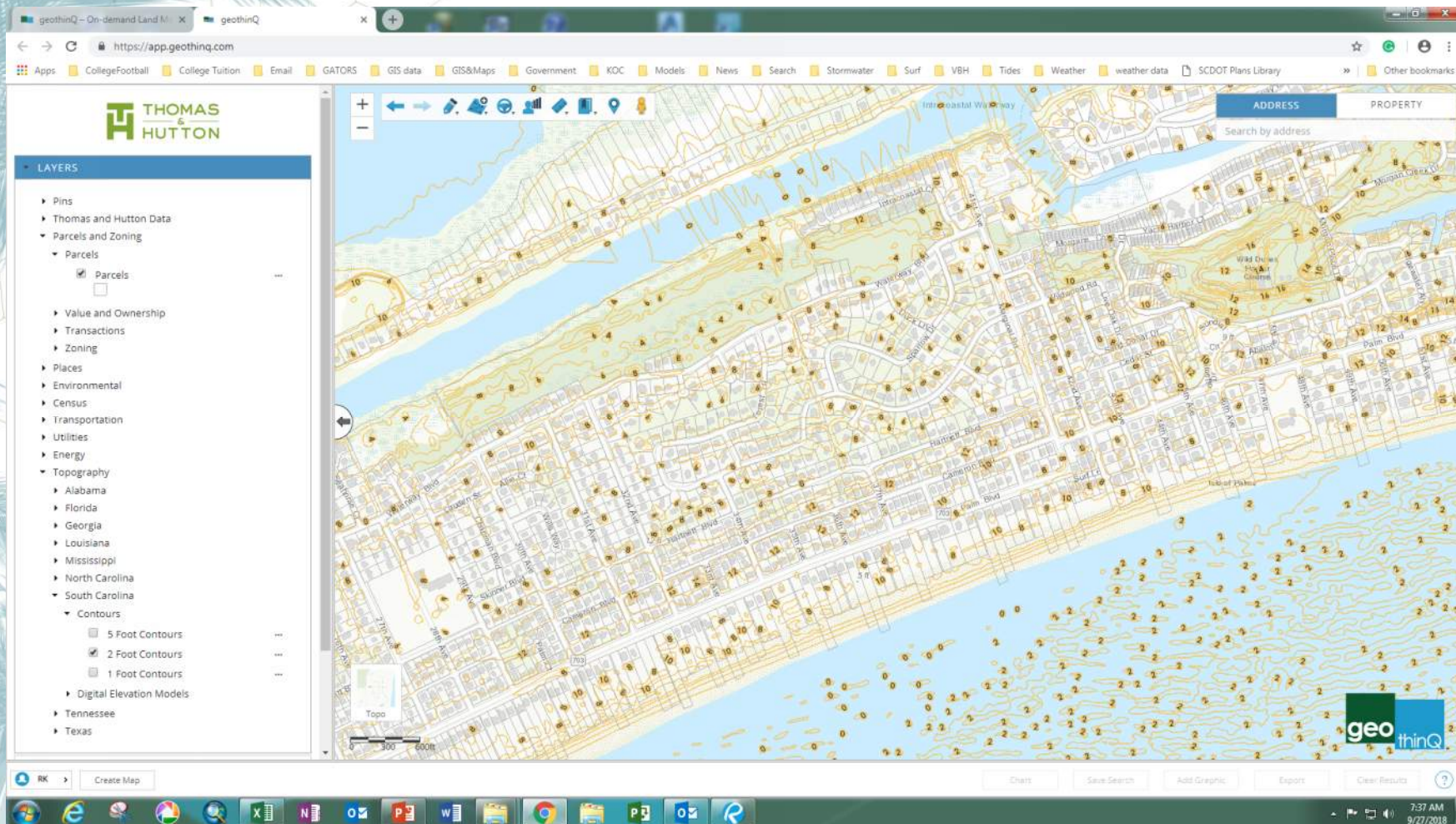
■ Design & Permitting

- Existing Data Collection and Analysis
- Survey and Wetlands/Critical Area Delineations
- Study, Alternatives Analysis, and Recommended Outfall Improvement
- Engineering Design and Plans Preparation
- Permitting
- Opinion of Probable Construction Cost
- Funding Assistance
- Project Phasing Plan
- Project Schedule Development

