THOMAS & HUTTON

CONTRACT DOCUMENTS

AND

TECHNICAL SPECIFICATIONS

FOR

WATERWAY BLVD PATHWAY

PREPARED FOR:

CITY OF ISLE OF PALMS, SC

J – 27670.0010

NOVEMBER 19, 2025

thomasandhutton.com

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Attachment A – Construction Plans
Attachment B – C-SWPPPs (Include Permits)

DOCUMENT 00021

INVITATION TO BID

Legal Notice

1. Sealed proposals for **Waterway Blvd Pathway,** owned by The City of Ise of Palms (The City), will be received by The City at City Hall, 1207 Palm Boulevard, Isle of Palms, South Carolina 29451, until **Wednesday, December 31st, 2025** at **10:00 AM** at which time they will be publicly opened.

2. The project consists of the following generally described work:

   Installation of approximately 8,850 LF of a multi-use pathway and additional drainage improvements along Waterway Blvd, along with additional site improvements including but not limited to paving, grading, water/sewer utility relocations, and any incidental construction as stipulated in the plans and specifications.

3. Plans and Specifications are open to inspection at The City of Isle of Palms or may be obtained from Thomas & Hutton Engineering Co., Post Office Box 1522, Mount Pleasant, South Carolina, 29465-1522 upon payment of **$150.00** (plus shipping charges as applicable). The payment is non–refundable.

4. Bids shall be accompanied by a bid bond or certified cashier's check in an amount not less than 10% of the base bid. All bonds shall be by a surety company licensed in **South Carolina** with an "A" minimum rating of performance and a financial strength of at least five times the contract price as listed in the most current publication of "Best's Key Rating Guide Property Liability." Performance and Payment Bonds, each in an amount equal to 100% of the contract price shall be required of the successful bidder if contract is awarded. Each Bond shall be accompanied by a "Power of Attorney" authorizing the attorney–in–fact to bind the surety and certified to include the date of the bond.

5. Owner reserves the right to reject any or all Bids, including without limitation, the rights to reject any or all nonconforming, nonresponsive, unbalanced or conditional Bids and to reject the Bid of any Bidder if Owner believes it would not be in the best interest of the Project to make an award to Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by the Owner.

6. **Only pre-qualified contractors may perform work on Isle of Palms Water & Sewer Commission's (IOPWSC) water and sewer utilities.** A list of pre-qualified contractors will be made available upon request from IOPWSC.

7. Deadline for questions will be close of business on **Tuesday, December 23, 2025**. Questions shall be submitted to Richard Karkowski at karkowski.r@tandh.com.

END OF INVITATION TO BID

DOCUMENT 00110

INSTRUCTIONS TO BIDDERS

INTENTION: It is intended the Instructions to Bidders, General Conditions, Supplementary Conditions, Technical Specifications and Construction Drawings shall cover the complete work to which they relate.

ARTICLE 1 **DEFINED TERMS**: In addition to the terms defined in the General Conditions, (EJCDC C-700)(2007), additional terms used in these Instructions to Bidders have the meanings indicated below which are applicable to both the singular and plural thereof.

1.1. **Bidder** - One who submits a Bid directly to Owner as distinct from a sub-bidder, who submits a bid to a Bidder.

1.2. **Successful Bidder** - The lowest, responsible, and responsive Bidder to whom Owner (based on Owner's evaluation as hereinafter provided) makes an award.

1.3. **Bid** - A complete and properly signed offer to execute work for the prices stipulated in Bid Form and submitted in accordance with the Bidding Documents.

1.4. **Addenda** - Graphic or written documents issued by Engineer prior to the opening of Bids issued to clarify, revise, add to, or delete information in the original bidding documents or in previous addenda.

ARTICLE 2 **BID FORM**: All Bids must be made upon the Bid Forms hereto annexed, and shall state the amount bid for each item shown, and all bids must be for materials and work called for in the specifications. **Deposits for plans and specifications are not refundable.**

2.1 The Bid Form is included with the Bidding Documents; additional copies may be obtained from Engineer.

2.2 All blanks on the Bid Form must be completed by printing in black ink or by typewriter.

2.3 Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature.

2.4 All names must be typed or printed in black ink below the signature.

2.5 The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which must be filled in on the Bid Form.)

2.6 The address and telephone number for communications regarding the Bid must be shown.

ARTICLE 3 QUALIFICATIONS OF BIDDERS:

3.1 To demonstrate qualifications of the Bidder to perform the Work, each Bidder must complete the Statement of Qualifications (SOQ) section of these bid documents and submit the completed SOQ as part of the bid package to assist Owner in determining Contractor's qualifications.

Failure to submit the completed statement of qualifications could be cause for rejection of the bid.

3.2 Each Bid must contain evidence of Contractor's authority to conduct business in the state where the Work is to be performed. State Contractor license number, if applicable, must also be shown on the Bid Form.

ARTICLE 4 COPIES OF BIDDING DOCUMENTS:

4.1 Complete sets of Bidding Documents must be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

4.2 Owner and Engineer in making copies of Bidding Documents available for a non-refundable deposit do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

ARTICLE 5 EXAMINATION OF BIDDING DOCUMENTS, OTHER DATA, AND SITE:

5.1 It is the responsibility of each Bidder before submitting a bid:

5.1.1 To examine and study thoroughly the Bidding Documents and other related data identified in the Bidding Documents;

5.1.2 To visit the work site to ascertain by inspection pertinent local conditions such as location, character and accessibility of the site including existing surface and subsurface conditions in the work area; availability of facilities, location and character of existing work within or adjacent thereto, labor conditions, etc.

