



**Public Works Committee**  
3:30 p.m., Wednesday, April 6, 2022  
Council Chambers  
1207 Palm Boulevard  
Isle of Palms, South Carolina

**Public Comment:**

All citizens who wish to speak during the meeting must email their first and last name, address and topic to [nicoled@iop.net](mailto:nicoled@iop.net) no later than **3:00 p.m. the day before the meeting**. Citizens may also provide public comment here:  
<https://www.iop.net/public-comment-form>

**Agenda**

1. **Call to order** - and acknowledgement that the press and public have been duly notified of the meeting in accordance with the Freedom of Information Act.
2. **Approval of previous meeting's minutes** – March 2, 2022
3. **Citizens' Comments** – All comments will have a time limit of three (3) minutes.
4. **Departmental Reports** – Director Pitts and Assistant Director Asero
5. **Old Business**
  - a. Update on Phase III Drainage Project
  - b. Update and consideration of proposals for the installation of improvements to golf cart path along Ocean Park Plaza and intersection improvements at Ocean Boulevard and JC Long Boulevard
  - c. Discussion of request from The Dinghy to relocate existing compactor located at the small Municipal Parking lot
6. **New Business**
  - a. Presentation of status update on Phase 4 Drainage Comprehensive Masterplan by David & Floyd
  - b. Discussion of existing requirements related to new development and submittal of a stormwater management plan
  - c. Discussion of recommendation by the Environmental Advisory Committee for consideration of a resolution to support climate change action
  - d. Discussion and consideration of pavement repairs at Palm Boulevard & 45<sup>th</sup> Avenue
  - e. Discussion and consideration of drainage improvements at the end of 25<sup>th</sup> Avenue
7. **Miscellaneous Business**

Next Meeting Date: 3:30 p.m., May 4, 2022
8. **Executive Session** – If needed
9. **Adjournment**



**PUBLIC WORKS COMMITTEE**  
**4:30pm, Wednesday, March 2, 2022**  
**1207 Palm Boulevard, Isle of Palms, SC**  
**and broadcasted live on YouTube: <https://www.youtube.com/user/cityofisleofpalms>**

**MINUTES**

**1. Call to order**

Present: Council members Bogosian, Hahn, and Ward

Staff Present: Administrator Fragoso, Director Kerr, Asst. Director Asero

Absent: Director Pitts

**2. Approval of previous meeting's minutes – February 3, 2022**

Council Member Hahn made a motion to approve the minutes of the February 3, 2022 meeting, and Council Member Bogosian seconded the motion. The motion passed unanimously.

**3. Citizens' Comments -- none**

**4. Department Reports – Director Pitts and Assistant Director Asero**

Director Pitts said garbage collection was up a little for February while yard debris was up by 40 tons. He spent \$4600 on vehicle maintenance for the month and remains under budget.

Asst. Director Asero reviewed the activities of the Public Works Department in February. Drainage work included reviewing Charleston County stormwater drainage plans for home construction, the completion of ditch cleaning from 32<sup>nd</sup> Avenue to Waterway Boulevard, review of outfall documentation for tide valve installation, vegetation and debris cleaning at 34<sup>th</sup> Avenue between Forest Trail/Waterway Boulevard to 41<sup>st</sup> Avenue, and meeting with Davis & Floyd to discuss alternative methods of ditch cleaning.

Facilities maintenance activities included the completion of City-wide backflow testing, the installation of exterior LED lighting at City Hall, replacement of lightbulbs in Council Chambers, repair of Fire Station 2 generator, repair of duct work at the Public Safety Building, and securing estimates for painting at City Hall.

Work at the Front Beach included the completion of lighting from 10<sup>th</sup> Avenue to the Pavilion, the removal of a bike rack and turtle statue at the VFW to accommodate a larger sidewalk, resetting of the granite monuments, and securing estimates for the sidewalk and brick paver repairs.

The repaving of the 41<sup>st</sup> Avenue sidewalk from the Marina to Wildwood Drive is now complete. Staff is securing estimates for the pruning of all the palm trees on Palm Boulevard from Breach Inlet to 57<sup>th</sup> Avenue. Asst. Director Asero also reported that he has created a work route for weekly litter control between Memorial Day and Labor Day.

Council Member Hahn asked about the parking bumpers along Palm Boulevard and their potential replacement. Administrator Fragoso shared that the earlier conversations and research into that option revealed that it was cost prohibitive. She said that she intends to discuss short-term aesthetics along with bicycle and pedestrian access along Palm Boulevard with SCDOT staff at their meeting on March 4. Further delineation of the parking spaces on the ocean side of Palm Boulevard “is still something that we would want to pursue for SCDOT to do ahead of the season.”

**5. Old Business**

**A. Update on Phase III Drainage Project [Strategic Plan Priority 5, Goal c]**

Administrator Fragoso said not much has changed since the Capital Projects update at the Ways & Means Committee meeting. The contract for the work at the 30<sup>th</sup> and 36<sup>th</sup> avenues outfalls has been executed and is slated to begin in April. The City is awaiting permits for the 41<sup>st</sup> Avenue outfall and is in the process of evaluating the option to pipe a portion of the 41<sup>st</sup> Avenue right-of-way to increase parking on the marina side.

**B. Update on improvements to golf cart path along Ocean Park Plaza [Strategic Plan Priority 1, Goal b]**

Administrator Fragoso said the encroachment permit has been secured. They are working on getting pricing on the construction costs. Administrator Fragoso anticipates the work will only take a few days, but she is attempting to coordinate that work with a larger project on Ocean Boulevard that will facilitate the movement of large delivery trucks.

**6. New Business**

**Discussion of proposed FY223 Operational Budget – Public Works [Strategic Plan Priority 3, Goal b]**

Administrator Fragoso reviewed the areas of the operational budget with the highest increases over FY22 including salaries which is being driven by the approved adjustments from the Wage & Compensation Study, required employer increases to employee retirement, fuel charges, vehicle maintenance, the cost of temporary labor, and contracts which will include a contract for the temporary use of a mini excavator to see if it is something the staff will use before requesting to purchase a used one.

Council Member Bogosian suggested raising the fuel charges even higher. Administrator Fragoso said those will be adjusted as needed throughout the budget process.

She reminded Committee members of some of the projects from the 10-year Capital Plan, noting the portions of the costs of those items that will come from tourism revenues.

Administrator Fragoso said that staff is reevaluating some staffing in the department in light of an upcoming retirement. They would like to restructure the department to allow for a Stormwater Foreman with the current resources. While this will be a new position, it will not be an additional employee. They will present their idea at the upcoming budget workshop.

**B. Discussion of request from The Dinghy to relocate existing compactor located at the Small Municipal Parking Lot**

**MOTION: Council Member Ward made a motion to suspend the rules of order to allow Mr. Bret Jones to speak to this matter. Council Member Hahn seconded the motion. The motion passed unanimously.**

Mr. Bret Jones said that the structure enclosing the compactor in the small municipal parking lot is at the end of its useful life. He would like to see a brick enclosure built at the center of the parking lot. He believes a new and stronger structure would not only be more aesthetically appealing, but also help with the rodent problem in that area. He also said moving the compactor to the center of the lot will create parking spaces.

Administrator Fragoso said that the City pays \$80-\$90,000 annually for the commercial dumpster service that picks up that trash. The business owners who use that compactor split the cost of the County's fee to dump the trash.

Administrator Fragoso said this issue has been discussed in the past. Previous research showed that a move to the center actually reduced the number of parking spaces because of the required setbacks needed around a new structure. The projected expense of the project along with the lost revenue was approximately \$100,000, and so discussion stopped.

Mr. Jones encouraged Committee members to come look at the lot with him. Council Member Ward agreed the area needs to be cleaned up and would like to continue to discuss the matter. Council Member Hahn asked for cost breakdowns of what the City pays, what the business owners pay, and potential costs involved with moving the compactor. Administrator Fragoso said the issue will be discussed at the staff level with Mr. Jones, and ideas will be brought back to the Committee.

**7. Miscellaneous Business**

The next meeting of the Public Works Committee will be Wednesday, April 6, 2022 at 3:30pm.

**8. Adjournment**

Council Member Hahn made a motion to adjourn, and Council Member Bogosian seconded the motion. The meeting was adjourned at 5:13pm.

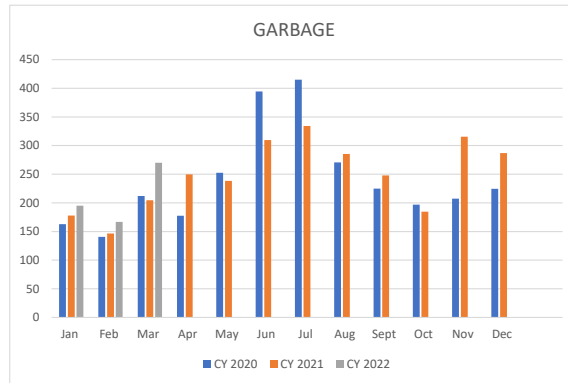
Respectfully submitted,

Nicole DeNeane  
City Clerk



City of Isle of Palms, South Carolina  
Public Works Department - Monthly Report  
Mar-22

	CY 2020	CY 2021	CY 2022
Column1			
Jan	162.77	177.84	195.16
Feb	140.66	146.48	166.74
Mar	212.04	204.6	269.88
Apr	177.52	249.86	
May	252.56	238.23	
Jun	394.38	309.71	
Jul	415.12	334.17	
Aug	270.71	285.21	
Sept	224.87	247.76	
Oct	196.94	184.63	
Nov	207.44	315.31	
Dec	224.45	286.85	



**General duties**

**Sanitation:**

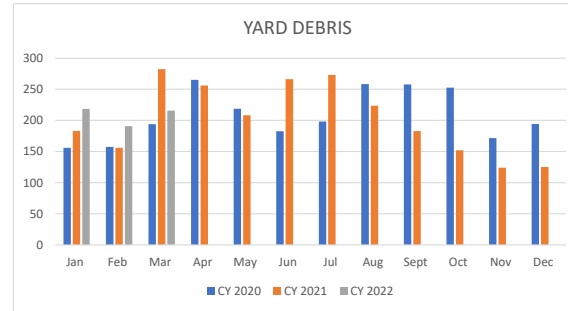
32.66 misc. waste  
was transported to Palmetto Commerce Pkwy. \*\*

**VEHICLE MAINTENANCE** Beginning Budget \$90,000.00

03/01/2022 10-4620.5017	VEHICLE MAINTENANCE		BEG. BALANCE 49,997.94
03/01/2022 AP INV	WELDING OF PUBLIC WORK TRUCK	350.00	50,347.94
03/03/2022 AP INV	OIL CHANGE FOR PW29	112.14	50,460.08
03/08/2022 AP INV	ALUMINUM BAR AND CORNER BRACE	352.62	50,812.70
03/17/2022 JE JE RCLS	SCMIRF SAFETY REBATE TO OFFSET COST 7011	239.64	50,573.06
03/21/2022 AP INV	EMERGENCY LIGHTING FOR PW 31	931.23	51,504.29
03/21/2022 AP INV	FRONT BRAKES AND SENSORS FOR PW 1	1,726.17	53,230.46
03/23/2022 AP INV	PARTS FOR PW 30	63.18	53,293.64
03/31/2022	CR RCPT MISCELLANEOUS	465.62	52,828.02
03/31/2022 10-4620.5017	END BALANCE	3,535.34	705.26 52,828.02

\*Scmirf Public Works safety grant

	CY 2020	CY 2021	CY 2022
Column1			
Jan	155.93	183.07	218.4
Feb	157.44	156.06	190.63
Mar	193.74	282.37	215.58
Apr	265.04	256.07	
May	218.67	208.32	
Jun	182.49	266.23	
Jul	198.07	273.08	
Aug	258.37	223.64	
Sept	257.64	182.96	
Oct	252.81	152.16	
Nov	171.54	124.04	
Dec	194.08	125.14	



**Action Items**

**City of Isle of Palms, SC**  
**Public Works Department**  
**Robert Asero, Assistant Director of Stormwater & Facilities**  
**Monthly Report: March 2022**

**Drainage**

- Reviewing of Charleston County stormwater drainage plans for home construction.
- Eadies services lowering sections of the ditch in Forest Trail.
- Eadies services vegetation cleaning at 4<sup>th</sup> and Palm.
- Eadies services ditch restructuring at 4<sup>th</sup> and Palm.
- Eadies services vegetation/debris cleaning 41<sup>st</sup> Ave.
- Creation of a drainage contingency fund project list.
- Meeting with Thomas and Hutton and SCDOT for 25<sup>th</sup> Ave drainage.
- Creating an outfall list for tide valve installation.

**Facilities**

- Installation of LED lighting at City Hall offices and hallway.
- Painting of office at city hall.
- Repair of stove at fire station 2 and PSB stove scheduled.
- Removal and installation of flagpole, signs and lighting at the new public dock.

**Front beach**

- Litter cleanup of parking lot / Front beach Ocean Blvd. trash and debris by public works.
- Cleanup of municipal lot B back corner parking spots of cement and ROC.
- Managing public restrooms and supplies.
- Estimates for sidewalk repair at front beach.
- Cleaning of graffiti and power washing interior of restrooms by public works.
- Repair boardwalk lights at the public restrooms.
- Repair of toilets and faucets in the public restrooms for upcoming season.

**Landscaping / Rights of way / Connector / Parks**

- Clean up of the connector debris by public works and the sweeping contractor.
- Ongoing installation of replacement and straightening street signs.
- Managing city wide landscape maintenance crews.
- Cleaning and painting of wayfinding signs.
- Scheduled SCDOT to remove graffiti under the Breach inlet bridge.
- Removal of dead palm tree in the right of way.
- Removal of old silt fence on 41<sup>st</sup> Ave.

**Compactor / Dumpster / litter control**

- Cleaned compactor pad and recycling area.
- Removal of bulk items left by the PSB compactor weekly.

**Certifications, training and meetings**

- Monthly UST testing of marina, public works and public safety building.
- Monthly drainage master plan meeting with Davis and Floyd.
- Final walkthrough meeting at the marina fuel dock.
- Meeting with Ashbrit environmental the cities hurricane debris removal contractor.

# Proposal



Charleston, SC Since 1936

# Truluck Construction, Inc.

Site Development – Asphalt Paving – Dock & Marine

P.O. Box 32219 / Charleston, S.C. 29417-2219 Fax: 843-766-5574

1012A St. Andrews Blvd / Charleston, S.C. 29407 / 843-766-5571



PROPOSAL SUBMITTED TO City of Isle of Palms – Douglas Kerr		PHONE 843-886-9912	DATE 3-30-22
STREET PO Drawer 508		JOB NAME 1400 Palm	
CITY, STATE AND ZIP CODE IOP, SC 29451		JOB LOCATION 1400 Palm Blvd., IOP	
ENGINEER Stantec	DATE OF PLANS 2-24-22	<a href="mailto:dkerr@iop.net">dkerr@iop.net</a>	JOB PHONE 843-886-9912

We hereby submit specifications and estimates for:

Price for demolition and grading 9' flat curb with tapers and 150 SF of sidewalk and grading

TOTAL: \$12,000.00

*We Propose*

hereby to furnish material and labor - complete in accordance with above specifications, for the sum of: dollars (\$12,000.00 ).