■ Bidding & Construction

- Bid Phase Services
- Construction Phase Services

Project Approach – Existing Data Collection and Analysis



Project Approach – Survey and Wetlands/Critical Area Delineations



■ Survey

■ Public Outreach

- Flyer
- City Website
- Social Media

■ Property Access Coordination

■ Utility Locating and Marking

■ Field Surveys

- Uplands
- Limited Bathymetric

■ Wetlands / Critical Area Delineations

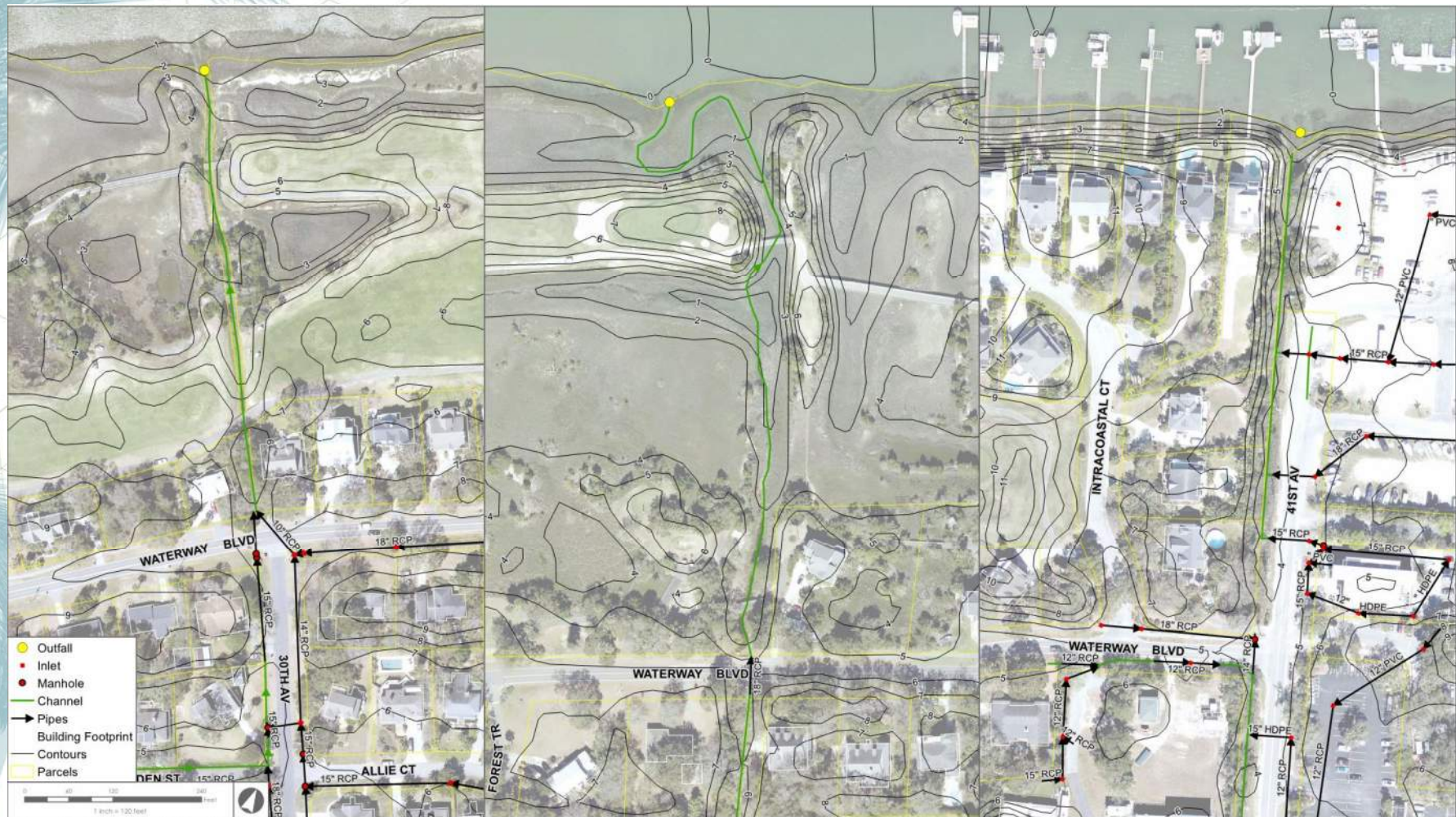
■ Field Work

■ USACOE / SCDHEC-OCRM Coordination

■ Plat (Survey) – Permanent Record of Wetland/Critical Area Limits



Project Approach – Study, Alts. Analysis, and Recommendations