5.1.3 To become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, or performance of the Work;

5.1.4 To obtain and carefully study (or assume responsibility for doing so) all addition or supplementary examination investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, an Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance or the Work or which relate any aspect of the means, methods, techniques, sequences, and procedures of construction to be

employed by Bidder, including any specific means, methods, techniques, sequences, and procedures of construction expressly required of the bidding documents, and safety precautions and programs incident thereto;

5.1.5 To study and carefully correlate Bidder's knowledge and observations with the Bidding Documents and such other related data; and

5.1.6 To promptly notify Engineer of all conflicts, errors, ambiguities or discrepancies which Bidder has discovered in or between the Bidding Documents and such other related documents;

5.1.7 to agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times and in accordance with the other terms and conditions of the Bidding Documents;

5.1.8 To become aware of the general nature of the work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents;

5.1.9 To determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.

5.2 The Owner shall make available to all prospective bidders, previous to receipt of bids, information that it may have as to sub-soil conditions and surface topography at the work site. Such information shall be given as the best factual information available without being considered as a representation of the Owner.

5.3 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 5, that without exception, the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given ENGINEER written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by ENGINEER are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 6 **MANDATORY PRE-BID CONFERENCE:** No Mandatory Pre-Bid Conference will be held.

ARTICLE 7 INTERPRETATIONS AND ADDENDA:

7.1 All questions about the meaning or intent of the Bidding Documents are to be directed to Engineer. The person submitting the request shall do so in writing and be responsible for its prompt delivery. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. **Questions received less than seven days prior to the date for opening of Bids may not be answered.** Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

7.2 Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner or Engineer.

ARTICLE 8 BID SECURITY:

8.1 Each Bid must be accompanied by Bid security made payable to Owner in an amount of ten percent of Bidder's maximum Bid price and in the form of a certified or bank check or a Bid Bond (on form attached, if a form is prescribed) issued by a surety company licensed in South Carolina with an "A" minimum rating of performance and a financial strength of at least five times the contract price as listed in the most current publication of "Best's Key Rating Guide Property Liability."

8.2 The Bid security of Successful Bidder will be retained until such Bidder has executed the Agreement, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security within fifteen days after the Notice of Award, Owner may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of the seventh day after the Effective Date of the Agreement or the sixty-first day after the Bid opening, whereupon Bid security furnished by such bidders will be returned. Bid security with Bids that are not competitive will be returned within seven days after the Bid opening.

ARTICLE 9 CONTRACT COMPLETION TIME: The number of days within which, or by which the Work is to be (a) Substantially Completed and (b) also completed and ready for final payment are set forth in the Agreement. Provisions for liquidated damages, if any, are set forth in the Agreement.

ARTICLE 10 SUBSTITUTE AND "OR-EQUAL" ITEMS:

10.1 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, or those substitute or "or-equal" materials and equipment approved by ENGINEER and identified by Addendum. The materials and equipment described in the Bidding Documents establish a standard of required type, function and quality to be met by any proposed substitute or "or equal" item. No item of material or equipment will be considered by ENGINEER as a substitute or "or equal" unless written request for approval has been submitted by Bidder and has been received by ENGINEER at least 15 days prior to the date for receipt of Bids. Each such request shall conform to requirements of paragraph 6.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. ENGINEER's decision of approval or disapproval of a proposed item will be final. If ENGINEER approves any proposed item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.

ARTICLE 11 SUBCONTRACTORS, SUPPLIERS, AND OTHERS:

11.1 Each bid must be accompanied by a list of Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity. If OWNER or ENGINEER, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, OWNER or ENGINEER may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute, without an increase in the Bid.

11.2 If apparent Successful Bidder declines to make any such substitution, OWNER may award the Contact to the next lowest Bidder proposing to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which OWNER or ENGINEER makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to OWNER and ENGINEER subject to revocation of such acceptance after the Effective Date of the Agreement as provided in paragraph 6.06 of the General Conditions.

11.3 CONTRACTOR shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom CONTRACTOR has reasonable objection.

ARTICLE 12 SUBMITTAL OF BIDS: Bids shall be submitted at the time and place indicated in the Invitation to Bid and shall be enclosed in a sealed opaque envelope, marked with the project title, and name and address of Bidder, and accompanied by the Bid security and other required documents. If the Bid is sent through the mail or

other delivery system, the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it. Contractor license number(s) shall be written on the face of the bid envelope.

Each Bidder is responsible for seeing their Bid is received by the Owner not later than the advertised time set for the opening of Bids.

ARTICLE 13 MODIFICATION AND WITHDRAWAL OF BIDS:

13.1 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of bids.

13.2 If, within twenty-four hours after Bids are opened, any Bidder files a duly signed, written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner there was a material and substantial mistake in the preparation of its Bid, Bidder may withdraw its Bid and the Bid security will be returned. Thereafter, Bidder will be disqualified from further bidding on the Work to be provided.

ARTICLE 14 OPENING OF BIDS: Bids will be opened and (unless obviously non-responsive) read aloud publicly at the place where Bids are to be submitted. An abstract of the amount of the base Bids and major alternates (if any) will be made available to Bidders after the opening of Bids.