This estimated offer in proposal form is based on executing an AIA contract and is limited to the Scope of Work listed above. This Proposal shall be an integral part of any contract, purchase order, or work order accepted by the undersigned.

Authorization by Owner or Contractor to begin work on this project prior to their executing this contract constitutes an acceptance of the terms of this contract and/or explicit agreement to execute an Unmodified AIA contract for this work in lieu of executing this Proposal.

Authorized  
Signature \_\_\_\_\_

Note: This proposal is subject to change after 30 days from the date shown above.

*Acceptance of Proposal* - The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment terms are Net 30.

Signature \_\_\_\_\_

Signature \_\_\_\_\_

Date of Acceptance : \_\_\_\_\_



Stantec  
 4969 Centre Pointe Drive, Suite 200  
 North Charleston, SC 29418-6952  
 Tel: (843) 740-7700  
 www.stantec.com



**INDEX OF DRAWINGS**

DRAWING NO.	DRAWING TITLE
1	TITLE SHEET
2	PLAN SHEET
3	DETAILS
4-5	TURNING EXHIBITS

# OCEAN BLVD. & J C LONG BLVD. INTERSECTION IMPROVEMENTS



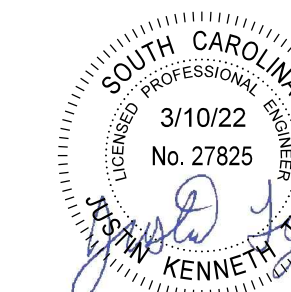
Revision	By	Appd.	MM.DD.YY

Issued	By	Appd.	YY.MM.DD

2022.03.10  
 PROJECT NUMBER: 171002476

User: jye  
 I:\171002476\transportation\roadway\drawings\plan\_sheets\02476\_01\_lth.dgn  
 3/10/2022





S-10-255 (10TH AVE.)

NORTHEAST LAND & HOLDINGS LLC  
TMS\* 568-11-00-149

RYAN PETER & DIANE DENHAESE  
TMS\* 568-11-00-325

- TRAFFIC CONTROL NOTES:
1. INSTALL PERMANENT CONSTRUCTION SIGNING ON OCEAN BOULEVARD (NORTHBOUND ONLY) PER SCDOT STD. DWG. 605-010-02, SCHEME C.
  2. INSTALL PORTABLE PLASTIC DRUMS PER SCDOT STD. DWG. 601-005-00.

S-10-7 (J C LONG BLVD.)

CONCRETE

OCEAN BOULEVARD

24" WHITE SOLID LINES  
SPACED 6' APART

TIE TO EXISTING CONCRETE

CUT AND REMOVE CONCRETE  
AND CONSTRUCT NEW  
ASPHALT PAVEMENT IN  
SHADED AREA

CONCRETE

6" CURB

TIE TO EXISTING CONCRETE

CONCRETE

6" CURB

TIE TO EXISTING CURB

TIE TO EXISTING CURB

5' R  
6" CURB

CUT AND REMOVE CONCRETE  
AND CONSTRUCT NEW ASPHALT  
PAVEMENT IN SHADED AREA

CUT AND REMOVE CONCRETE  
AND CONSTRUCT NEW 8"  
CONCRETE PAVEMENT (CLASS  
2500) IN SHADED AREA

6" CURB

6" WHITE SOLID LINE

WHITE THROUGH ARROW

WHITE THROUGH ARROW

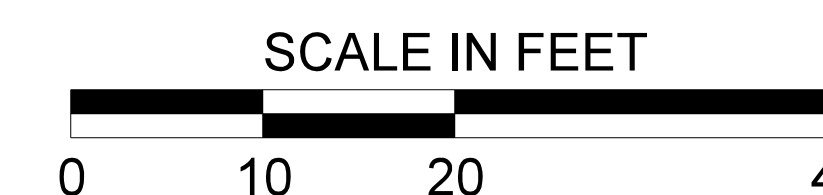
CONCRETE

ASPHALT

DUDLEY S & GLENDA J SPANGLER  
TMS\* 568-11-00-308

BURGIS ATLANTIC LLC  
TMS\* 568-11-00-206

SEASIDE 10P ASSOCIATES LLC  
TMS\* 568-11-00-342





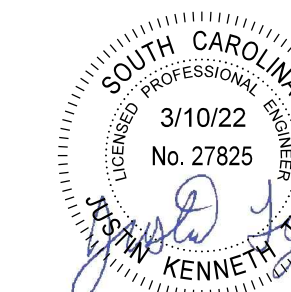


Revision	By	Appd	YYYYMMDD
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CONSTRUCTION PLANS	JKT	JKT	2022.03.10
Issued	By	Appd	YYYYMMDD

File Name: 171002476	JKT	JKT	JKT	2022.03.10
	Dwn.	Dgn.	Chkd.	YYYYMMDD

Permit/Seal



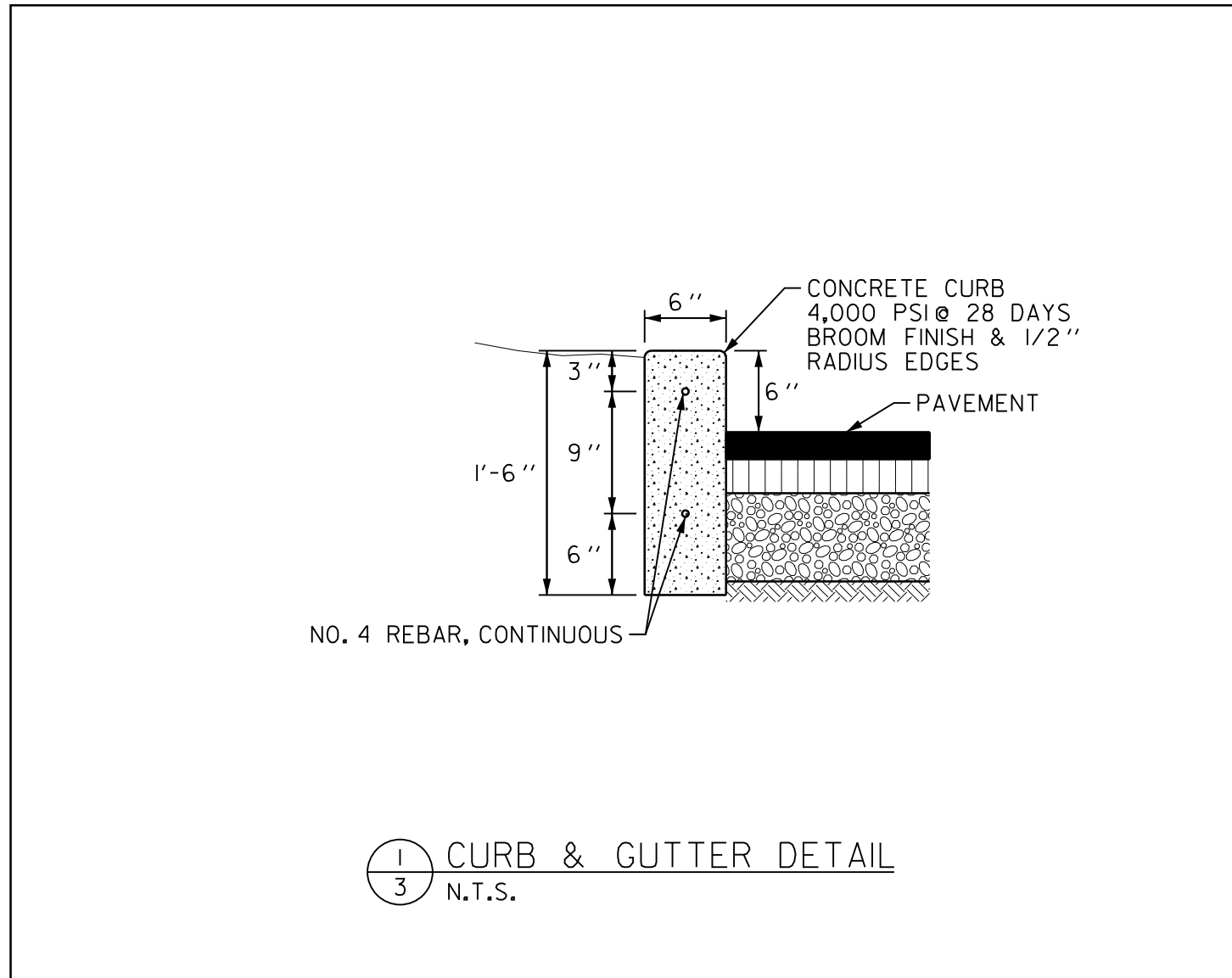
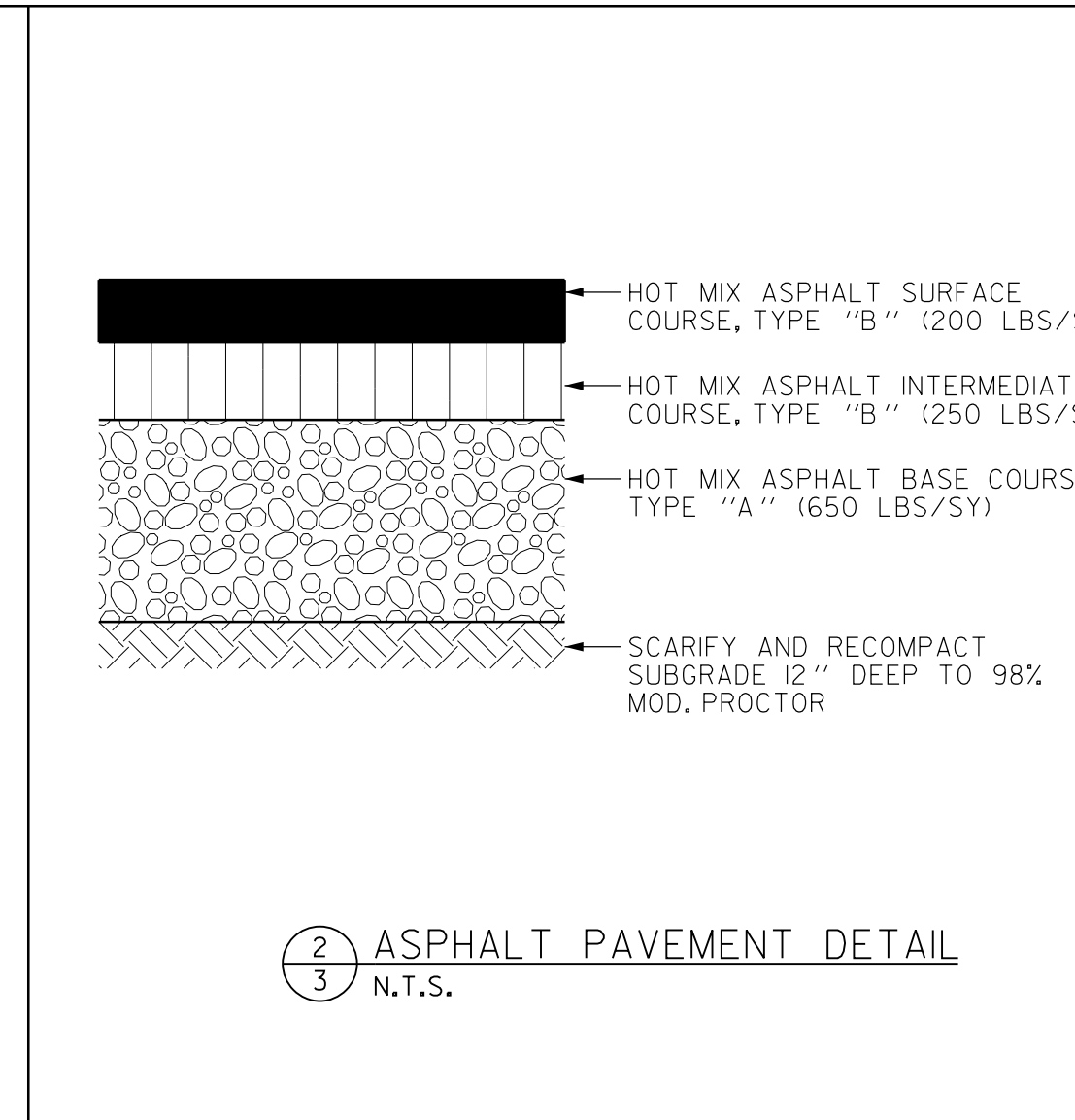
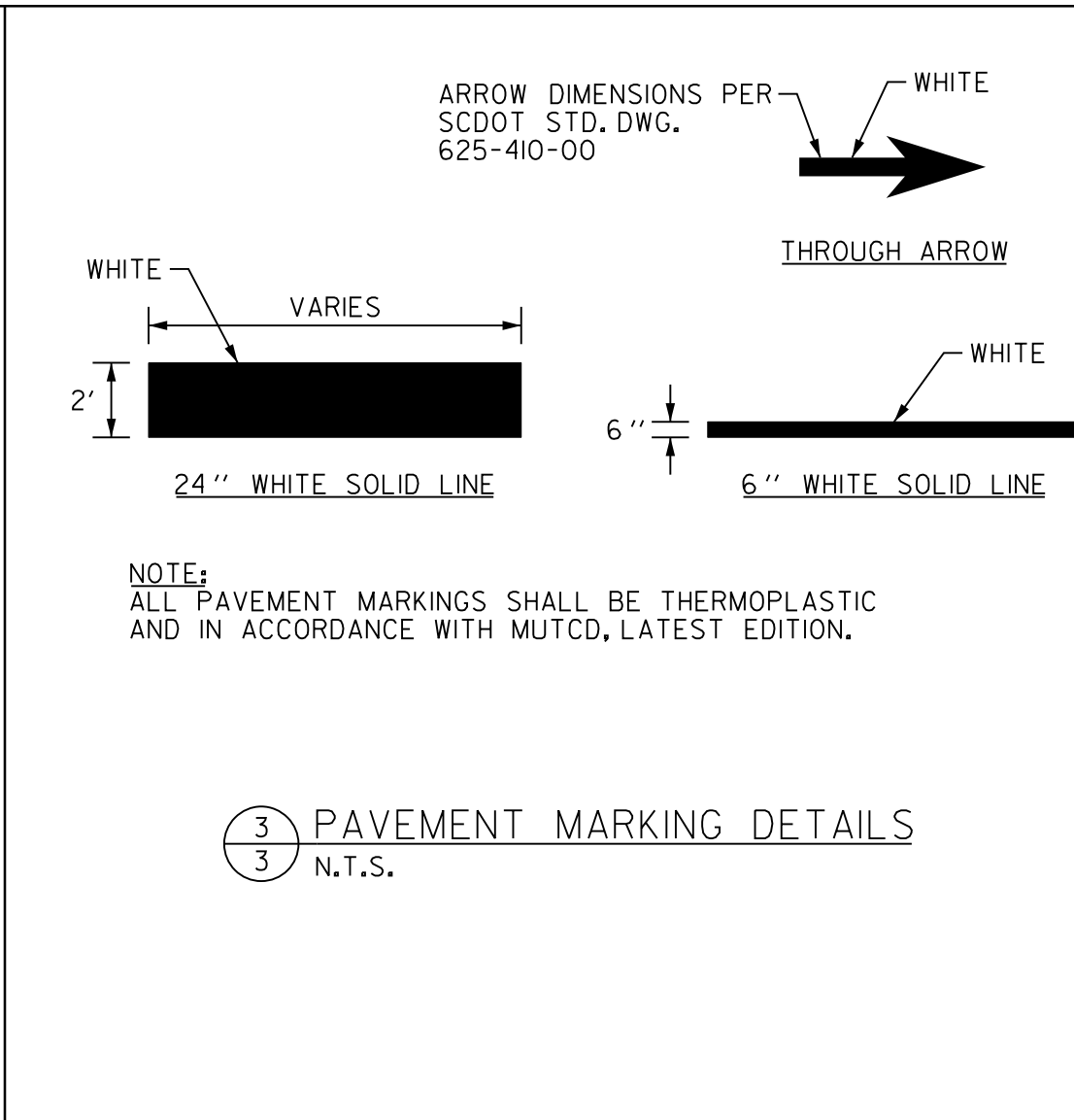
Client/Project Logo