Project Approach – Study, Alts. Analysis, and Recommendations



■ Existing/Design Conditions Study

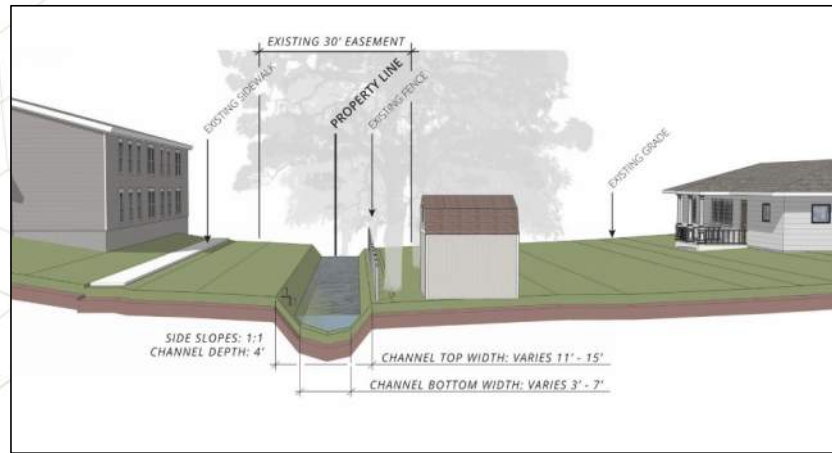
- Field Reconnaissance
- System Identification and Understanding
- Basin/Sub-basin Delineation
- Design Conditions
 - Impervious
 - Saturated Soils
- Hydrologic & Hydraulic Modeling
- Multiple Events / Boundary Conditions
 - 2-, 10-, 25-, 50-, 100-, 500-year; H. Joaquin
 - Normal tide, King tide, Sea Level Rise, etc.

■ Alternative Analysis

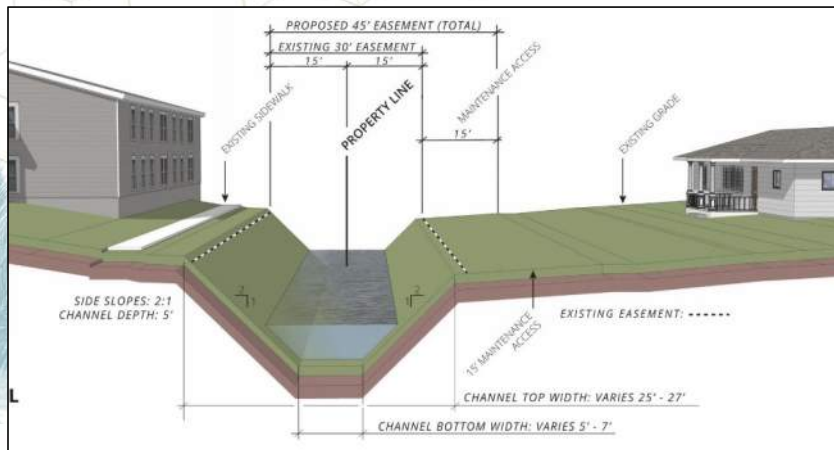
- Basins / Outfalls
- Locations
- Alignment
- Type
 - Open Channel
 - Closed (Pipes, Box Culvert, Bottomless, etc.)
 - Pumping
- Environmental, Property, and Aesthetic Impacts