ARTICLE 15 ACCEPTANCE OF BIDS: Bids may not be withdrawn (except as noted in Paragraph 13) after the time set for the opening of Bids. Bids will remain subject to acceptance for 90 days after the day of the Bid opening, but the Owner may, in its sole discretion, release any Bid and return the Bid security prior to expiration of the acceptance period.

ARTICLE 16 AWARD OF CONTRACT:

16.1 Owner reserves the right to reject any or all Bids, including without limitation, the rights to reject any or all nonconforming, nonresponsive, unbalanced or conditional Bids and to reject the Bid of any Bidder if Owner believes it would not be in the best interest of the Project to make an award to a Bidder, whether because the Bid is not responsive, or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by the Owner.

16.2 The Owner has the authority to reject all bids, parts of all bids, or all bids for any one (1) or more supplies or contractual services included in the proposed contract. The City has the right to waive informalities or irregularities in a bid received and allow the bid to be considered.

16.3 Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and

the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

16.4 In evaluating Bids, Owner will consider the qualification of Bidders, whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

The Owner will also consider whether the Bidder involved:

a) Maintains a permanent place of business;
b) Has adequate plant and equipment to do the work properly and expeditiously;
c) Has suitable financial status to meet obligations incidental to the work;
d) Has appropriate technical experience.

16.4. Owner may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work as to which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Supplementary Conditions. Owner also may consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.

16.5. Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any bid and to establish the responsibility, qualifications and financial ability of Bidders, proposed Subcontractors, Suppliers and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

16.6. If the contract is to be awarded, it will be awarded to the Bidder whose evaluation by Owner indicates the award will be in the best interest of the Project.

16.7. If the contract is to be awarded, Owner will give Successful Bidder a Notice of Award within 90 days after the day of the Bid opening.

ARTICLE 17 **MODIFICATIONS OF QUANTITIES:** If the lowest bona fide Bid exceeds the money available for the Work, the Owner reserves the right to delete enough of the Work to bring the cost within the available funds. The Owner also reserves the right to delete whichever items or portions of items considered to be in the best interest of the Owner.

ARTICLE 18 **CONTRACT SECURITY:** The General Conditions and Supplementary Conditions set forth Owner's requirements as to performance and payment bonds. When the Successful Bidder delivers the executed Agreement to the Owner, it must be accompanied by the required performance and payment bonds.

ARTICLE 19 **SIGNING THE AGREEMENT:** When the Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within 15 days thereafter, Contractor shall sign and deliver the required counterparts of the Agreement and attached documents to Owner with the required Bonds. Within 10 days thereafter, Owner shall deliver one fully signed counterpart to Contractor.

ARTICLE 20 **LAWS AND REGULATIONS:** The Contractor shall comply with local, District, County, State, and Federal laws applicable to the work.

The Contractor shall comply with the Department of Labor Safety and Health Regulations for Construction promulgated under the Occupational Safety and Health Act of 1970 as amended through January 1, 2004 (PL 91-596) and under Section 107 of the Contract Work and Safety Standards Act (PL) 91-54). The regulations are administered by the Department of Labor and the Contractor shall allow access to the project to personnel from this Department.

ARTICLE 21 **CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE:** Contractor shall not commence work under this contract until obtaining all the insurance required by the Supplementary Conditions.

ARTICLE 22 **TERMINATION OF CONTRACT:** If the Owner is made to stop construction of the work because of an order from a Court or State Department, the contract shall be terminated. Payment will be made for work completed and a proration of the work underway, materials stored, and for the overhead and profit of the completed work and work underway. Payment will not be made for anticipated profit and overhead on work not completed or underway.

DOCUMENT 00313

BID FORM

PROJECT IDENTIFICATION: Waterway Blvd Pathway

CONTRACT IDENTIFICATION AND NUMBER:

THIS BID IS SUBMITTED TO: The City of Isle of Palms

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an agreement with OWNER in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Bid Price and within the Bid Times indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

2. BIDDER accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 90 days after the day of Bid opening, or for such longer period of time BIDDER may agree to in writing upon request of OWNER.

3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:

   a. BIDDER has examined and carefully studied the Plans and Specifications for the work and contractual documents relative thereto, and has read all Technical Provisions, Supplementary Conditions, and General Conditions, furnished prior to the opening of Bids and can fulfill the requirements of the work to be performed.

   b. BIDDER further acknowledges hereby receipt of the following Addenda:

ADDENDUM NO.	DATE

   c. BIDDER has visited the site and become familiar with and is satisfied as to the general, local and site conditions possibly affecting cost, progress, performance and furnishing of the Work;

   d. BIDDER is familiar with and is satisfied as to all federal, state, and local Laws and Regulations possibly affecting cost, progress, performance and furnishing of the Work.

   e. BIDDER has carefully studied all reports of explorations and tests of subsurface

conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structure at or contiguous to the site (except underground Facilities) have been identified in the Supplementary Conditions. BIDDER acknowledges such reports and drawings are not Contract Documents and may not be complete for BIDDER's purposes. BIDDER acknowledges OWNER and Engineer do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to Underground Facilities at or contiguous to the site. BIDDER has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost progress, performance or furnishing of the work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by BIDDER and safety precautions and programs incident thereto. BIDDER does not consider any additional examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the times, price and other terms and conditions of the Bidding Documents.