Client/Project  
CITY OF ISLE OF PALMS

OCEAN BLVD. & J C LONG BLVD.  
INTERSECTION IMPROVEMENTS  
Isle of Palms, South Carolina

Title  
DETAILS

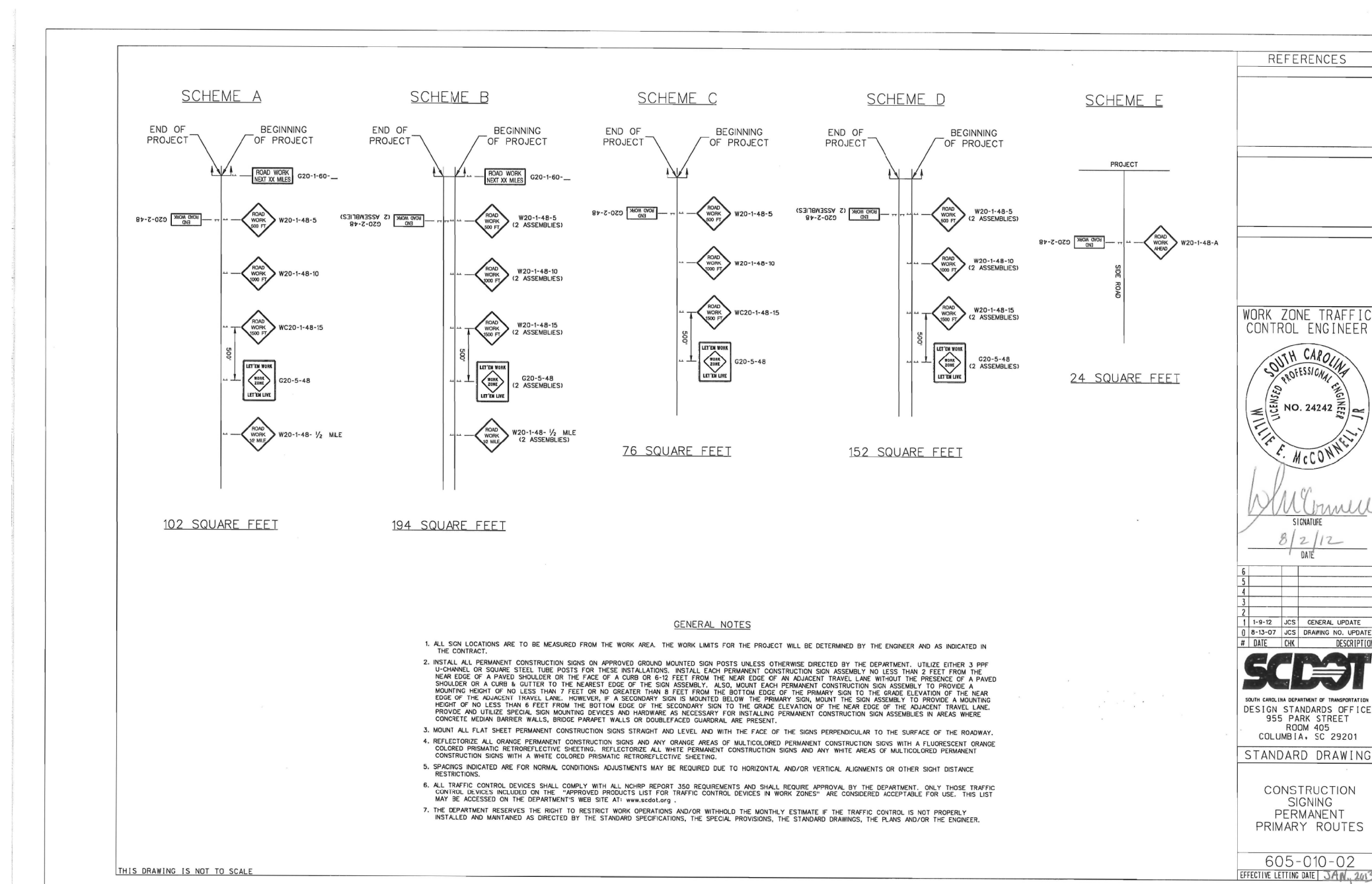
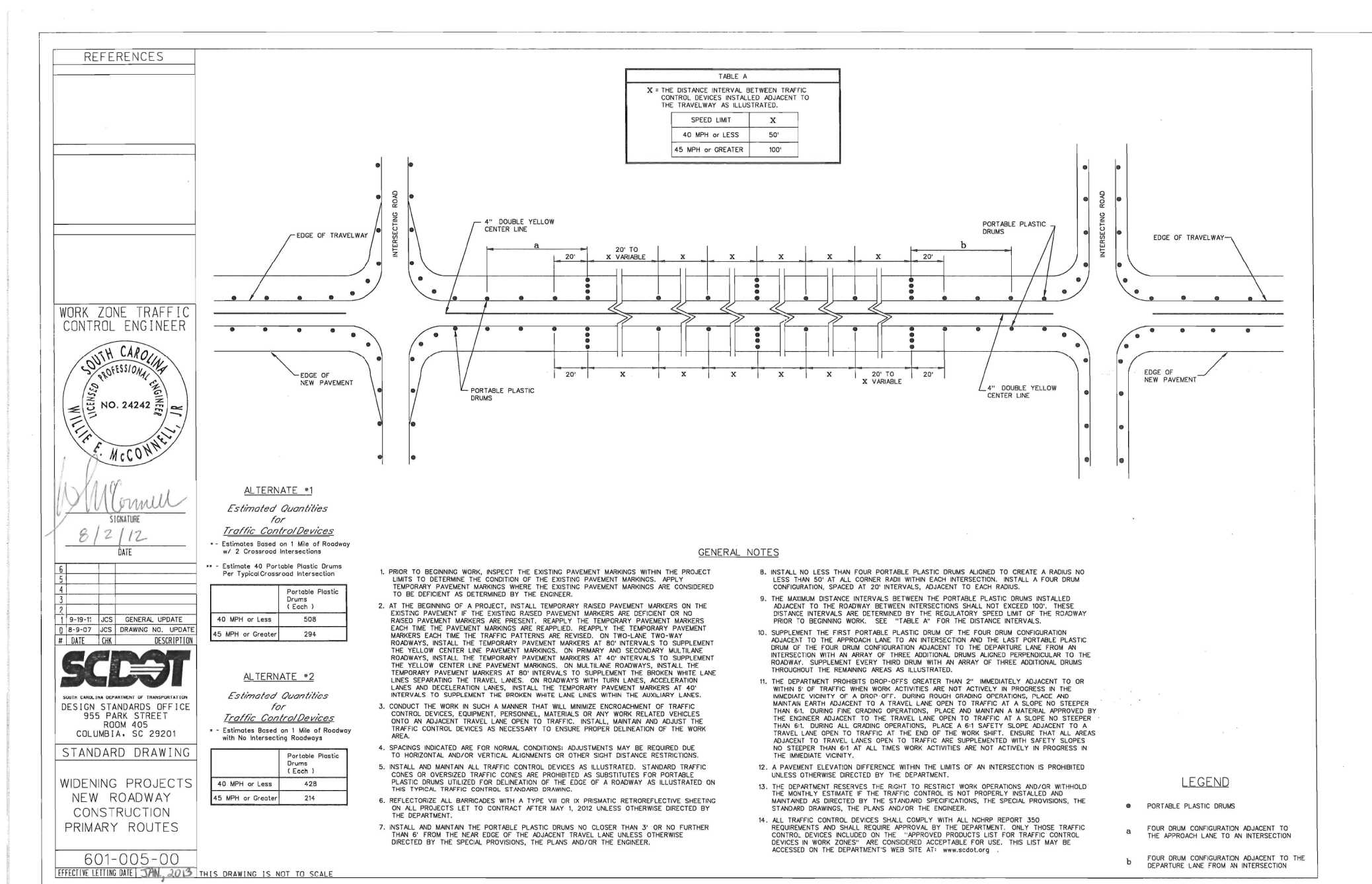
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171002476	N.T.S.	
Revision	Sheet	Drawing No.
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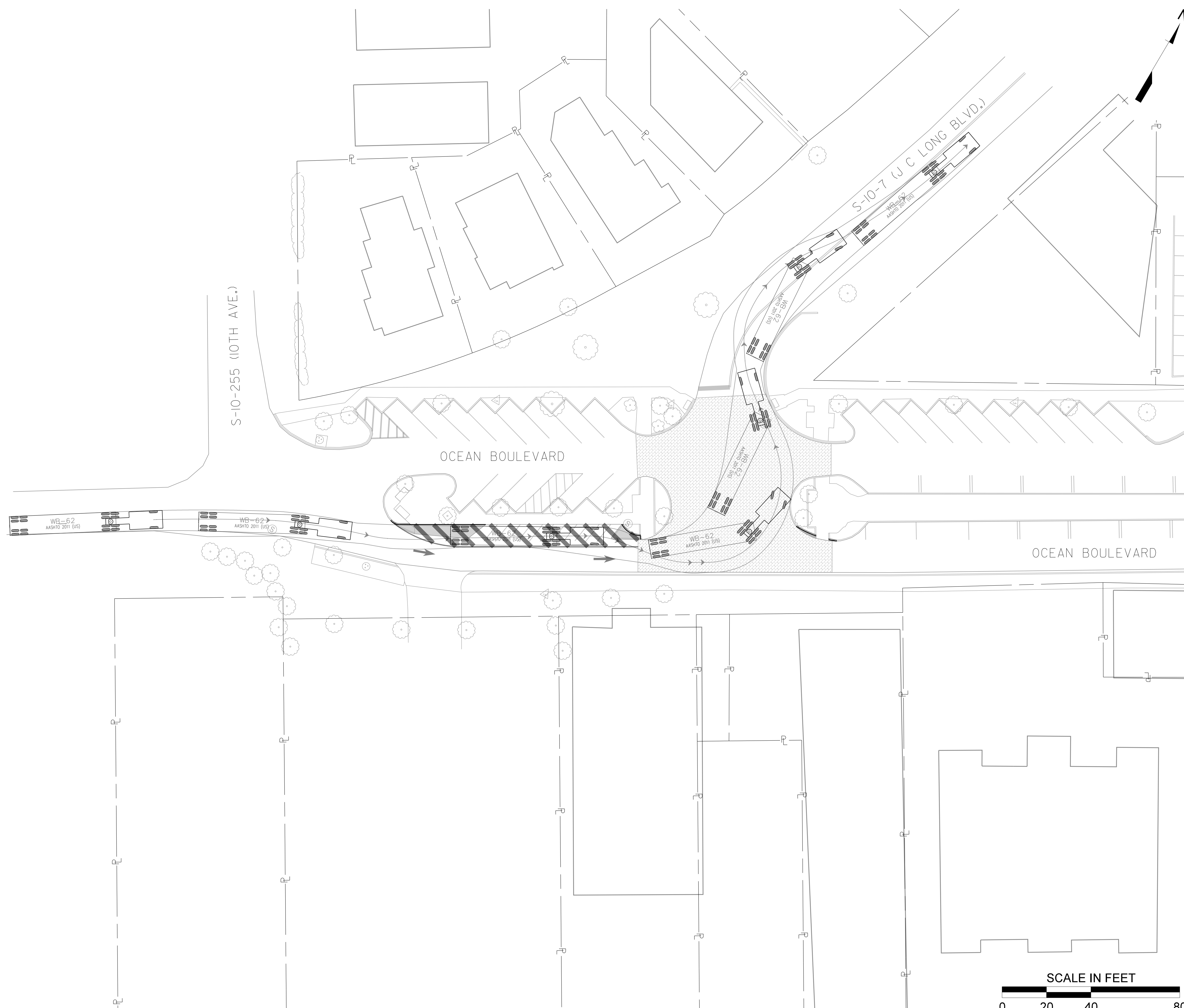
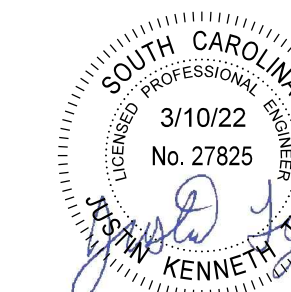
1 CURB & GUTTER DETAIL  
3 N.T.S.