■ Recommendations

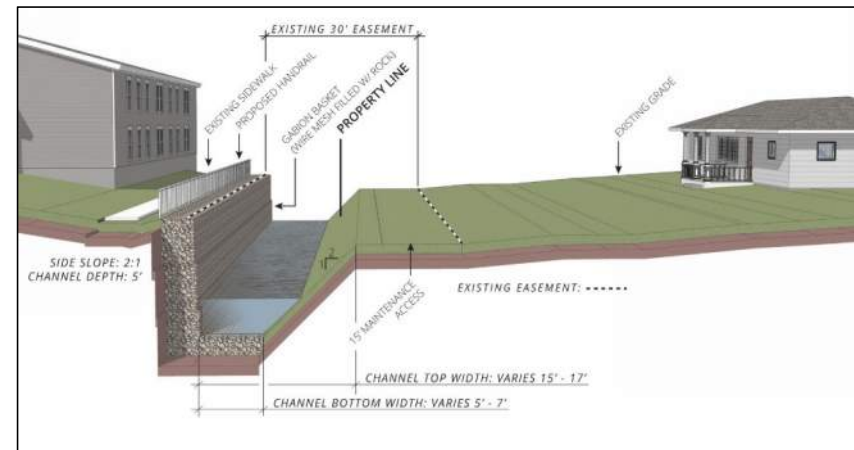
Project Approach – Study, Alts. Analysis, and Recommendations



Existing Conditions



Proposed Alternative 1 – Additional Easement Required



Proposed Alternative 2 – No Additional Easement Required

Project Approach – Engineering Design & Plans Preparation



- Preliminary Design (30%)
- Geotechnical Investigations & Design
- Structural Design
- Final Design (60% and 100%)
 - SWPPP
 - Utility Relocation
 - Traffic Control (detours)



Project Approach – Permitting



- City of IOP MS4 Approval (administered by Charleston County)
- SCDHEC-OCRM – Coastal Zone Consistency Certification
- SCDHEC BOW – NPDES NOI Construction General Permit
- SCDOT Encroachment Permit
- Miscellaneous Encroachment Permits/Approvals/Coordination
 - IOPWSC
 - SCE&G – Power/Gas
 - Miscellaneous “Dry” Utilities – AT&T, Cable, etc.

Project Approach – Permitting

- **USACE Wetland Permit**
 - Nation Wide Permit (NWP) - 2 to 4 months
 - Individual Permit (IP) - 6 to 8 months (sometimes longer)
 - Sampling Analysis Plan may be required
- **SCDHEC-OCRM Critical Area Permit – 3 to 6 months**
- **Mitigation**
 - Only one third-party salt water mitigation bank (\$60K/credit)
 - Approximately 13.5 credits/acre required for critical area impacts
 - Mitigation may not be required for impacts less than 0.1 acre



Project Approach – Opinions of Probable Construction Costs



- **Conceptual - Study / Alternatives Analysis**
- **Preliminary – 30% Engineering Design**
- **Final – 60% and 100 % Engineering Designs**



Project Approach – Funding Assistance



■ FEMA Mitigation Grant Opportunities

■ Hazard Mitigation Grant Program (HMGP)

- Funding available, when authorized under a Presidential major disaster declaration
- Minor Localized Flood Reduction Projects
- 75/25 match (cash or in-kind)

■ Pre-Disaster Mitigation Grant (PDM) Program

- Funding contingent on Congressional appropriations and distributed on a competitive basis
- Minor Localized Flood Reduction Projects
- 75/25 match (cash or in-kind)
- Current Cycle Application Period: October 1, 2018 – January 31, 2019

■ Flood Mitigation Assistance (FMA) Program

- Funding available through NFIP Fund and appropriated by Congress
- Minor Localized Flood Reduction Projects
- 75/25 match
- Current Cycle Application Period: October 1, 2018 – January 31, 2019

■ Economic Development Administration (EDA) Grant Opportunities

■ EDA Disaster Supplemental Funding

- Subject to the availability of funds, EDA has approximately \$587 million in FY18 supplemental appropriations available for disaster recovery grants
- Resiliency projects & construction activities, including infrastructure enhancement, building new infrastructure including high performance and resilient infrastructure.