f. BIDDER is aware of the general nature of Work to be performed by Owner and others at the site relating to Work for which this Bid is submitted as indicated in the Bidding Documents.

g. BIDDER has correlated the information known to BIDDER, information and observations obtained from visits to the site, reports and drawings identified in the Bidding Documents and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.

h. BIDDER has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies BIDDER has discovered in the Bidding Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.

i. This bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

4. BIDDER will complete the Work in accordance with the Contract Documents for the following price(s):

City of Isle of Palms
Waterway Blvd Pathway
Project Bid

NOTES: THE QUANTITIES LISTED HEREIN ARE ESTIMATES ONLY AND DO NOT CONSTITUTE ANY WARRANTY OR GUARANTEE BY THE CITY, AND SHOULD NOT BE RELIED UPON BY BIDDERS. ALL QUANTITIES MAY VARY. THE TOTALS REQUIRED ON THE BID FORM HEREIN ARE FOR INFORMAL COMPARISON ONLY. PAYMENTS WILL BE BASED UPON UNIT PRICES WHERE INDICATED. CONTRACTOR MUST BID ON ALL WORK HEREIN.

ITEM	DESCRIPTION	QUANTITY		COST	
		NUMBER OF UNITS	UNIT MEASURE	UNIT PRICE	TOTAL COST
	General				
1	Mobilization	1	LS		$ -
2	Construction Staking	1	LS		$ -
3	Traffic Control	1	LS		$ -
4	As-Built Construction Plans	1	LS		$ -
	Earthwork				
5	Selected Clearing and Grubbing	2.4	AC		$ -
6	Milling Existing Asphalt Pavement	1,130	SY		$ -
7	Removal & Disposal of Existing Pavement	5,400	SY		$ -
8	Removal & Disposal of Existing Concrete	92	CY		$ -
9	Controlled Fill - Borrow Material	650	CY		$ -
10	Grading	11,300	SY		$ -
	Roadway and Pathway				
11	Graded Aggregate Base Course	8,300	SY		$ -
12	Hot Mix Asphalt Intermediate Course Type B	10	TON		$ -
13	Hot Mix Asphalt Surface Course Type B	88	TON		$ -
14	Concrete Curb and Gutter (1'-6") Vertical Face	367	LF		$ -
15	Detectable Warning Surface	385	SF		$ -
16	Concrete Driveway	550	SY		$ -
17	Brick/Paver Driveway	1,100	SF		$ -
18	Gravel Drive	75	SY		$ -
	Striping				
19	4" White Solid Lines (Pvt. Edge Lines) Thermo 90 MIL	820	LF		$ -
20	24" White Solid Lines (Stop/Diagonal Lines) Thermo 125 MIL	100	LF		$ -
21	8" White Solid Lines (Crosswalk) Epoxy Paint Slow Cure	420	LF		$ -
22	4" Yellow Solid Lines (Pvt. Edge No Passing Zone) Thermo 90 MIL	700	LF		$ -
23	Reset Sign	20	EA		$ -
	Drainage				
24	18" RC Pipe	1,726	LF		$ -
25	Junction Box	2	EA		$ -
26	Manhole	1	EA		$ -
27	Catch Basin - Type 9	4	EA		$ -
28	Drop Inlet (24" x 36")	22	EA		$ -
29	Check Valve (15" In-Line) - Installation Only	1	EA		$ -
30	Check Valve (18" In-Line) - Installation Only	4	EA		$ -
31	Check Valve (24" In-Line) - Installation Only	1	EA		$ -
	Water and Sewer Relocations				
32	12" 45 Degree Bend	11	EA		$ -
33	12" PVC Water Main	138	LF		$ -
34	8" 45 Degree Bend	2	EA		$ -
35	8" PVC Water Main	24	LF		$ -
36	12"x8" Tee	1	EA		$ -
37	8" Gate Valve	1	EA		$ -
38	Adjust Sewer Manhole Ring & Cover	16	EA		$ -
39	Steel Encasement	68	LF		$ -
	Miscellaneous				
40	Sodding	7.25	MSY		$ -
41	Timber Wall - Forest Trails Drainage	160	LF		$ -
42	CMU Wall - Firestation	138	LF		$ -

SUBTOTAL - WILD DUNES FLOOD MITIGATION **$0.00**

TOTAL BID FOR ALL ESTIMATED PRICES:_____
(Use words)

($_____)
(Figures)

Unit Prices have been computed in accordance with paragraph 11.03.C of the General Conditions.

BIDDER acknowledges estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities determined as provided, determined as provided in the Contract Documents.

5. BIDDER agrees the Work will be substantially complete within 270 calendar days after the date when the Contract Times commence to run as provided in paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with paragraph 14.07 of the General Conditions within 180 calendar days after the date when the Contract Times commence to run.

6. BIDDER accepts provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within times specified in the Agreement.

7. The following documents are attached to and made a condition of this Bid:

   a. Required Bid Security in the form of 10 percent of the Bid Total Price.

   b. A tabulation of Subcontractors, Suppliers and other persons and organizations required to be identified in this Bid.

   c. Required BIDDER's Qualification Statement with supporting data.

8. The undersigned further agrees in case of failure on his/her part to execute the said contract and the Bond within 15 consecutive calendar days after written notice being given of the award of the contract, the check or bid bond accompanying this bid, and the monies payable thereon shall be paid into the funds of the Owner as liquidated damages for such failure, otherwise, the check or bid bond accompanying this proposal shall be returned to the undersigned.