2 ASPHALT PAVEMENT DETAIL  
3 N.T.S.

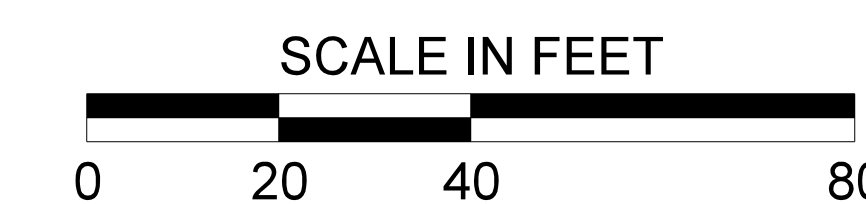
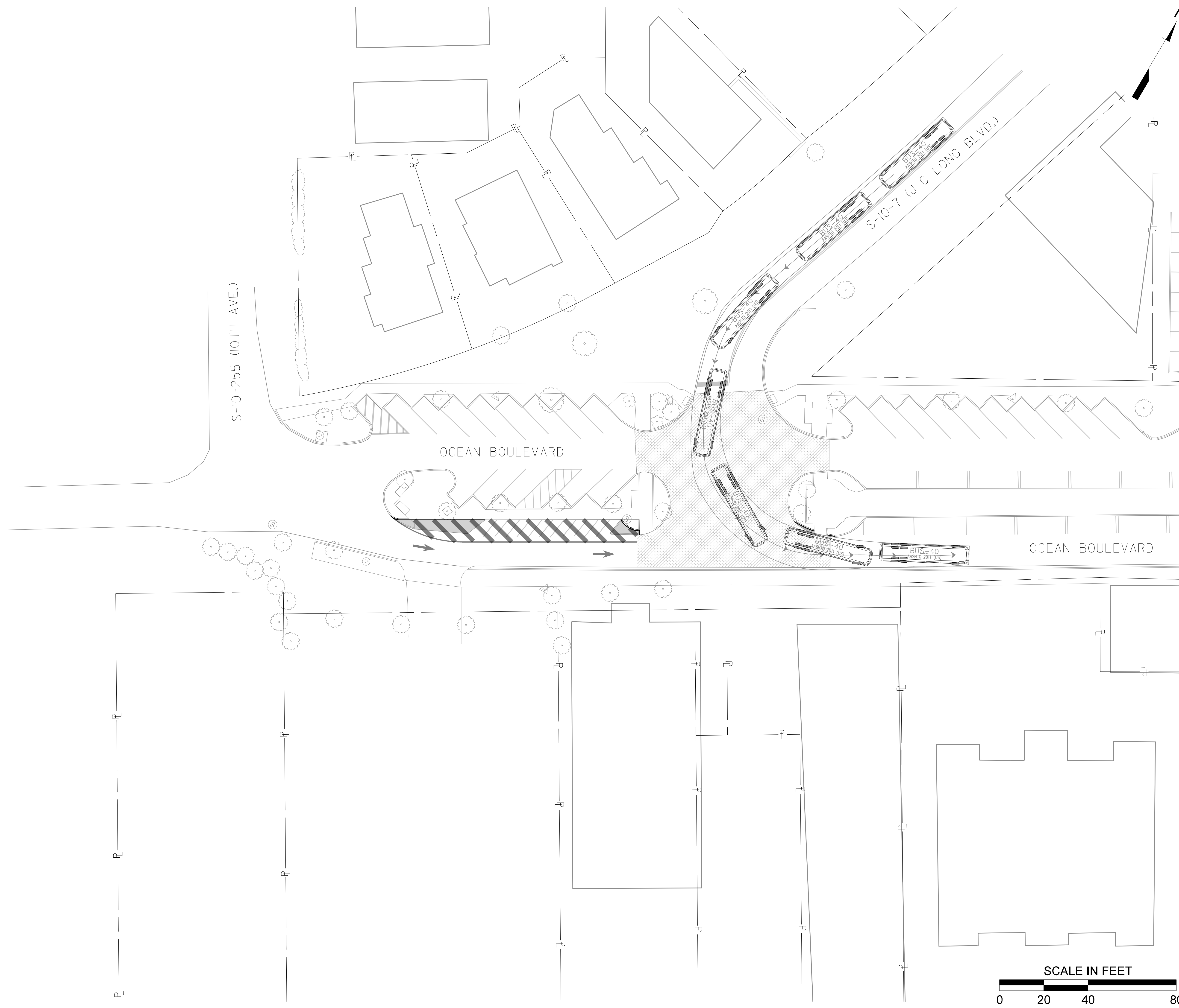
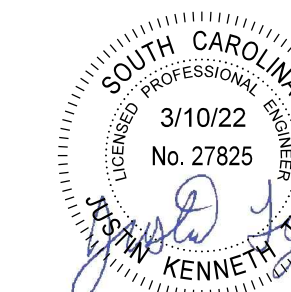
3 PAVEMENT MARKING DETAILS  
3 N.T.S.













# Proposal



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Site Development – Asphalt Paving – Dock & Marine

P.O. Box 32219 / Charleston, S.C. 29417-2219 Fax: 843-766-5574

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PROPOSAL SUBMITTED TO City of Isle of Palms – Douglas Kerr		PHONE 843-886-9912	DATE 3-30-22
STREET PO Drawer 508		JOB NAME 1008 Ocean Blvd.	
CITY, STATE AND ZIP CODE IOP, SC 29451		JOB LOCATION 1008 Ocean Blvd., IOP	
ENGINEER Stantec	DATE OF PLANS 3-10-22	<a href="mailto:dkerr@iop.net">dkerr@iop.net</a>	JOB PHONE 843-886-9912

We hereby submit specifications and estimates for:

Price for mobilization, traffic control (daytime), and demo per Stantec plans dated 3-10-22 (Project # 171002476) and install new concrete curb/pavement, full-depth asphalt, and thermo striping

1 LUMP SUM TOTAL: \$22,431.00

*We Propose*

hereby to furnish material and labor - complete in accordance with above specifications, for the sum of: dollars (\$22,431.00 ).

This estimated offer in proposal form is based on executing an AIA contract and is limited to the Scope of Work listed above. This Proposal shall be an integral part of any contract, purchase order, or work order accepted by the undersigned.

Authorization by Owner or Contractor to begin work on this project prior to their executing this contract constitutes an acceptance of the terms of this contract and/or explicit agreement to execute an Unmodified AIA contract for this work in lieu of executing this Proposal.

Authorized  
Signature \_\_\_\_\_

Note: This proposal is subject to change after 30 days from the date shown above.

*Acceptance of Proposal* - The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment terms are Net 30.

Signature \_\_\_\_\_

Signature \_\_\_\_\_

Date of Acceptance : \_\_\_\_\_

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## Sec. 5-4-12. Additional regulations.

The following additional regulations shall apply to all zoning districts:

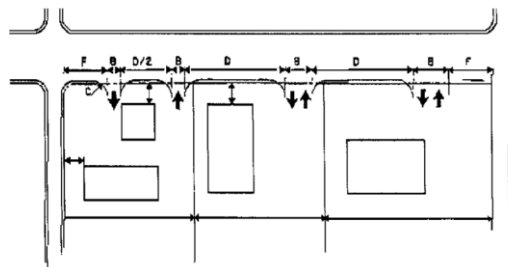
- (a) No land or building shall hereafter be used or occupied and no building or part thereof shall be constructed, erected, altered, or moved unless done in compliance with all applicable provisions of this chapter. Any use of land or buildings which is not allowed as a permitted use, conditional use, or special exception in the applicable zoning district is strictly prohibited.
- (b) The height of a building or structure shall not exceed forty feet (40'), unless otherwise provided in this chapter.
- (c) No lot shall be reduced to a size which does not meet the minimum lot area, lot width, yard areas, or other requirements of the applicable zoning district.
- (d) Except as provided in sections 5-4-45 and 5-4-46, no buildings shall be erected, altered or moved to create smaller front yards, side yards, rear yards or other open spaces than are required by the applicable zoning district.
- (e) All new construction or substantial improvements, as those terms are defined in section 5-4-155, shall be connected to the public sewer system if a public sewer line abuts a property or could abut a property with an extension of the sewer line of one hundred fifty (150) feet or less, as determined by the Isle of Palms Water and Sewer Commission. Where a gravity operated public sewer line does not abut a property or would require an extension of the sewer line of more than one hundred fifty (150) feet to reach a property, all new construction or substantial improvements must have an on-site wastewater disposal system or grinder pump system constructed or brought into compliance with current South Carolina Department of Health and Environmental Control (SCDHEC) standards; provided, however, that if the property cannot meet current SCDHEC on-site wastewater disposal system or grinder pump system standards, the building on such property shall not be increased in size and the improvements shall not increase the number of bedrooms or bathrooms.
- (f) Sills, belt course, window air conditioning units, chimneys and cornices may project into a required yard by not more than two feet (2'). Steps may project into a required front yard or rear yard by not more than five feet (5').
- (g) The zoning district front yard setback requirements for dwellings shall not apply to any lot where the average setback of existing buildings located within one hundred feet (100') of each side of the dwelling within the same block and fronting on the same street is less than the required front yard setback. In such case the average setback on such lot shall not be less than the average setback of the existing buildings.
- (h) Where a lot abuts on two (2) streets (either a corner lot or a double frontage lot), the lot's front yard setback requirements must be met on both street sides and the lot's side yard setback requirements must be met on all other sides of the lot.
- (i) Where a lot abuts on two (2) streets or rights-of-way (either a corner lot or a double frontage lot), no accessory building shall be located closer to a street than the lot's front yard setback requirements.
- (j) No fence, wall, shrubbery, or other structure shall obstruct road traffic vision.
- (k) Every building hereinafter erected or moved shall be on a lot abutting a public street, or having legal access to an approved private street. All structures shall be located to allow for safe and convenient access for servicing, fire protection, and off-street parking.
- (l) All lots shall be located on a street having a minimum right-of-way of fifty feet (50'). The required fifty feet (50') shall not include any critical area as defined in section 5-4-15(A).

- (m) Except as allowed in section 5-4-113(g), no access drive shall be permitted which would require a reduction in existing on-street public parking or loading areas.
- (n) Except in residential and GC-2 zoning districts, access drives shall conform to the requirements set forth in the following table and figure 5-4-12-A:

Street Speed Limit (mph)	Maximum One-Way/Two-Way Drive Width (in feet)	Minimum Radius (in feet)	Minimum Spacing Between All Access Drives* (in feet)	Minimum Spacing Between All Drives and Intersections (in feet)
≤20	12/24	15	30	50
25	15/30	15	40	50
30	15/30	20	50	50
35	18/36	20	50	50
40	20/40	25	50	50

\*The distance between abutting one-way access drives, with the inbound drive located upstream of the traffic flow from the outbound drive, can be one-half of the distance listed above.

**Figure 5-4-12-A**



B = Access Drive Width

C = Curb Radius

D = Access Drive Separation

E = Fifty (50) Foot Minimum Spacing From Right-of-Way

- (o) Access drives in the GC-2 zoning district authorized pursuant to section 5-4-113(g) must comply with the following requirements:
  1. There shall be only one (1) access drive per lot.
  2. An access drive shall not exceed twenty-four feet (24') in width.
  3. Prior to constructing an access drive from a State right-of-way, the owner of the property first must obtain an encroachment permit from the South Carolina Department of Transportation (SCDOT). All fees, costs and expenses for obtaining the permit and for construction of the access drive, arrangement for the sight distance requirement, and any other requirements of SCDOT shall be borne by the owner of the property.

- 
4. Prior to constructing an access drive from a City or County right-of-way, the owner of the property first must obtain an encroachment permit as set forth in title 3, chapter 1, article E. All fees, costs and expenses for construction of the access drive, compliance with the sight distance requirement, and any other requirements shall be borne by the owner of the property.
- (p) Adding fill or importation of materials of any type, or re-contouring of a lot's existing contours, that increases a lot's existing ground elevation more than one (1) foot above existing road and results or may result in elevating an existing or proposed structure is strictly prohibited.
- (q) Any decrease in a lot's existing ground elevation is strictly prohibited.
- (r) No lot shall be graded or filled to an elevation that results in a change to the existing stormwater runoff for such lot without the Zoning Administrator's prior approval of a stormwater management plan. The stormwater management plan shall include the stamp and signature of a duly licensed and qualified professional, all existing and proposed topographical features of the lot, existing and proposed drainage flow patterns, and a statement by the professional certifying that the filling or grading of the lot will not adversely impact the drainage of any adjacent properties, drainage systems or rights-of-way. The following site changes shall require the submittal of a stormwater management plan:
- (1) Any new building construction, new impervious surface, or replacement of impervious surfaces, which cumulatively exceed six hundred and twenty-five (625) square feet in area (all development shall be cumulative over time when considering the square footage threshold for requiring a stormwater management plan);
- (2) Adding fill or re-contouring of twenty (20) percent or more of the existing lot area in compliance with paragraph (p) of this section.

Additional submittal materials, design specifications and maintenance schedules may be requested at the discretion of the Zoning Administrator to ensure compliance with the Charleston County Stormwater Management Program.

(Code 1994, § 5-4-12; Ord. No. 2001-5, §§ 1—3, 5-22-2001; Ord. No. 2002-12, § 1, 10-22-2002; Ord. No. 2003-8, § 1, 6-24-2003; Ord. No. 2003-13, § 1, 2-24-2004; Ord. No. 2006-10, § 1, 8-22-2006; Ord. No. 2015-11, § 1, 9-29-2015; Ord. No. 2018-13, §§ 2, 3, 8-28-2018; Ord. No. 2017-09, § 2, 8-27-2019)

**RESOLUTION NO. R-2022-\_\_\_**  
**A RESOLUTION TO SUPPORT CLIMATE CHANGE ACTION**

**WHEREAS**, there is scientific consensus regarding the reality of climate change and the recognition that human activity, especially the combustion of fossil fuels that create greenhouse gases, exacerbated by unsustainable land use and development, is a key driver of climate change; and,

**WHEREAS**, our present climate crisis is widely recognized by government, business, academic, religious, and other community leaders as a clear immediate and long-term threat to the well-being of all communities, including the City of Isle of Palms and its vulnerable populations; and,

**WHEREAS**, if left unchecked, climate change will produce significant sea-level rise, flooding, more frequent heatwaves, droughts, wildfires, increasingly severe health impacts, food and water shortages, mass loss of local land and ocean biodiversity, and more severe and frequent extreme hurricanes that threaten the City of Isle of Palms and all surrounding governmental jurisdictions; and,

**WHEREAS**, without proper planning, the adverse impacts of climate change could exhaust and destabilize our infrastructure and emergency and social services; negatively impact our access to food, water, and energy; and disrupt commerce, local businesses, property, and our quality of life; and,

**WHEREAS**, the City of Isle of Palms has been proactive in the face of a changing climate, including creating the Environmental Advisory Committee, being the first in the State to adopt an ordinance to reduce the use of plastic bags, and adding limits on the amount of allowable impervious surfacing.

**NOW, THEREFORE, BE IT RESOLVED** by the Mayor and Council this \_\_\_ Day of \_\_\_\_, 2022 that the City of Isle of Palms, South Carolina supports - private and public solutions to address the causes and effects of measured changes to our global and regional climates, including needed changes in human activities that have been found to have a negative impact, and;

**BE IT FURTHER RESOLVED** that the City encourages all residents to conserve and protect our natural environment by increasing their use of solar and other renewable energy, planting trees and other carbon absorbing vegetation, bio-retention of stormwater, and to reduce our carbon footprint, and commits to providing appropriate educational resources to aid the efforts of our citizens, and;

**BE IT FURTHER RESOLVED** that the City will advocate for climate solutions on the County and State level, and;

**BE IT FURTHER RESOLVED** that the City will continue to implement forward-looking floodplain and stormwater regulations, improve and add to the sidewalk and bikeway network, protect and improve greenspace and parks, including the planting of trees, and continue to plan and prepare for the consequences of global climate change including likely increases in sea level and increased intensity of tropical storms, and explore developing a Climate Action Plan.

---

Phillip Pounds, Mayor





DO NOT  
ENTER

Wild  
Dunes  
RESORT & SPA







PO Box 99  
Ridgeville, SC 29472  
[hoyt@divadenterprisesllc.com](mailto:hoyt@divadenterprisesllc.com)  
[dawn@divadenterprisesllc.com](mailto:dawn@divadenterprisesllc.com)  
[kerine@divadenterprisesllc.com](mailto:kerine@divadenterprisesllc.com)

February 25, 2022

ATTN: Robert Asero, Assistant Director; IOP Department of Public Works

**Billing Info.**

IOP Department of Public Works

1303 Palm Blvd.

Isle of Palms, SC 29451

ATTN: Robert Asero

[RAsero@iop.net](mailto:RAsero@iop.net)

**Re: 46<sup>th</sup> & Palm Blvd. 1.5" Mill & Overlay Edge**

Mill 1.5" of Edge of Asphalt, approximately 111SY, and Overlay 2" Surface Type Asphalt. Labor, equipment materials and traffic control.