■ Integration with other Planning Efforts

- Charleston County Regional Hazard Mitigation Plan
- IOP Comprehensive (Comp) Plan
- IOP Local Comprehensive Beach Management Plan
- FEMA's Community Ratings System (CRS)

■ Successful Past HMGP Grants

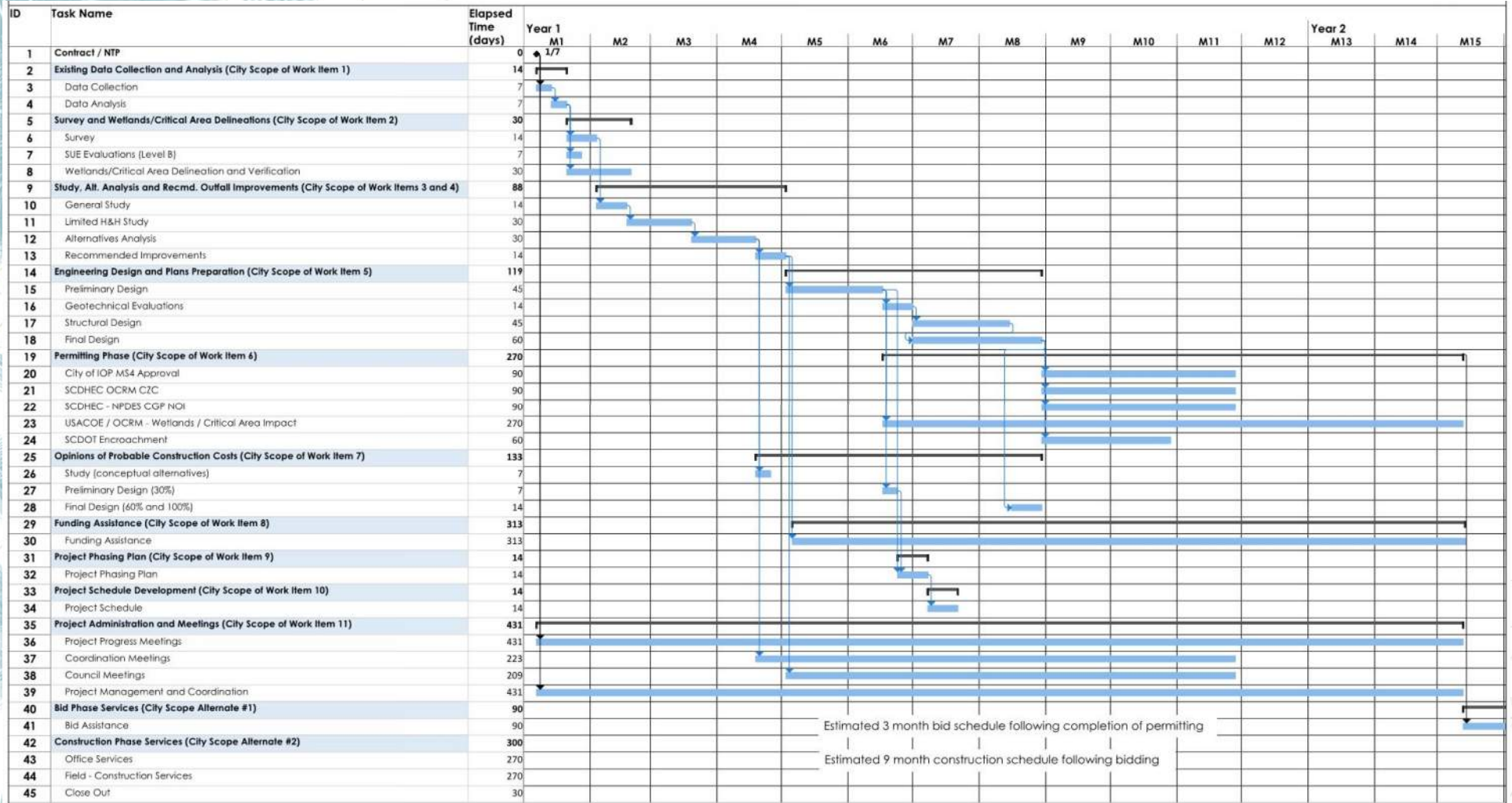
- Charleston County, SC – Main Road Drainage Improvements
- Town of Sullivan's Island, SC – Drainage Improvements
- Isle of Palms WSC – Forest Trails WWTP Floodproofing and Consolidation of Service