9. Communications concerning this Bid shall be addressed to:

_____
_____
_____

Attn: _____

10. Terms used in this Bid which are defined in the General Conditions or Instructions will have the meanings indicated in the General Conditions of Instructions.

SUBMITTED on _____, 20___.

_____
CONTRACTOR'S NAME

ADDRESS:

_____

_____

BY:_____

_____

State Utility Contractor License No. _____ SC

DOCUMENT 00411

BID BOND

BIDDER (Name and Address):

_____

_____

_____

SURETY (Name and Address of Principal Place of Business):

_____

_____

_____

OWNER (Name and Address):

_____

_____

_____

BID

BID DUE DATE: _____

PROJECT (*Brief Description Including Location):* Waterway Blvd Pathway, Isle of Palms, South Carolina. _____

_____

BOND

BOND NUMBER: _____ DATE: _____

(*Not later than Bid Due Date)*

PENAL SUM: _____

(10% of Bid Sum)

IN WITNESS WHEREOF, Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER	**SURETY**
_____ (Seal)	_____ (Seal)
Bidder's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	By: _____
Signature and Title	Signature and Title (Attach Power of Attorney)
Attest: _____	Attest: _____
Signature and Title	Signature and Title

Note: (1) Above addresses are to be used for giving required notice.
(2) Any singular reference to Bidder, Surety, Owner, or other party shall be considered plural where applicable.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents and Contract Documents.

3. This obligation shall be null and void if:

   3.1 Owner accepts Bidder's bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents and Contract Document, or

   3.2 All bids are rejected by Owner, or

   3.3 Owner fails to issue a notice of award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by bidder and, if applicable, consented to by Surety when required by paragraph 5 hereof.)

4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of and any and all defenses based on arising out of any time extension to issue notice of award agreed to in writing by Owner and Bidder, provided that the time for issuing notice of award including extensions shall not in the aggregate exceed 120 days from Bid Due Date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in paragraph 4 above is received by Bidder and Surety, and in no case later than one year after Bid Due Date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notice required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre–paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of the Bond conflicts with any applicable provision of any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "bid" as used herein includes a bid, offer or proposal as applicable.

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

AGREEMENT
BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

Prepared by

EJCDC®
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Issued and Published Jointly by

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National Society of Professional Engineers

1420 King Street, Alexandria, VA 22314-2794

(703) 684-2882

www.nspe.org

American Council of Engineering Companies

1015 15th Street N.W., Washington, DC 20005

(202) 347-7474

www.acec.org

American Society of Civil Engineers

1801 Alexander Bell Drive, Reston, VA 20191-4400

(800) 548-2723

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INTRODUCTION

This Agreement between Owner and Contractor for Construction Contract (Stipulated Price) ("Agreement") has been prepared for use with the Suggested Instructions to Bidders for Construction Contracts ("Instructions to Bidders") (EJCDC® C-200, 2013 Edition); the Suggested Bid Form for Construction Contracts ("Bid Form") (EJCDC® C 410, 2013 Edition); and the Standard General Conditions of the Construction Contract ("General Conditions") (EJCDC® C-700, 2013 Edition). Their provisions are interrelated, and a change in one may necessitate a change in the others. See also the Guide to the Preparation of Supplementary Conditions (EJCDC® C-800, 2013 Edition), and the Commentary on the 2013 EJCDC Construction Documents (EJCDC® C-001, 2013 Edition).

In construction contracting, as a general matter the "agreement" is the legal instrument executed (signed) by the project owner and the construction contractor, binding the parties to the terms of the contract. See CSI Project Delivery Practice Guide (2011), Section 11.1.2, p. 210, and CSI Construction Specification Practice Guide (2011), Section 5.1, p. 75. This EJCDC Agreement form serves that basic function, by identifying the parties and Contract Documents, and establishing the Contract Price and Contract Times. This Agreement form is specifically intended for stipulated price (fixed price) contracts—that is, contracts in which Owner and Contractor identify specific lump sums and unit prices as Contractor's compensation for performing the Work. For construction contracts in which the Contract Price is primarily based on costs incurred during construction, users should select EJCDC® C-525, Agreement between Owner and Contractor for Construction Contract (Cost-Plus).

This Agreement form is drafted to be flexible enough to be used on projects that are competitively bid, and for public and private contracts that are negotiated or awarded through a proposal process or otherwise. On competitively bid projects, the following documentary information would typically be made available to bidders:

- Bidding Requirements, which include the Advertisement or invitation to bid, the Instructions to Bidders, and the Bid Form that is suggested or prescribed, all of which provide information and guidance for all Bidders, and Bid Form supplements (if any) such as Bid Bond and Qualifications Statement.

- Contract Documents, which include the Agreement, performance and payment bonds, the General Conditions, the Supplementary Conditions, the Drawings, and the Specifications.

- Documents referred to in the Supplementary Conditions or elsewhere as being of interest to bidders for reference purposes, but which are not Contract Documents.

Together, the Bidding Requirements and the Contract Documents are referred to as the Bidding Documents. (The terms "Bidding Documents," "Bidding Requirements," and "Contract Documents" are defined in Article 1 of the General Conditions.) The Bidding Requirements are not Contract Documents because much of their substance pertains to the relationships prior to the award of the Contract and has little effect or impact thereafter. Many contracts are awarded without even going through a bidding process, and thus have no Bidding Requirements, illustrating that the bidding items are typically superfluous to the formation of a binding and comprehensive construction contract. In some cases, however, a bid or proposal will contain numerous line items and their prices; in such case the actual bid or proposal document may be attached as an exhibit to the Agreement to avoid extensive rekeying.