**TOTAL = \$12,000.00**

Thank you for the opportunity to submit this proposal. If you have any questions, please contact either Hoyt Mullins at 843-860-6007 ([hoyt@divadenterprisesllc.com](mailto:hoyt@divadenterprisesllc.com)), Dawn Eadie at 843-297-2301 ([dawn@divadenterprisesllc.com](mailto:dawn@divadenterprisesllc.com)), or Kerine Borrillo at 843-200-2687 [Kerine@divadenterprisesllc.com](mailto:Kerine@divadenterprisesllc.com) .

Sincerely,

*Kerine Borrillo*

Assistant General Manager

INTEREST ON LATE PAYMENTS. Late payments shall draw interest at the rate of 1.5% per month from the due date. Accrued interest is immediately due and payable and interest shall accrue on unpaid at the rate of 1.5% per month until paid in full. Interest will accrue on any judgment obtained by Eadie's Diva D Enterprises, LLC for payment and interest due at the rate of 18% per annum. Any payments received shall be applied first to the reduction of interest then to principal.

ATTORNEY FEE AND COSTS. Purchaser will pay all costs and expenses incurred by Eadie's Diva D Enterprises, LLC in collecting any unpaid past due amounts from Purchaser hereunder, to include but not limited to court costs, all other expenses, incurred by Eadie's Diva D Enterprises, LLC in litigation, a reasonable attorney fee, and in the event of litigation, to be handled in Dorchester County. The aggregate amount of all fees and expenses for which Eadie's Diva D Enterprises, LLC is entitled to reimbursement shall be added to, and become a part of any judgment entered against Purchaser and in favor of Eadie's Diva D Enterprises, LLC.

---

Signature

Date

# Proposal



Charleston, SC Since 1936

# Truluck Construction, Inc.

Site Development – Asphalt Paving – Dock & Marine

P.O. Box 32219 / Charleston, S.C. 29417-2219 Fax: 843-766-5574

1012A St. Andrews Blvd / Charleston, S.C. 29407 / 843-766-5571



PROPOSAL SUBMITTED TO City of Isle of Palms – Douglas Kerr		PHONE 843-886-9912	DATE 3-30-22
STREET PO Drawer 508		JOB NAME Palm Blvd. at 46 <sup>th</sup>	
CITY, STATE AND ZIP CODE IOP, SC 29451		JOB LOCATION Palm Blvd. at 46 <sup>th</sup> , IOP	
ENGINEER	DATE OF PLANS N/A	<a href="mailto:dkerr@iop.net">dkerr@iop.net</a>	JOB PHONE 843-886-9912

We hereby submit specifications and estimates for:

Price for mobilization, traffic control (daytime), mill, tack, and overlay with 2” Type C Asphalt Surface

TOTAL: \$16,569.00

*We Propose* hereby to furnish material and labor - complete in accordance with above specifications, for the sum of: \_\_\_\_\_ dollars (\$16,569.00 ).

This estimated offer in proposal form is based on executing an AIA contract and is limited to the Scope of Work listed above. This Proposal shall be an integral part of any contract, purchase order, or work order accepted by the undersigned.

Authorization by Owner or Contractor to begin work on this project prior to their executing this contract constitutes an acceptance of the terms of this contract and/or explicit agreement to execute an Unmodified AIA contract for this work in lieu of executing this Proposal.

Authorized Signature \_\_\_\_\_

Note: This proposal is subject to change after 30 days from the date shown above.

*Acceptance of Proposal* - The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment terms are Net 30.

Signature \_\_\_\_\_

Signature \_\_\_\_\_

Date of Acceptance : \_\_\_\_\_



F:\27670\27670-0007-ENGINEERING\DRAWINGS\CONSTRUCTION PLANS\CONCEPT PLAN.DWG - 3/15/2022 - 9:44 AM



NO.	REVISIONS	BY	DATE

NO.	REVISIONS	BY	DATE

**THOMAS & HUTTON**  
 682 Johnnie Dodds Blvd. • Suite 100  
 Mt. Pleasant, SC 29464 • 843.849.0200  
 www.thomasandhutton.com

**CITY OF ISLE OF PALMS**  
 ISLE OF PALMS, SOUTH CAROLINA  
**25TH AVENUE DRAINAGE**  
**CONCEPT PLAN**

JOB NO:	J-27670.0007
DATE:	3/15/2022
DRAWN:	HEA
DESIGNED:	HEA
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	1" = 10'

**C1.1**

# THOMAS & HUTTON

682 JOHNNIE DODDS BLVD., SUITE 100 | MOUNT PLEASANT, SC 29464  
POST OFFICE BOX 1522 | MOUNT PLEASANT, SC 29465-1522  
843.849.0200 | WWW.THOMASANDHUTTON.COM

## MEMORANDUM

**TO:** South Carolina Department of Transportation

**FROM:** Hillary Aton, PE  
Thomas & Hutton

**DATE:** March 25, 2022

**SUBJECT:** 25<sup>th</sup> Avenue Flood Protection

**T&H JOB NO.:** 27670.0007

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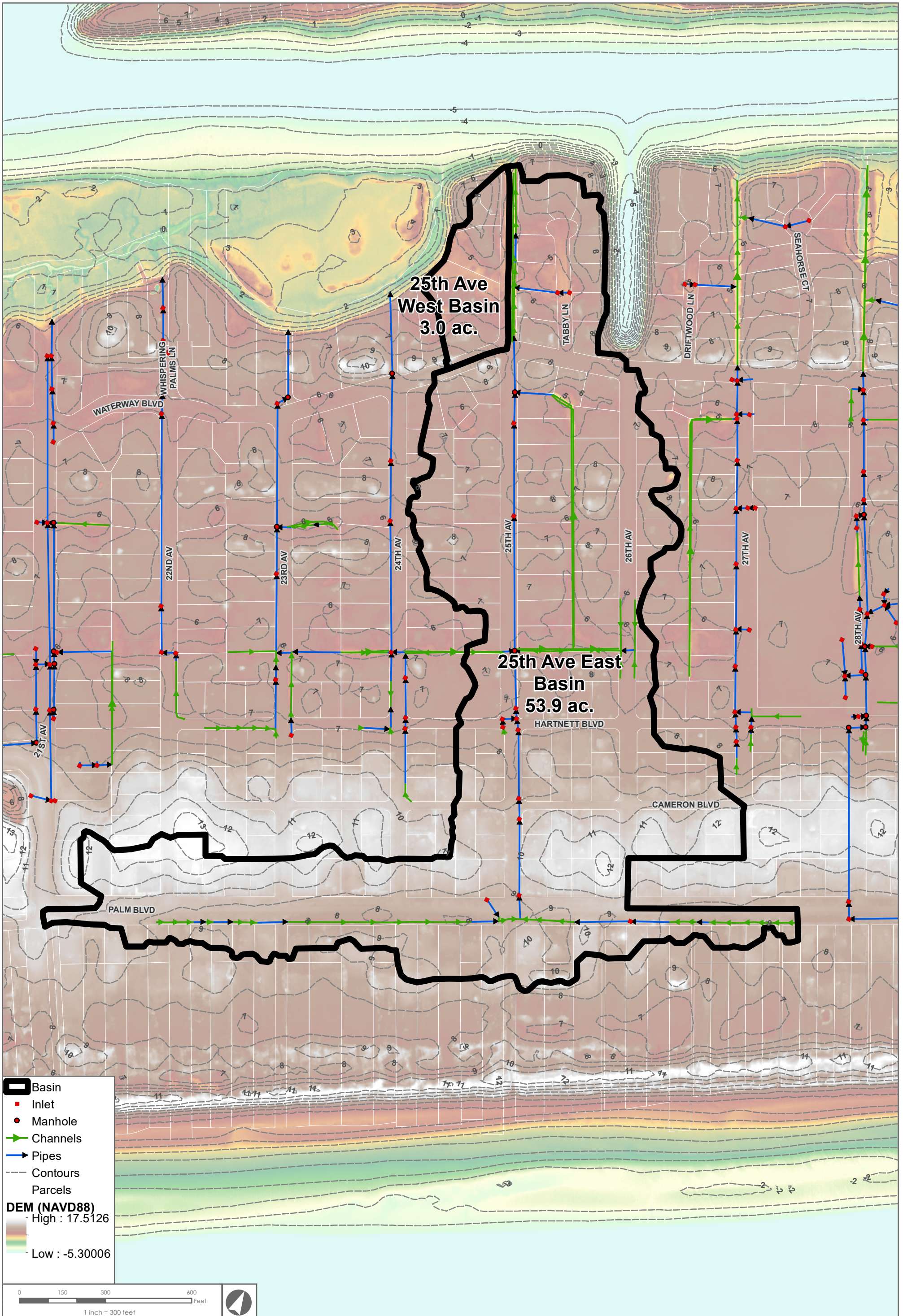
This memo documents the hydrologic and hydraulic analysis of the 25<sup>th</sup> Avenue Drainage. The attached Exhibit illustrates the drainage basins for the outfall ditch along the west side of 25<sup>th</sup> Avenue (25<sup>th</sup> Avenue West Basin) and the outfall ditch along the east side of 25<sup>th</sup> Avenue (25<sup>th</sup> Avenue East Basin). The two drainage basins are 3.0 acres and 53.9 acres respectively.

Per the SCDOT Requirements for Hydraulic Design Studies, stormwater drainage systems that drain less than 40 acres shall be designed to carry flows resulting from a 10-year storm event and systems that drain between 40 and 100 acres shall be designed to carry flow resulting from a 25-year storm event. The attached Hydrologic and Hydraulic Design Summary provides the input and results of the pipe sizing calculations for the two drainage basins. A MHW elevation of 2.6 was used for the tailwater condition.

HY-8 models were prepared for both the east and west basin outfalls and the model results are presented in the summary table mentioned above. The modeling resulted in a single 24" pipe for the west basin outfall and dual 36" pipes for the east basin outfall. HY-8 reports are included as attachments.

Also included as part of this memo is the tidal data that was collected and analyzed. The tidal data was exported from NOAA's website for Tidal Station 8665530 located in the Charleston Harbor. The data is referenced to vertical datum NAVD88. The tidal analysis shows that 25<sup>th</sup> Avenue, with a lowest point centerline elevation of 3.95, experienced tidal flooding 31 times in 2021. Data is provided for years dating back to 2018, which also indicate a significant number of tidal flooding events each year.





Basin  
■ Inlet  
● Manhole  
→ Channels  
→ Pipes  
 --- Contours  
 --- Parcels  
**DEM (NAVD88)**  
 High : 17.5126  
 Low : -5.30006



Job Number: 27670.0007	Produced: 3/15/22	Produced By: HEA	Modified: 3/15/2022	Modified By:
File: Z:\27670\27670.0007\GIS\Map\Drainage Exhibit.mxd				Vertical Datum:
Thomas & Hutton compiled the map information from the following sources:				
Date	Source	Date		
Basins	T&H	2022		
Inlets/Manholes/Channels/Pipes	Charleston County	2015		
Contours	Charleston County	2017		
DEM	Charleston County	2017		
<small>DISCLAIMER: Where Thomas &amp; Hutton is cited as the data source, the firm has created or verified the data. For all other sources cited, Thomas &amp; Hutton used the data "as is" and 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.          Copyright © 2015 by Thomas &amp; Hutton          No part of this document may be reproduced without written permission from an officer of Thomas &amp; Hutton.</small>				

## 25th Avenue

Isle of Palms, South Carolina

### Drainage Basin Exhibit



682 JOHNNIE DODDS BLVD • SUITE 100  
 MT. PLEASANT, SC 29464 • 843.849.0200  
 WWW.THOMASANDHUTTON.COM

GEOGRAPHIC INFORMATION SYSTEMS

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**Isle of Palms 25th Avenue Drainage Improvements**

**Hydrologic and Hydraulic Design Summary**

Culvert									Design Storm*	Tailwater	Proposed Culvert Size	# of Barrels	Invert Elevation Up	Invert Elevation Down	25th Avenue CL El.	Design Storm HW Elevation	Freeboard
	A_Total	A_Total	Runoff Coeff. C	Time of Conc. Tc	i_Design	Q_Design	i_100	Q_100									
	(ac)	(Sq. mi.)	-	(min)	(in)	(cfs)	(in)	(cfs)			(in)						(ft)
25th Ave West	3	0.00	0.3	11	6.97	6	9.29	8	10-yr	2.6 (MHW)	24"	1	0	0	4.2	2.72	1.5
25th Ave East	53.9	0.08	0.3	43	4.10	66	5.10	83	25-yr	2.6 (MHW)	Dual 36"	2	0	0	4.2	3.39	0.8

\*10-year design storm for roadside ditches with drainage areas from 0 to 40 acres

25-year design storm for roadside ditches with drainage areas 40 to 500 acres

Charleston County Rainfall Intensity Values (SCDOT):

10-Year		25-Year		50-Year		100-Year	
a	55.13	a	45.53	a	42.68	a	39.53
b	8.412	b	6.257	b	5.28	b	4.297
c	0.6972	c	0.6179	c	0.5741	c	0.5309

## Existing Conditions - Internal Drainage



PROJECT: **Isle of Palms 25th Avenue Drainage Improvements**  
 LOCATION: **Isle of Palms, SC**  
 PREPARED FOR: **City of Isle of Palms, SC**

Job: **J-27670.0007**  
 Date: **3/15/22**  
 Revised: **3/15/22**  
 By: **HEA**

### DRAINAGE BASIN 25th Avenue West DRAINAGE BASIN 25th Avenue West

#### Calculate Existing "Tc"

"EX"

#### Calculate Time of Concentration:

Use Travel Time Concept:

#### Overland Sheet Flow:

$$t = (0.007(nl)^{0.8}) / ((P2^{0.5})(S^{0.4}))$$

where: t = Travel time for Overland Flow (min)

n = Manning's coefficient - from TR-55

l = Length of flow (ft)

P2 = 2-yr rainfall depth (in)

S = Hydraulic slope (ft/ft)

$$n = \text{Grass: Short} = 0.150$$

$$l = 100 \text{ ft}$$

$$P2 = 4.60 \text{ in}$$

$$S = 0.0300 \text{ ft/ft}$$

$$t_1 = 6.9 \text{ min}$$

#### Shallow Concentrated Flow:

$$t = l/60v$$

where

$$l = 45 \text{ ft}$$

$$\text{Paved? No}$$

$$\text{Slope, } S = 0.0300 \text{ ft/ft}$$

$$v = 2.79 \text{ ft/s}$$

$$t_2 = 0.3 \text{ min}$$

$$\text{25th Avenue West: } T_c = 11.0 \text{ min}$$

#### Channel Flow: $t = l/60v$

where: t = Travel time for Pipe Flow (min)

l = Length of flow (ft)