Project Approach – Phasing, Schedule, Project Administration & Meetings

- **Project Phasing**
 - “Low Hanging Fruit”
 - Budgetary Constraints
- **Project Schedule**
 - Design & Permitting – Updated Monthly
 - Construction
 - Conceptual (Study/Alternatives)
 - Preliminary (30% Engineering Design)
 - Final (60% and 100% Engineering Design)
- **Project Administration & Meetings**
 - Project Progress Meetings - Monthly
 - Coordination Meetings – As Needed
 - Utilities
 - Property Owners
 - Environmental Agencies and/or Advocacy Groups
 - Three (3) Council Presentations
 - Project Management & Coordination
 - Project Management Plan
 - Monthly Project Status Reports
 - Sub-consultant Coordination



Project Schedule



Project Fee



Phase/Task	Thomas & Hutton Labor														Sub-consultants					TOTAL TASK	TOTAL TASK (Rounded for Proposal)		
	Project Manager / Technical Lead (PM/PE IV)	Senior Engineer (PE III / IV)	Project Engineer (PE I / II)	Senior Designer (D II / III)	Project Designer (D I)	Lead Structural Eng.	Structural Eng. I / IV	Survey Manager (SM I)	Survey Party (2- man)	Survey Tech III	GIS Analyst II	Field Rep. IV	Admin Clerical II	TOTAL LABOR	Wetlands (Terracon)	Geotechnical (Terracon)	SUE (West)	Funding (Terracon /Arcadis)	Reimbursables				
Base Project																							
Existing Data Collection and Analysis (City Scope of Work Item 1)																							
Data Collection	8		16								4			\$4,200					\$150	\$12,470	\$12,500		
Data Analysis	8		40								8			\$8,120						\$8,120			
Survey and Wetlands/Critical Area Delineations (City Scope of Work Item 2)																							
Survey	2			4				16	60	24				\$13,140					\$3,500	\$26,825	\$26,900		
SUE Evaluations (Level B)	2							2						\$640			\$3,500			\$16,640			
Wetlands/Critical Area Delineation and Verification	2							2						\$640	\$5,405					\$4,140			
Study, Alternatives Analysis and Recommended Outfall Improvements (City Scope of Work Items 3 and 4)																							
General Study	20		20		8					8				\$8,100					\$100	\$55,620	\$55,700		
Limited H&H Study	18		80		18					8				\$17,490					\$200	\$8,200			
Alternatives Analysis	40		40		18	18	18							\$19,930						\$17,690			
Recommended Improvements	20		20			9	9						8	\$9,700					\$100	\$19,930			
Engineering Design and Plans Preparation (City Scope of Work Item 5)																							
Preliminary Design	8		16	16	90									\$15,050						\$9,800	\$82,920	\$83,000	
Geotechnical Evaluations	8					8								\$2,720		\$8,970				\$15,050			
Structural Design	2				8	40	80							\$17,200						\$11,690			
Final Design	16	40	40	40	180									\$38,980						\$17,200			
Permitting Phase (City Scope of Work Item 6)																							
City of IOP MS4 Approval	2		16		16									\$4,360						\$38,980			
SCDHEC OCRM CZC	4		8		20									\$3,980					\$150	\$66,120	\$66,200		
SCDHEC - NPDES CGP NOI	8		40		40									\$11,440					\$150	\$4,360			
USACOE / OCRM - Wetlands / Critical Area Impact	2		4		18									\$2,830	\$34,500				\$150	\$3,980			
SCDOT Encroachment	4		40		18									\$8,410					\$150	\$11,590			
Opinions of Probable Construction Costs (City Scope of Work Item 7)																							
Study (conceptual alternatives)	8		12		24									\$5,700						\$15,300	\$15,300		
Preliminary Design (30%)	2		8		16									\$3,200						\$5,700			
Final Design (60% and 100%)	4		16		32									\$6,400						\$3,200			
Funding Assistance (City Scope of Work Item 8)																							
Funding Assistance	18		18											\$5,850	\$3,500.00			\$3,500		\$6,400			
Project Phasing Plan (City Scope of Work Item 9)																							
Project Phasing Plan	8	8	20		20									\$7,800						\$12,850	\$12,900		
Project Schedule Development (City Scope of Work Item 10)																							
Project Schedule	8	8	20											\$5,700						\$7,800			
Project Administration and Meetings (City Scope of Work Item 11)																							
Project Progress Meetings	24		40											\$10,120					\$500	\$5,700			
Coordination Meetings	12		12											\$3,900					\$100	\$10,620			
Council Meetings	12	8	24											\$7,000					\$200	\$4,000			
Project Management and Coordination	80													\$14,400					\$1,000	\$7,200			
Total Hours	350	64	550	60	526	75	107	20	60	40	12	0	8										
TOTAL	\$63,000	\$10,880	\$79,750	\$6,900	\$55,230	\$12,000	\$12,840	\$2,800	\$7,800	\$3,800	\$1,320	\$0	\$680	\$257,000	\$43,405	\$8,970	\$3,500	\$3,500	\$6,450	\$322,825	\$323,300		
Alternates																							
Bid Phase Services (City Scope Alternate #1)																							
Bid Assistance	18		40			9							18	\$12,010						\$12,010	\$12,010		
Construction Phase Services (City Scope Alternate #2)																							
Office Services	54		96											\$23,640					\$500	\$57,980	\$58,000		
Field - Construction Services												192		\$23,040					\$2,500	\$24,140			
Close Out	4		4		20							40		\$8,200					\$100	\$25,540			
Total Hours	76		140		20	9						232	18										
TOTAL	\$13,680	\$0	\$20,300	\$0	\$2,100	\$1,440	\$0	\$0	\$0	\$0	\$0	\$27,840	\$1,530	\$66,890	\$0	\$0	\$0	\$0	\$3,100	\$69,990	\$70,100		