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Suggested provisions are accompanied by "Notes to User" and bracketed notes and prompts to assist in preparing the Agreement. The provisions have been coordinated with the other forms produced by EJCDC. Much of the language should be usable on most projects, but modifications and additional provisions will often be necessary. When modifying the suggested language or writing additional provisions, the user must check the other documents thoroughly for conflicts and coordination of terms, and make appropriate revisions in all affected documents.

All parties involved in construction projects benefit significantly from a standardized approach in the location of subject matter throughout the documents. Experience confirms the danger of addressing the same subject matter in more than one location; doing so frequently leads to confusion and unanticipated legal consequences. When preparing documents for a construction project, careful attention should be given to the guidance provided in EJCDC® N-122/AIA® A521, Uniform Location of Subject Matter (2012 Edition), available at no charge from the EJCDC website, www.ejcdc.org, and from the websites of EJCDC's sponsoring organizations.

CSI MasterFormat™ (50-Division format) designates Document "00 52 XX" for various forms of the owner-contractor agreement. If this format is used, the first page of the Agreement would be numbered 00 52 13-1 (or other appropriate third pair of numbers, in accordance with MasterFormat™).

Instructions and restrictions regarding the use of this document are set out in the License Agreement that accompanied the document at the time of purchase. To prepare the Agreement for inclusion in a Project Manual or for use in a specific contractual engagement, (1) remove the cover pages and this Introduction, (2) fill in Project-specific information and make revisions to the Agreement, following the guidance in the Notes to Users and bracketed notes and prompts, and the advice of legal counsel, and (3) delete the Notes to Users and bracketed notes and prompts.

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AGREEMENT
BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

THIS AGREEMENT is by and between City of Isle of Palms ("Owner") and

("Contractor").

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Choose One:

[Scope of Work #1 – Removal and Replacement of Underground Storage Tanks]

OR

[Scope of Work #2 – Removal and Replacement of Underground Storage Tanks, Piping, and Associated Fuel Systems]

ARTICLE 2 – THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: Installation of approximately 8,850 LF of a multi-use pathway and additional drainage improvements along Waterway Blvd, along with additional site improvements including but not limited to paving, grading, water/sewer utility relocations, and any incidental construction as stipulated in the plans and specifications.

ARTICLE 3 – ENGINEER

3.01 The Project has been designed by Thomas & Hutton Engineering Co.

3.02 The Owner has retained Thomas & Hutton Engineering Co., 682 Johnnie Dodds Blvd., Suite 100, Mt. Pleasant, SC 29464 ("Engineer") to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

A. TIME IS OF THE ESSENCE. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Contract Times: Days*

A. The Work will be substantially completed within 180 days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions,

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and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 240 days after the date when the Contract Times commence to run.

4.03 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. Substantial Completion: Contractor shall pay Owner $ 1,000.00 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.

2. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the time specified in paragraph 4.02.A for completion and readiness for final payment or any proper extension thereof granted by Owner, Contractor shall pay Owner $500.00 for each day expiring after the time specified in paragraph 4.02.A for completion and readiness for final payment.

ARTICLE 5 – CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:

A. For all Work, a lump sum of: $_____.

All specific cash allowances are included in the above price in accordance with Paragraph 13.02 of the General Conditions.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 25th day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

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1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract

    a. 90 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

    b. 90 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 95 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 200 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

ARTICLE 7 – INTEREST

7.01 All moneys not paid within thirty (30) days of the due date as provided in Article 15 of the General Conditions, shall bear interest at the maximum rate allowed by law in South Carolina.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

8.01 In order to induce Owner to enter into this Contract, Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.

B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Contractor will be responsible for conducting any necessary examination, investigation, exploration, test or study of the Site, in order to acquire information in reference to Site conditions.

E. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures

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of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.

F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data will be provided by Owner for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract. Contractor will be responsible for conducting any necessary examination, investigation, exploration, test or study of the Site during the Contract Times, in order to acquire information in reference to Site conditions.

G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

J. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

A. The Contract Documents consist of the following:

1. RFB Document and Addenda (if any).
2. Bid Surety Requirements/Bid Bond.
3. Payment Bond.
4. Performance Bond.
5. This Agreement.
6. General Standard Conditions.
7. Supplementary Conditions.
8. Exhibits to this Agreement (enumerated as follows):
    a. Contractor's Bid Form.
    b. Documentation of Site visits.
    c. Estimated Timeline of Work.
9. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    a. Notice of Award.
    b. Notice to Proceed.

B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).