S = Average watercourse slope (ft/ft)

n = Manning's Coefficient for Channel Flow

A = Cross-Sectional Area (ft<sup>2</sup>)

P = Wetted Perimeter (ft)

R = Hydraulic Radius (ft)

v = Velocity (ft/s) - From TR-55

$$l =$$

$$S = 0.0080 \text{ ft/ft}$$

$$n = \text{Earth, uniform, short grass} = 0.0250$$

$$A =$$

$$P = \Rightarrow \text{Hydraulic Radius, } R = n/a$$

$$v = n/a$$

$$t_3 = n/a$$

#### Pipe Flow/Channel: $t = l/60v$

$$l = 510 \text{ ft}$$

$$v = 2.00 \text{ ft/s}$$

$$t = 4.3 \text{ min}$$

### DRAINAGE BASIN 25th Avenue East DRAINAGE BASIN 25th Avenue East

#### Calculate Existing "Tc"

"EX"

#### Calculate Time of Concentration:

Use Travel Time Concept:

#### Overland Sheet Flow:

$$t = (0.007(nl)^{0.8}) / ((P2^{0.5})(S^{0.4}))$$

where: t = Travel time for Overland Flow (min)

n = Manning's coefficient - from TR-55

l = Length of flow (ft)

P2 = 2-yr rainfall depth (in)

S = Hydraulic slope (ft/ft)

$$n = \text{Grass: Short} = 0.150$$

$$l = 100 \text{ ft}$$

$$P2 = 4.60 \text{ in}$$

$$S = 0.0120 \text{ ft/ft}$$

$$t_1 = 10.0 \text{ min}$$

#### Shallow Concentrated Flow:

$$t = l/60v$$

where

$$l = 33 \text{ ft}$$

$$\text{Paved? No}$$

$$\text{Slope, } S = 0.0120 \text{ ft/ft}$$

$$v = 1.77 \text{ ft/s}$$

$$t_2 = 0.3 \text{ min}$$

$$\text{25th Avenue East: } T_c = 43.0 \text{ min}$$

#### Channel Flow: $t = l/60v$

where: t = Travel time for Pipe Flow (min)

l = Length of flow (ft)

S = Average watercourse slope (ft/ft)

n = Manning's Coefficient for Channel Flow

A = Cross-Sectional Area (ft<sup>2</sup>)

P = Wetted Perimeter (ft)

R = Hydraulic Radius (ft)

v = Velocity (ft/s) - From TR-55

$$l =$$

$$S = 0.0080 \text{ ft/ft}$$

$$n = \text{Earth, uniform, short grass} = 0.0250$$

$$A =$$

$$P = \Rightarrow \text{Hydraulic Radius, } R = n/a$$

$$v = n/a$$

$$t_3 = n/a$$

#### Pipe Flow/Channel: $t = l/60v$

$$l = 3886 \text{ ft}$$

$$v = 2.00 \text{ ft/s}$$

$$t = 32.4 \text{ min}$$

# 25th Avenue West

## HY-8 Culvert Analysis Report

### Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 6 cfs

Maximum Flow: 8 cfs

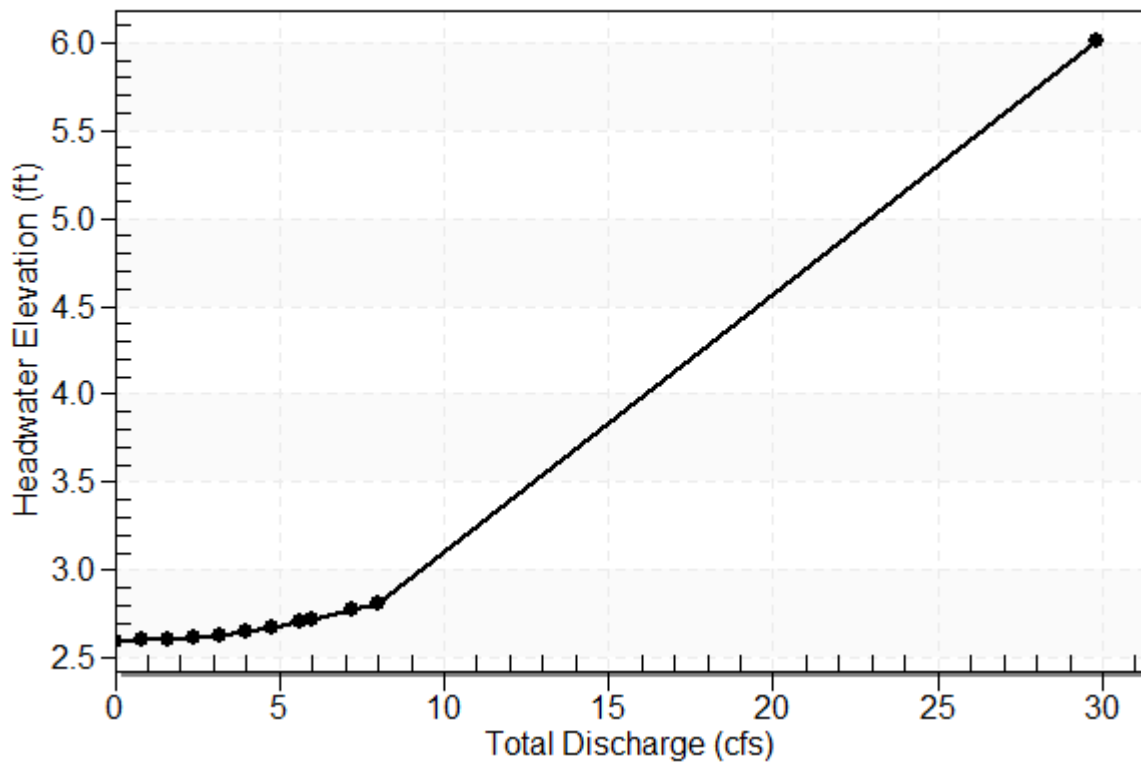
**Table 1 - Summary of Culvert Flows at Crossing: 25th Avenue West**

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
2.60	0.00	0.00	0.00	1
2.60	0.80	0.80	0.00	1
2.61	1.60	1.60	0.00	1
2.62	2.40	2.40	0.00	1
2.63	3.20	3.20	0.00	1
2.65	4.00	4.00	0.00	1
2.68	4.80	4.80	0.00	1
2.70	5.60	5.60	0.00	1
2.72	6.00	6.00	0.00	1
2.77	7.20	7.20	0.00	1
2.81	8.00	8.00	0.00	1
6.00	29.29	29.29	0.00	Overtopping

# Rating Curve Plot for Crossing: 25th Avenue West

## Total Rating Curve

Crossing: 25th Avenue West





**Table 2 - Culvert Summary Table: Culvert 1**

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2.60	0.000	2.600	0-NF	0.000	0.000	2.000	2.600	0.000	0.000
0.80	0.80	2.60	0.451	2.602	4-FFf	-1.000	0.307	2.000	2.600	0.255	0.000
1.60	1.60	2.61	0.646	2.609	4-FFf	-1.000	0.438	2.000	2.600	0.509	0.000
2.40	2.40	2.62	0.799	2.619	4-FFf	-1.000	0.539	2.000	2.600	0.764	0.000
3.20	3.20	2.63	0.931	2.634	4-FFf	-1.000	0.625	2.000	2.600	1.019	0.000
4.00	4.00	2.65	1.051	2.653	4-FFf	-1.000	0.701	2.000	2.600	1.273	0.000
4.80	4.80	2.68	1.164	2.677	4-FFf	-1.000	0.771	2.000	2.600	1.528	0.000
5.60	5.60	2.70	1.272	2.704	4-FFf	-1.000	0.835	2.000	2.600	1.783	0.000
6.00	6.00	2.72	1.325	2.720	4-FFf	-1.000	0.866	2.000	2.600	1.910	0.000
7.20	7.20	2.77	1.480	2.772	4-FFf	-1.000	0.953	2.000	2.600	2.292	0.000
8.00	8.00	2.81	1.581	2.813	4-FFf	-1.000	1.007	2.000	2.600	2.546	0.000

\*\*\*\*\*

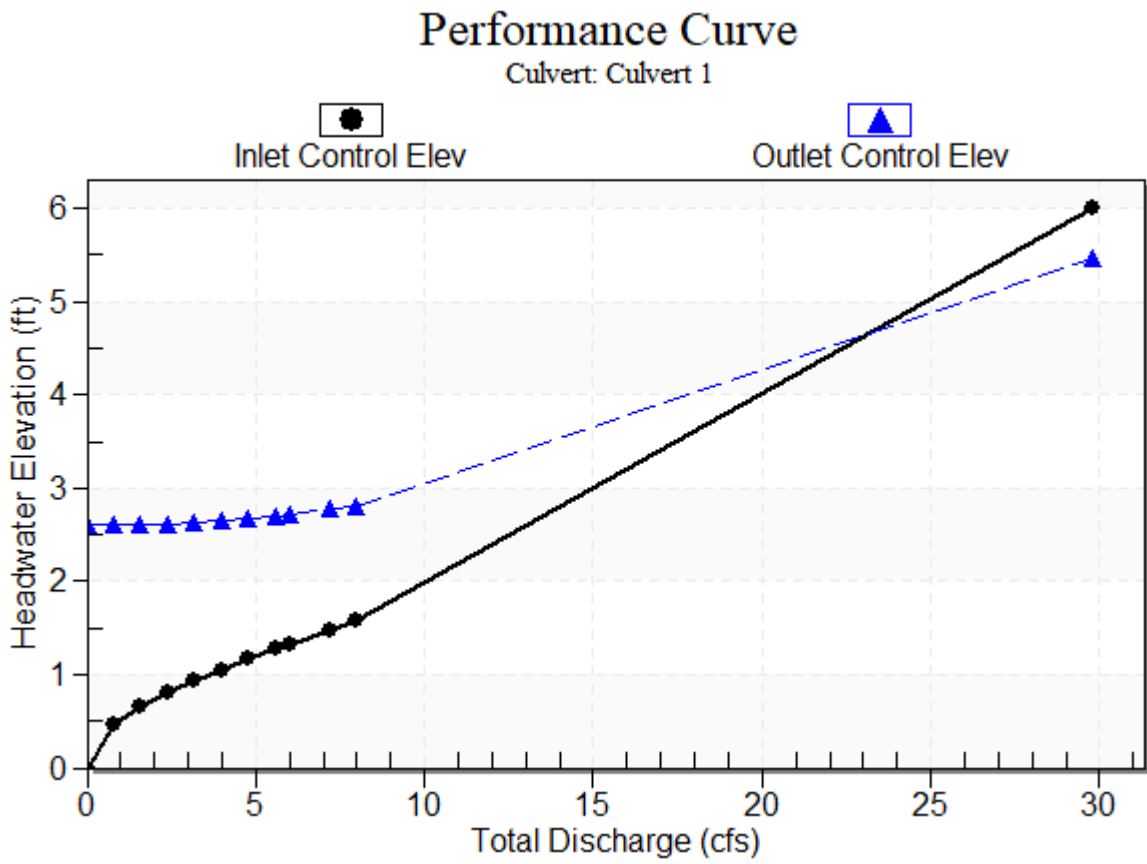
Straight Culvert

Inlet Elevation (invert): 0.00 ft, Outlet Elevation (invert): 0.00 ft

Culvert Length: 20.00 ft, Culvert Slope: 0.0000

\*\*\*\*\*

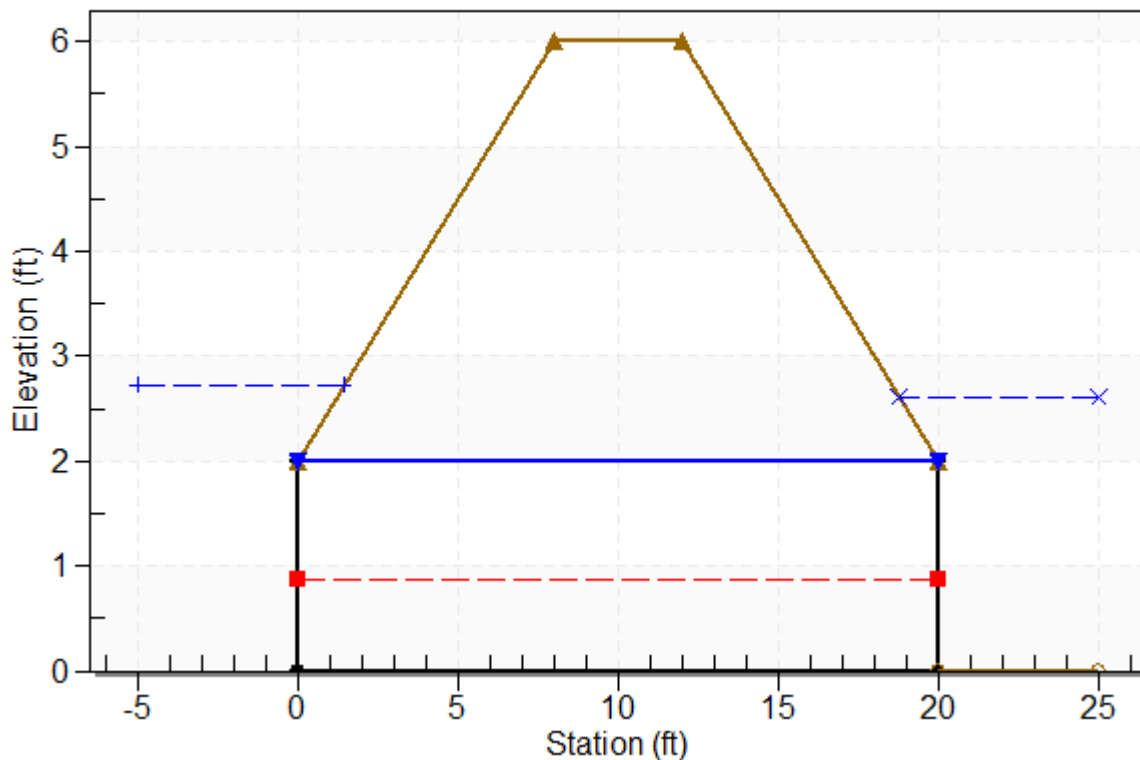
### Culvert Performance Curve Plot: Culvert 1



## Water Surface Profile Plot for Culvert: Culvert 1

### Crossing - 25th Avenue West, Design Discharge - 6.0 cfs

Culvert - Culvert 1, Culvert Discharge - 6.0 cfs



### Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 0.00 ft

Outlet Station: 20.00 ft

Outlet Elevation: 0.00 ft

Number of Barrels: 1

### Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Smooth HDPE

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Thin Edge Projecting

Inlet Depression: None

**Table 3 - Downstream Channel Rating Curve (Crossing: 25th Avenue West)**

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
0.00	2.60	2.60
0.80	2.60	2.60
1.60	2.60	2.60
2.40	2.60	2.60
3.20	2.60	2.60
4.00	2.60	2.60
4.80	2.60	2.60
5.60	2.60	2.60
6.00	2.60	2.60
7.20	2.60	2.60
8.00	2.60	2.60