Stormwater Management Expertise

Local and Integrated Experience

Depth of Resources

STATE OF SOUTH CAROLINA) MEMORANDUM OF UNDERSTANDING
)
COUNTY OF CHARLESTON)

This Memorandum of Understanding (“MOU”) is entered by and between the City of Isle of Palms (“City”) and the Commissioners of Public Works of the City of Isle of Palms doing business as the IOP WSC, (“WSC”). The City of Isle of Palms is an incorporated municipality (1953) with a nine member elected body in a Council form of Government. The Isle of Palms Water and Sewer Commission is a water and wastewater utility with a five member elected body. Both public entities serve the same citizen customers in the same geographic area, but operate separately except that in order for the Isle of Palms Water and Sewer Commission to borrow money, bond issues must be approved, via ordinance, by the City of Isle of Palms City Council.

PREAMBLE

BACKGROUND OF MOU

1. In 2015, the Isle of Palms Planning Commission received a request from City Council to investigate ways to expand the Commissioners of Public Works of the City of Isle of Palms public wastewater collection and treatment system. This work was accomplished over a series of months culminating in a presentation to City Council on August 22, 2017 where the Planning Commission presented suggestions regarding possible courses of action to facilitate that effort and goal.
2. In October 4, 2015, October of 2016 and again in September of 2017, the City experienced flooding associated with three extreme weather events. During two of these events, the flooding caused individual septic systems to malfunction, rendered homes uninhabitable, and created unsanitary conditions in flood waters.

3. Following these weather events, two citizen forums were organized to discuss citizen priorities for Council action. The citizens identified, among other items, drainage and extension of the public sewer as priorities. The City and WSC met on March 21, 2018, to discuss various forms of wastewater treatment to address these citizen concerns. The City and WSC have jointly expressed an interest in investigating the requirements necessary to provide sewer service to the areas of the Isle of Palms not presently receiving sewer service from the WSC.