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C. There are no Contract Documents other than those listed above in this Article 9.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 *Assignment of Contract*

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 *Successors and Assigns*

A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 *Severability*

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

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4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

10.06 *Other Provisions*

A. Owner stipulates that if the General Conditions that are made a part of this Contract are based on EJCDC® C-700, Standard General Conditions for the Construction Contract, published by the Engineers Joint Contract Documents Committee®, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

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IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

OWNER:	CONTRACTOR:
City of Isle of Palms	
By:	By:
Title:	Title:
	(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)
Attest:	Attest:
Title:	Title:
Address for giving notices:	Address for giving notices:
City of Isle of Palms	
1207 Palm Boulevard, PO Box 508	
Isle of Palms, South Carolina 29451	
	License No.: *(where applicable)*

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

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DOCUMENT 00611

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, _____
(Name & Address of Contractor)

hereinafter called "Principal" and _____
(Name & Address of Surety)

_____ of _____

State of _____, hereinafter called the "Surety" are held and

firmly bound unto The City of Isle of Palms

hereinafter called the "Owner" in the penal sum of _____

_____ Dollars ($_____)
(10% of Bid Sum)

lawful money of the United States of America, to be paid to OWNER, for the payment whereof well and truly to be made we do bind ourselves, our respective executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above bounden Principal has entered into a certain contract with the Owner dated the _____ day of _____, 2025 for the construction of:

Waterway Blvd Pathway
Isle of Palms, South Carolina
(Name of Contract/Project)

which said contract is incorporated hereby by reference and made a part hereof, and is hereinafter referred to as the Construction Contract.

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION is such, if the Principal shall promptly and faithfully perform and comply with the terms and conditions of said contract; and shall indemnify and save harmless the Owner against and from all costs, expenses, damages, injury or loss to which said Owner may be subjected by reason of any wrongdoing, including patent infringement, misconduct, want of care or skill, default, or failure of performance on the part of said Principal, its agents, subcontractors or employees, in the execution or performance of said Construction Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except to participate in conferences as provided in Subparagraph 3.1.

3. If there is no Owner Default, the Surety's obligations under this Bond shall arise after:

   3.1 The Owner has notified the Contractor and the Surety at its address described in Paragraph 10 below, the Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Construction Contract. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default; and

   3.2 The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the contract. Such Contractor Default shall not be declared earlier than twenty days after the Contractor and the Surety have received notice as provided in Subparagraph 3.1; and

   3.3 The Owner has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract or to a Contractor selected to perform the Construction Contract in accordance with the terms of the contract with the Owner.

4. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense, take one of the following actions:

   4.1 Arrange for the Contractor, with consent of the Owner, to perform and complete the Construction Contract; or

   4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent Contractors; or

   4.3 Obtain bids or negotiated proposals from qualified Contractors acceptable to the Owner in a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and the Contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default; or

   4.4 Waive its right to perform and complete, arrange for completion, or obtain a new Contractor and with reasonable promptness under the circumstances:

4.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner; or

4.4.2 Deny liability in whole or in part and notify the Owner citing reasons therefor.

5. If the Surety does not proceed as provided in paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph 4.4, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

6. After the Owner has terminated the Contractor's right to complete the Construction Contract, and if the Surety elects to act under Subparagraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:

6.1 The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract:

6.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 4; and

6.3 Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non–performance of the Contractor.

7. The Surety shall not be liable to the Owner or others for obligations of the Contractor unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, or successors.

8. The Surety hereby waives notice of any changes, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum

period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is this Bond shall be construed as a statutory bond and not as a common law bond.

12. DEFINITIONS:

12.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

12.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto;

12.3 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

12.4 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

IN WITNESS WHEREOF, this instrument is executed in six counterparts, each one of which shall be deemed an original, on this the _____ day of _____, 2025.

CONTRACTOR AS PRINCIPAL:

_____
Principal

_____
(Principal) Secretary

By:_____
(Signature & Title)

(SEAL)

_____
Address

_____

_____
Witness as to Principal

_____
Address

_____

SURETY:

_____
Surety (Company)

_____
(Surety) Secretary

By:_____
Attorney–in–Fact

(SEAL)

_____
Witness as to Surety

_____
Address

_____

Notes:

1. Date of Bond must not be prior to date of Contract. If Contractor is a Partnership, all partners should execute bond.

2. Bond must be countersigned by a South Carolina resident agent.

3. Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

DOCUMENT 00621

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, _____
(Name & Address of Contractor)

hereinafter called "Principal" and _____
(Name & Address of Surety)

_____ of _____

State of _____, hereinafter called the "Surety" are held and

firmly bound unto The City of Isle of Palms

hereinafter called the "Owner" in the penal sum of _____

_____ Dollars ($_____)
(10% of Bid Sum)

lawful money of the United States of America, to be paid to OWNER, for the payment whereof well and truly to be made we do bind ourselves, our respective executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above bounden Principal has entered into a certain contract with the Owner dated the _____ day of _____, 2025 for the construction of:

Waterway Blvd Pathway
Isle of Palms, South Carolina
(Name of Contract/Project)

which said contract is incorporated hereby by reference and made a part hereof, and is hereinafter referred to as the Construction Contract.

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION is such, if the Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and materials supplied in the prosecution of the work provided for in said Construction Contract, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. With respect to the Owner, this obligation shall be null and void if the Contractor:

   2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants; and

2.2 Defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity whose claim, demand, lien or suit is for payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 12) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.

3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.

4. The Surety shall have no obligation to Claimants under this Bond until:

4.1 Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating a claim is being made under this Bond and, with substantial accuracy, the amount of claim.

4.2 Claimants who do not have a direct contract with the Contractor:

4.2.1 Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was performed; and

4.2.2 Have either received a rejection in whole or in part from the Contractor, or not received within 30 days of furnishing the above notice, any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly; and

4.2.3 Not having been paid within 30 days, have sent a written notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.

5. Compliance shall be considered sufficient if a notice required by paragraph 4 is given by the Owner to the Contractor or to the Surety.