### **Tailwater Channel Data - 25th Avenue West**

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 2.60 ft

### **Roadway Data for Crossing: 25th Avenue West**

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 6.00 ft

Roadway Surface: Gravel

Roadway Top Width: 4.00 ft

# 25th Avenue West

## HY-8 Culvert Analysis Report

### Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 6 cfs

Maximum Flow: 8 cfs

**Table 1 - Summary of Culvert Flows at Crossing: 25th Avenue West**

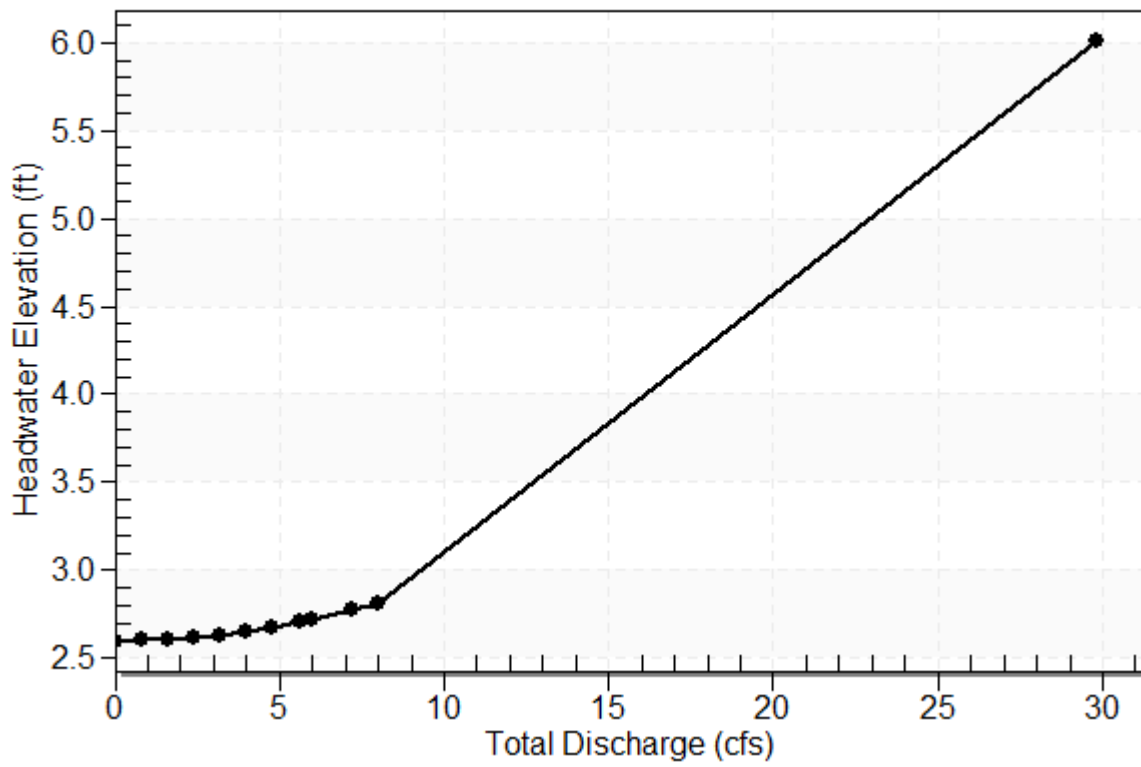
Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
2.60	0.00	0.00	0.00	1
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2.61	1.60	1.60	0.00	1
2.62	2.40	2.40	0.00	1
2.63	3.20	3.20	0.00	1
2.65	4.00	4.00	0.00	1
2.68	4.80	4.80	0.00	1
2.70	5.60	5.60	0.00	1
2.72	6.00	6.00	0.00	1
2.77	7.20	7.20	0.00	1
2.81	8.00	8.00	0.00	1
6.00	29.29	29.29	0.00	Overtopping



# Rating Curve Plot for Crossing: 25th Avenue West

## Total Rating Curve

Crossing: 25th Avenue West



**Table 2 - Culvert Summary Table: Culvert 1**

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	2.60	0.000	2.600	0-NF	0.000	0.000	2.000	2.600	0.000	0.000
0.80	0.80	2.60	0.451	2.602	4-FFf	-1.000	0.307	2.000	2.600	0.255	0.000
1.60	1.60	2.61	0.646	2.609	4-FFf	-1.000	0.438	2.000	2.600	0.509	0.000
2.40	2.40	2.62	0.799	2.619	4-FFf	-1.000	0.539	2.000	2.600	0.764	0.000
3.20	3.20	2.63	0.931	2.634	4-FFf	-1.000	0.625	2.000	2.600	1.019	0.000
4.00	4.00	2.65	1.051	2.653	4-FFf	-1.000	0.701	2.000	2.600	1.273	0.000
4.80	4.80	2.68	1.164	2.677	4-FFf	-1.000	0.771	2.000	2.600	1.528	0.000
5.60	5.60	2.70	1.272	2.704	4-FFf	-1.000	0.835	2.000	2.600	1.783	0.000
6.00	6.00	2.72	1.325	2.720	4-FFf	-1.000	0.866	2.000	2.600	1.910	0.000
7.20	7.20	2.77	1.480	2.772	4-FFf	-1.000	0.953	2.000	2.600	2.292	0.000
8.00	8.00	2.81	1.581	2.813	4-FFf	-1.000	1.007	2.000	2.600	2.546	0.000

\*\*\*\*\*

Straight Culvert

Inlet Elevation (invert): 0.00 ft, Outlet Elevation (invert): 0.00 ft

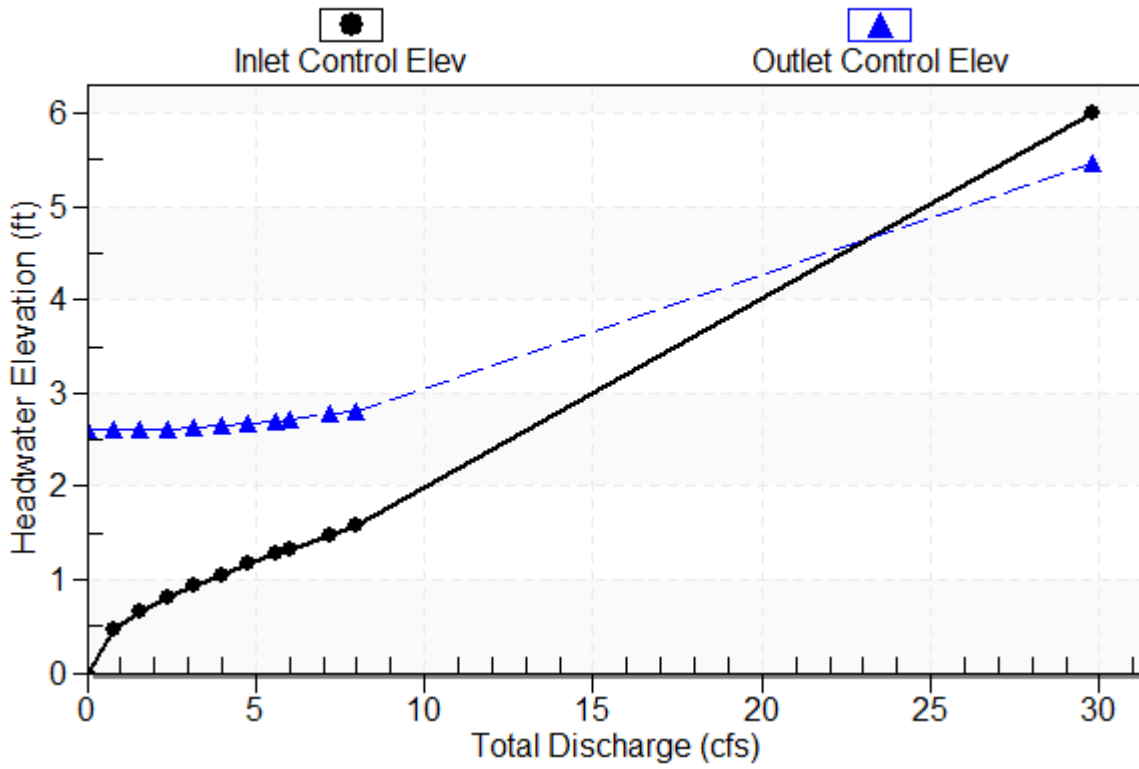
Culvert Length: 20.00 ft, Culvert Slope: 0.0000

\*\*\*\*\*

# Culvert Performance Curve Plot: Culvert 1

## Performance Curve

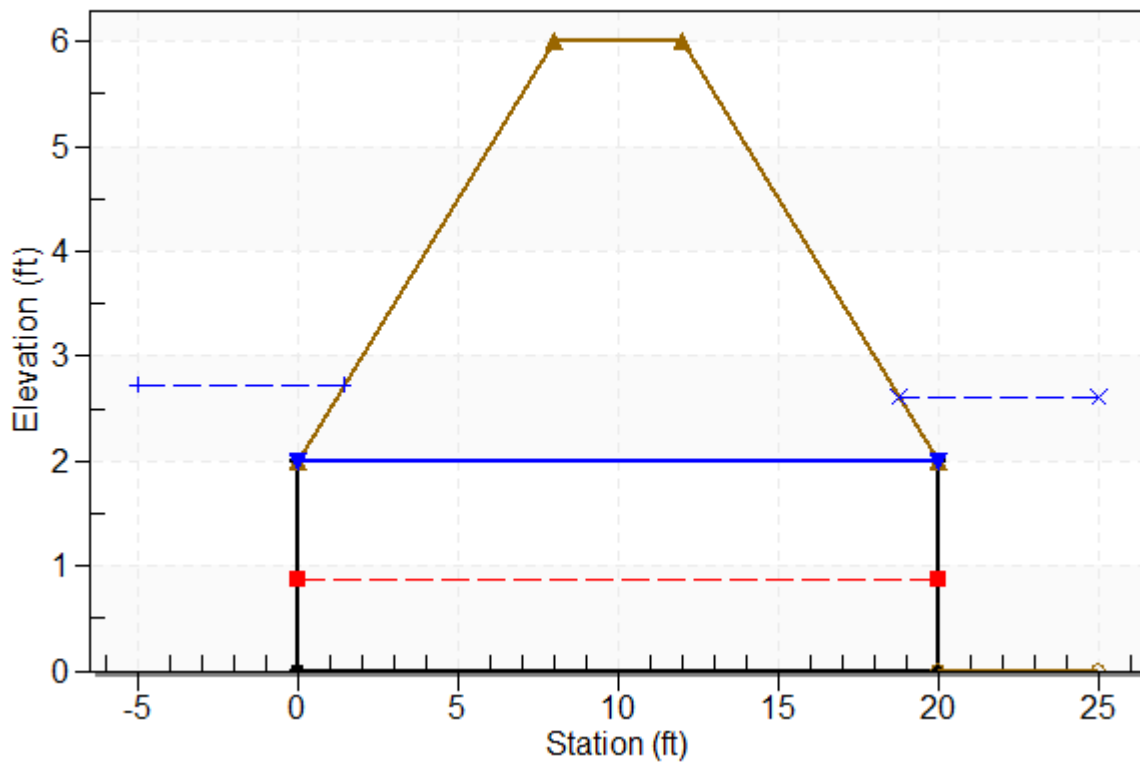
Culvert: Culvert 1



## Water Surface Profile Plot for Culvert: Culvert 1

Crossing - 25th Avenue West, Design Discharge - 6.0 cfs

Culvert - Culvert 1, Culvert Discharge - 6.0 cfs



### Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 0.00 ft

Outlet Station: 20.00 ft

Outlet Elevation: 0.00 ft

Number of Barrels: 1

### Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Smooth HDPE

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Thin Edge Projecting

Inlet Depression: None

**Table 3 - Downstream Channel Rating Curve (Crossing: 25th Avenue West)**

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
0.00	2.60	2.60
0.80	2.60	2.60
1.60	2.60	2.60
2.40	2.60	2.60
3.20	2.60	2.60
4.00	2.60	2.60
4.80	2.60	2.60
5.60	2.60	2.60
6.00	2.60	2.60
7.20	2.60	2.60
8.00	2.60	2.60

### **Tailwater Channel Data - 25th Avenue West**

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 2.60 ft

### **Roadway Data for Crossing: 25th Avenue West**

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 6.00 ft

Roadway Surface: Gravel

Roadway Top Width: 4.00 ft

Date	Time	Verified WSEL
11/24/2018	13:18	5.6
11/23/2018	13:00	5
12/9/2018	14:48	4.81
1/3/2018	13:36	4.6
11/25/2018	14:06	4.54
7/15/2018	2:18	4.46
11/26/2018	15:06	4.44
9/10/2018	0:36	4.39
7/14/2018	1:12	4.34
10/7/2018	23:36	4.3
10/9/2018	13:06	4.3
10/10/2018	13:48	4.25
10/26/2018	14:00	4.23
10/9/2018	0:30	4.22
9/8/2018	23:48	4.16
9/11/2018	1:24	4.14
1/1/2018	11:54	4.13
1/2/2018	13:00	4.13
2/28/2018	11:12	4.11
8/11/2018	0:18	4.1
10/10/2018	1:30	4.1
6/13/2018	0:00	4.07
11/24/2018	1:24	4.07
7/16/2018	3:06	4.05
9/12/2018	14:48	4.04
7/10/2018	22:24	4.02
7/11/2018	23:24	4.01
11/9/2018	14:06	4.01
9/11/2018	14:00	4
7/13/2018	0:12	3.98
8/25/2018	0:00	3.98
6/16/2018	2:24	3.97
9/12/2018	2:18	3.97
9/7/2018	22:54	3.94
2/27/2018	10:36	3.93
11/22/2018	12:00	3.93
8/12/2018	0:48	3.91
10/6/2018	22:48	3.9
6/14/2018	0:42	3.89
9/30/2018	16:24	3.88
3/7/2018	4:48	3.86
6/17/2018	3:18	3.85
12/21/2018	11:30	3.85
9/13/2018	15:48	3.84

\*All elevations are referenced to NAVD88

25th Avenue flooded 33 times in 2018.	Tabby Lane flooded 14 times during 2018.
Tabby Lane - Grate Frame Elevation 4.16	