3. CURRENT EVENTS 2018

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4. The City of Isle of Palms budgeted and adopted \$50,000 in the Fiscal Year 2019 budget to facilitate its ability to fund the updated cost estimates for expansion of the public sewer system.
5. On May 30, 2018, the City and WSC entered into an initial Memorandum of Understanding agreeing to a 50:50 cost share of a \$38,600 study to update the island's sewer master plan.
6. Thomas and Hutton was engaged to perform the tasks detailed in the initial MOU based on their history and their participation in the original sewer master plan for WSC in the 90's.
7. The City of Isle of Palms and WSC further agree that the proliferation of non-traditional treatment systems, like grinder pump systems, are less than ideal, unsightly, rarely have alternative power supplies making them non-functional during periods of power outages.
8. WSC has previously taken the proactive position in their agreements with customers having grinder pump systems that when public sewer becomes available, those

customers are required to abandon the grinder pump systems and connect to the public sewer at their expense.

9. WSC has engaged the services of a rate consultant who has completed a study on impact fee increases, and this modeling will facilitate gathering of needed rate and cost information for future extensions.

~~9.~~ FUTURE EXPECTATIONS

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10. The City and WSC commit to a goal to improve the barrier island environment, increase sustainability and improve property values. This MOU is intended to provide a road map of working together to so tThe parties to this agreement ~~shall plan to~~ achieve this goal by systematically expanding WSC's public sewer system in a planned, safe sequence that is not only economically viable but also maximizes grant resources to mitigate costs to the customers.

11. The City and WSC agree that they are providing public service to the same customers.

- ~~11.~~12. The City and WSC set a target of realizing this goal for their citizen customers by no later than ten (10) years from the date of this agreement.

- ~~12.~~13. This work and analysis will comprise data provided by Thomas & Hutton, as well as information on flood complaints; repetitive losses from flooding; the concentration of grinder pumps, new grinders and grinder requests; malfunctioning septic tanks; requests for sewer service; areas lacking service; and downstream improvements/impacts.

- ~~13.~~14. The City and WSC agree to support one another in the pursuit of available grant funding for areas which may qualify. Funding, and issues related to proximity to the treatment

plant, may also become a determining factor in the timing and location of phases towards accomplishing the goal.

~~14.~~15. When necessary, the City and the WSC shall develop any required ordinances as a means of facilitating individual homeowners connecting their properties to the system, once available, without undue financial hardship to the homeowners. Factors to be considered might be length of home ownership, owner occupancy and Homestead Exemption. Properties with alternative grinder systems, by previous agreement with the Commission, must connect to the system when available.

16. The City and WSC commit to understanding that transparency and sharing of documentation, while still protecting sensitive information and not risking vulnerabilities, serves both entities in service to citizen customers.

~~15.~~17. The City and WSC will ~~improving~~ and ~~facilitating~~ communication during the budgetary process and planning process, ~~continuing to continue~~ to create awareness of the stated goals, ~~and will share reports, and work to~~ coordinate projects for ~~and~~ possible cost saving opportunities created by economies of scale.

18. The City and WSC commit to maximizing grant sources and identifying potential sources of funds in accordance with the attached draft funding plan, to support and facilitate the necessary upgrades to accommodate the connection of all individual systems to the City System.

~~16.~~19. Represented fully and inclusively, the City and the WSC shall acknowledge the need to trust that both are moving in the same direction with the same goal to serve the same citizen customers and so will participate together in meetings and, at least, annually

review the goals, performance and accomplishments of this Memorandum of Understanding.

NOW, therefore, the City and WSC agree that it is the intent of this Memorandum of Understanding to formalize their agreement to cooperate in this endeavor and to the terms of this MOU and the City requests WSC to sign this Memorandum of Understanding and proceed as diligently as possible with achieving the overall goal by the target ten-year deadline.

In Witness Whereof, the parties hereto have duly approved this MOU and their respective representatives have duly signed, sealed, and delivered this MOU as of the dates indicated by each parties' signature.

CITY OF ISLE OF PALMS

Date: _____

By: _____

Mayor, City of Isle of Palms

IOP WSC

Date: _____

By: _____

Dana Love, Chair

DRAFT