25th Avenue C/L  
Elevation 3.95



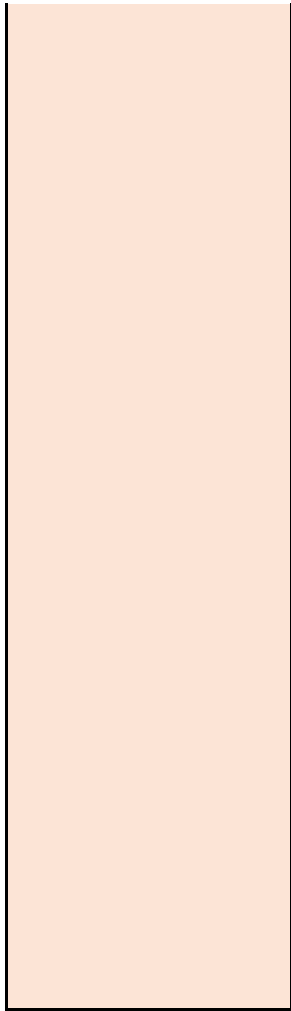
10/8/2018	12:06	3.84
1/31/2018	12:36	3.83
2/1/2018	13:36	3.83
3/5/2018	3:18	3.83
12/20/2018	10:30	3.83
3/6/2018	4:06	3.82
7/17/2018	3:42	3.8
10/11/2018	2:06	3.8
6/15/2018	1:18	3.79
12/25/2018	14:48	3.78
5/16/2018	0:48	3.77
11/27/2018	16:00	3.77
4/24/2018	7:54	3.76
9/10/2018	13:18	3.76
9/13/2018	3:24	3.75
11/8/2018	13:12	3.72
5/17/2018	1:36	3.71
9/6/2018	22:00	3.71
12/27/2018	16:48	3.67
1/4/2018	14:30	3.66
7/9/2018	21:30	3.66
8/13/2018	1:42	3.66
10/25/2018	13:12	3.66
5/18/2018	2:30	3.65
10/11/2018	14:06	3.65
11/21/2018	11:18	3.64
3/4/2018	14:54	3.63
11/6/2018	11:42	3.62
12/26/2018	15:48	3.62
3/1/2018	12:12	3.59
5/15/2018	0:06	3.59
10/5/2018	21:42	3.59
10/1/2018	17:24	3.58
11/5/2018	10:24	3.58
3/27/2018	9:18	3.57
5/19/2018	3:06	3.57
8/9/2018	23:00	3.57
3/5/2018	15:42	3.56
3/26/2018	7:54	3.56
4/1/2018	1:12	3.56
9/5/2018	20:54	3.56
12/6/2018	12:18	3.56
1/30/2018	11:30	3.55
9/25/2018	0:30	3.55
11/7/2018	12:36	3.55
11/4/2018	22:30	3.53

Date	Time	Verified WSEL
12/24/2019	11:30	4.88
2/20/2019	1:30:00 PM	4.87
9/1/2019	2:00	4.78
11/16/2019	15:24	4.69
10/1/2019	14:54	4.66
9/2/2019	2:48	4.63
11/17/2019	16:42	4.61
11/18/2019	16:54	4.58
9/2/2019	15:30	4.56
7/3/2019	0:36	4.5
7/3/2019	0:36	4.5
12/23/2019	10:30	4.49
9/27/2019	23:48	4.48
9/29/2019	0:42	4.47
10/29/2019	13:54	4.44
9/1/2019	14:36	4.43
12/25/2019	12:18	4.42
9/30/2019	14:06	4.41
11/14/2019	14:06	4.32
7/30/2019	23:30	4.31
7/30/2019	23:30	4.31
10/1/2019	2:30	4.3
10/2/2019	15:54	4.3
3/20/2019	12:24:00 PM	4.29
9/29/2019	13:18	4.29
2/19/2019	12:30:00 PM	4.28
10/30/2019	14:30	4.28
9/5/2019	5:18	4.27
9/4/2019	17:36	4.26
7/5/2019	2:18	4.23
7/5/2019	2:18	4.23
6/5/2019	1:24	4.22
11/15/2019	14:42	4.22
2/18/2019	11:24:00 AM	4.21
7/6/2019	3:24	4.21
7/6/2019	3:24	4.21
9/3/2019	16:36	4.2
7/4/2019	1:48	4.15
7/4/2019	1:48	4.15
9/3/2019	3:48	4.15
9/30/2019	1:24	4.15
10/5/2019	18:48	4.14
9/26/2019	22:54	4.13
10/13/2019	0:12	4.13
10/11/2019	23:42	4.12

\*All elevations are referenced to NAVD88

25th Avenue flooded 71 times in 2019.	Tabby Lane flooded 37 times during 2019.
Tabby Lane - Grate Frame Elevation 4.16	

10/26/2019	23:30	4.11
11/19/2019	18:00	4.1
3/19/2019	11:24:00 AM	4.09
6/4/2019	1:00	4.09
9/25/2019	21:48	4.09
10/27/2019	12:06	4.09
1/23/2019	2:36:00 PM	4.07
5/15/2019	22:24	4.06
9/28/2019	12:18	4.06
7/1/2019	23:54	4.05
7/1/2019	23:54	4.05
2/20/2019	1:06:00 AM	4.04
5/8/2019	2:54	4.04
10/10/2019	23:12	4.03
10/13/2019	12:36	4.03
12/13/2019	13:36	4.03
3/21/2019	12:36:00 AM	4.02
5/7/2019	2:06	4.02
4/20/2019	1:12:00 AM	4.01
10/26/2019	11:06	4.01
10/31/2019	15:18	4.01
2/21/2019	2:12:00 PM	4
11/13/2019	13:30	4
1/22/2019	1:42:00 PM	3.99
4/19/2019	12:18:00 AM	3.99
10/14/2019	0:42	3.96
2/23/2019	3:48:00 AM	3.95
6/3/2019	0:12	3.94
7/29/2019	22:30	3.94
7/29/2019	22:30	3.94
11/10/2019	11:18	3.94
5/16/2019	23:12	3.93
10/28/2019	12:48	3.91
10/12/2019	11:54	3.9
10/25/2019	22:36	3.9
2/17/2019	10:18:00 AM	3.88
7/7/2019	3:48	3.87
7/7/2019	3:48	3.87
4/11/2019	4:42:00 AM	3.86
12/26/2019	13:06	3.86
10/6/2019	19:30	3.84
10/14/2019	13:00	3.84
11/9/2019	10:54	3.84
11/26/2019	12:18	3.83
6/15/2019	23:48	3.82
10/2/2019	3:18	3.82
7/28/2019	21:36	3.81



25th Avenue C/L  
Elevation 3.95

Date	Time	Verified WSEL
10/18/2020	14:12	5.04
11/15/2020	12:54	4.99
9/20/2020	15:36	4.97
9/19/2020	14:36	4.93
9/15/2020	23:30	4.92
9/21/2020	16:42	4.88
12/16/2020	14:48	4.86
10/19/2020	15:00	4.8
9/17/2020	0:12	4.73
11/14/2020	12:00	4.72
10/17/2020	13:12	4.63
10/14/2020	22:48	4.59
11/13/2020	11:18	4.56
9/20/2020	2:42	4.53
9/22/2020	17:18	4.52
11/16/2020	13:54	4.5
12/15/2020	13:30	4.5
9/17/2020	12:36	4.47
9/18/2020	0:48	4.43
10/16/2020	12:12	4.42
10/15/2020	11:18	4.37
5/8/2020	1:18	4.36
10/20/2020	15:42	4.35
8/3/2020	0:24	4.3
9/19/2020	1:48	4.3
9/21/2020	3:48	4.3
5/7/2020	0:18	4.28
9/16/2020	11:48	4.28
10/15/2020	23:42	4.27
4/11/2020	3:30	4.25
10/18/2020	1:42	4.21
4/9/2020	1:30	4.2
7/3/2020	23:54	4.2
12/14/2020	12:30	4.16
7/5/2020	0:30	4.15
8/4/2020	0:24	4.14
9/14/2020	22:36	4.14
4/10/2020	2:00	4.12
8/17/2020	23:36	4.11
7/6/2020	1:42	4.1
4/6/2020	23:48	4.09
11/15/2020	0:18	4.08
7/2/2020	22:42	4.07
8/19/2020	0:12	4.07
11/1/2020	13:18	4.06

\*All elevations are referenced to NAVD88

25th Avenue flooded 61 times in 2020.	Tabby Lane flooded 33 times during 2020.
Tabby Lane - Grate Frame Elevation 4.16	

4/6/2020	11:06	4.05
9/23/2020	18:06	4.05
1/23/2020	12:12	4.04
6/6/2020	0:48	4.04
9/18/2020	13:24	4.04
10/17/2020	0:30	4.04
11/13/2020	23:24	4.04
4/5/2020	10:12	4.02
8/20/2020	1:06	4.02
10/21/2020	16:42	4.01
12/13/2020	11:30	4.01
11/18/2020	15:42	4
4/8/2020	0:36	3.98
10/4/2020	14:30	3.98
8/21/2020	2:00	3.96
11/17/2020	14:18	3.96
4/12/2020	4:06	3.95
1/22/2020	11:18	3.94
5/9/2020	2:00	3.91
5/27/2020	3:48	3.9
1/24/2020	12:48	3.86
6/9/2020	3:24	3.86
2/21/2020	11:48	3.84
5/10/2020	2:42	3.84
7/1/2020	22:00	3.84
8/22/2020	2:54	3.84
10/5/2020	15:00	3.84
10/22/2020	17:48	3.84
12/12/2020	10:30	3.84
10/19/2020	2:24	3.83
11/12/2020	10:00	3.83
4/13/2020	5:00	3.81
7/22/2020	1:30	3.8
4/5/2020	22:54	3.78
5/5/2020	23:06	3.78
5/26/2020	2:48	3.78
6/5/2020	0:06	3.77
7/23/2020	2:24	3.76
2/22/2020	12:24	3.75
10/6/2020	15:24	3.75
4/7/2020	12:12	3.74
8/1/2020	23:30	3.73
8/5/2020	1:42	3.73
9/22/2020	4:36	3.72
6/1/2020	21:18	3.7
7/21/2020	0:48	3.69
9/24/2020	19:06	3.69



25th Avenue C/L  
Elevation 3.95

Date	Time	Verified WSEL
11/7/2021	15:18	5.38
11/6/2021	14:24	5.28
11/8/2021	15:54	5.12
11/5/2021	13:12	4.85
11/4/2021	12:30	4.71
11/9/2021	16:36	4.63
9/20/2021	0:06	4.39
4/28/2021	1:12	4.38
7/24/2021	0:42	4.37
6/24/2021	0:06	4.34
10/9/2021	15:00	4.34
6/25/2021	0:48	4.31
10/7/2021	13:24	4.29
10/8/2021	14:06	4.29
12/5/2021	13:36	4.27
12/6/2021	14:18	4.27
4/29/2021	2:18	4.26
10/10/2021	16:12	4.26
4/27/2021	0:30	4.25
10/11/2021	17:06	4.24
12/4/2021	12:36	4.22
9/18/2021	23:24	4.14
7/25/2021	1:24	4.1
3/3/2021	3:54	4.09
9/20/2021	12:42	4.05
12/8/2021	16:12	4.03
9/9/2021	14:54	4.01
11/10/2021	17:36	4.01
11/6/2021	1:42	3.99
8/20/2021	23:42	3.96
8/22/2021	0:18	3.96
11/3/2021	11:30	3.93
6/26/2021	1:36	3.92
7/26/2021	2:12	3.92
1/30/2021	13:54	3.91
3/31/2021	2:30	3.91
9/21/2021	0:42	3.91
5/27/2021	1:00	3.9
1/12/2021	12:06	3.89
11/11/2021	18:42	3.89
5/29/2021	2:48	3.88
1/8/2021	8:24	3.87
1/13/2021	13:12	3.87
1/10/2021	10:18	3.86
6/27/2021	2:36	3.86

\*All elevations are referenced to NAVD88

25th Avenue flooded 31 times in 2021.	Tabby Lane flooded 21 times during 2021.
25th Avenue C/L Elevation 3.95	Tabby Lane - Grate Frame Elevation 4.16

1/11/2021	11:12	3.85
10/6/2021	12:48	3.85
1/31/2021	14:42	3.84
9/4/2021	23:00	3.84
10/12/2021	18:00	3.83
11/5/2021	0:30	3.83
7/22/2021	23:42	3.82
3/30/2021	1:30	3.81
4/30/2021	3:12	3.81
12/7/2021	15:30	3.81
12/21/2021	14:24	3.81
10/7/2021	0:48	3.8
2/12/2021	13:24	3.79
2/13/2021	14:24	3.79
5/26/2021	0:12	3.79
6/14/2021	2:48	3.79
9/16/2021	21:18	3.79
11/3/2021	23:42	3.79
5/28/2021	1:54	3.78
9/8/2021	1:12	3.77
3/4/2021	4:54	3.76
1/29/2021	13:30	3.75
6/28/2021	3:24	3.75
9/10/2021	15:12	3.74
10/13/2021	19:06	3.74
8/23/2021	0:36	3.72
9/5/2021	23:42	3.71
1/9/2021	9:24	3.7
5/2/2021	5:06	3.7
11/8/2021	3:00	3.69
9/15/2021	20:12	3.68
3/3/2021	15:54	3.67
9/17/2021	22:24	3.64
10/4/2021	23:24	3.63
10/6/2021	0:00	3.62
10/8/2021	1:36	3.62
11/7/2021	2:36	3.62
12/20/2021	13:36	3.62
10/3/2021	22:48	3.61
12/31/2021	10:30	3.61
1/15/2021	14:36	3.59
2/7/2021	9:18	3.59
11/2/2021	22:48	3.59
12/2/2021	10:54	3.59
9/10/2021	2:36	3.56
9/11/2021	16:12	3.56
5/1/2021	4:12	3.55



# Estimate

Estimate# EST-4216

Bill To  
**Thomas & Hutton Engineering - Mt. Pleasant SC**  
682 Johnnie Dodds Blvd., Suite 100  
Mt. Pleasant 29464, SC  
USA

Estimate Date : March 24, 2022

Expiry Date : June 30, 2022

Reference# : Hillary Aton

Sales person : Charlie Sullivan

Ship To  
Royall Avenue Drainage  
Improvements  
Mount Pleasant SC

Subject :  
36 and 24-inch WAPRO WaStop Budgetary Pricing for SCDOT / Isle of Palms 25th Avenue Flood Protection

Accepted By Accepted Date

#	Model	Qty	Rate	Tax %	Amount
1	WS885-S3-316 WaStop NPS 36" S Ser. Std SS316 - INCLUDES STANDARD MOUNTING BRACKETS - REFER TO ATTACHED DRAWING	2	26,410.00	9.00	52,820.00
2	WS590-S3-316 WaStop NPS 24" S Ser. Std SS316 - INCLUDES STANDARD MOUNTING BRACKETS - REFER TO ATTACHED DRAWING	1	14,780.00	9.00	14,780.00
3	Freight cost STANDARD GROUND FREIGHT	1	500.00	-	500.00

Items in Total 4	Sub Total	68,100.00
	SC STATE TAX (6%)	4,056.00
	SC COUNTY TAX (0%)	0.00
	SC CITY TAX (1%)	676.00
	SC SPECIAL TAX (1%)	676.00
	SC SPECIAL TAX (1%)	676.00
	<b>Total</b>	<b>\$74,184.00</b>



## Notes

Thanks for your enquiry. Looking forward to working with you.

Send check payment to  
Wapro Inc  
Suite 1950  
150 N. Michigan Ave.  
Chicago, IL 60601

Wire Payment Information  
JP Morgan Chase Bank  
Routing Number: 071000013  
Account Number: 974331928

## Terms & Conditions

Estimated shipping cost can be provided, actual shipping will be prepaid and added to your invoice.

Shipping from Doral, FL 33172, please allow 7 to 10 days for delivery.

Please include applicable sales tax or provide your tax exempt certificate number with your purchase order.