6. When the Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:

6.1 Send an answer to the Claimant, with a copy to the Owner, within 45 days after receipt of the claim stating the amounts undisputed and basis for challenging any amounts disputed.

6.2 Pay or arrange for payment of any undisputed amounts.

7. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

8. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any Construction Performance Bond. By the Contractor furnishing and the Owner accepting this Bond, they agree all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

9. The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor unrelated to the Construction Contract. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

11. No suit or action shall be commenced by a Claimant under this bond other than in a court of competent jurisdiction in the location in which the work or part of the work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Subparagraph 4.1 or Clause 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to Sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, Owner or Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by the Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in the Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is this Bond shall be construed as a statutory bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. DEFINITIONS:

15.1 Claimant: An individual or entity having a direct contract with the Contractor or with a Subcontractor of the Contractor to furnish labor, material, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment," that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's Subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

15.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

IN WITNESS WHEREOF, this instrument is executed in six counterparts, each one of which shall be deemed an original, on this the _____ day of _____, 2025.

CONTRACTOR AS PRINCIPAL:

_____
Principal

_____
(Principal) Secretary

By:_____
(Signature & Title)

(SEAL)

_____
Address

_____

_____
Witness as to Principal

_____
Address

_____

SURETY:

_____
Surety (Company)

_____
(Surety) Secretary

By:_____
Attorney–in–Fact

(SEAL)

_____
Witness as to Surety

_____
Address

_____

Notes:

1. Date of Bond must not be prior to date of Contract. If Contractor is a Partnership, all partners should execute bond.

2. Bond must be countersigned by a South Carolina resident agent.

3. Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

SECTION 00631

NOTICE OF AWARD

Dated _____

TO: _____
(Bidder)

ADDRESS: _____

_____

JOB NO.: 27670.0010

PROJECT: Waterway Blvd Pathway
Isle of Palms, South Carolina

CONTRACT
FOR: Installation of approximately 8,850 LF of a multi-use pathway and additional drainage improvements along Waterway Blvd, along with additional site improvements including but not limited to paving, grading, water/sewer utility relocations, and any incidental construction as stipulated in the plans and specifications.

You are notified your Bid dated _____, 2025 for the above Contract has been considered. You are the apparent successful bidder and have been awarded a contract for:

_____.
(Indicate total Work, alternates or sections of Work awarded)

The Contract Price of your contract is _____

_____ Dollars ($_____).

3 copies of each of the proposed Contract Documents (except drawings) accompany this Notice of Award.

3 sets of the Drawings will be delivered separately or otherwise made available to you

immediately.

You must comply with the following conditions precedent within 15 days of this Notice of Award, which is by _____, 2025.

1. You must deliver to the OWNER 3 fully executed counterparts of the Agreement including all the Contract Documents. Each of the Contract Documents must bear your signature on the page.

2. You must deliver with the executed Agreement the Contract Security (Bonds) as specified in the Instructions to Bidders (Article 8), General Conditions (paragraph 5.01) and Supplementary Conditions.

Failure to comply with these conditions within the time specified will entitle OWNER to consider your bid in default, to annul this Notice of Award and to declare your Bid Security forfeited.

Within ten days after you comply with the above conditions, OWNER will return to you one fully signed counterpart of the Agreement with the Contract Documents attached.

The City of Isle of Palms
OWNER

By: _____

City Administrator
(Title)

ACCEPTANCE OF AWARD

_____
(Contractor)

By: _____
(Authorized Signature)

_____
(Title)

_____
(Date)

SECTION 00641

NOTICE TO PROCEED

Dated: _____

TO: _____
(Bidder)

ADDRESS: _____

_____

JOB NO.: J–27670.0010

PROJECT: Waterway Blvd Pathway
Isle of Palms, South Carolina

CONTRACT FOR:

A. Furnishing all labor, materials, tools, equipment, and incidentals to complete the Work generally described below:

1. Installation of approximately 8,850 LF of a multi-use pathway and additional drainage improvements along Waterway Blvd, along with additional site improvements including but not limited to paving, grading, water/sewer utility relocations, and any incidental construction as stipulated in the plans and specifications.

You are notified the Contract Times under the above contract will commence to run on _____, 2025. By such date, you are to start performing your obligations under the Contract Documents. In accordance with Article 3 of the Agreement the dates of Substantial Completion and completion and readiness for final payment are _____, 2025 and _____, 2025, respectively.

Before you may start any Work at the site, paragraph 2.01 of the General Conditions provides you and OWNER must each deliver to the other (with copies to ENGINEER and other identified additional insureds) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

Before you may start any Work at the site, you must have submitted the following: Certificate of Insurance, Performance Bond, and Payment Bond.

City of Isle of Palms
OWNER

By: _____

_____
(Title)

ACCEPTANCE OF NOTICE TO PROCEED

_____
(Contractor)

By: _____
(Authorized Signature)

_____
(Title)

_____
(Date)

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

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These General Conditions have been prepared for use with the Agreement Between Owner and Contractor for Construction Contract (EJCDC® C-520, Stipulated Sum, or C-525, Cost-Plus, 2013 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other.

To prepare supplementary conditions that are coordinated with the General Conditions, use EJCDC's Guide to the Preparation of Supplementary Conditions (EJCDC® C-800, 2013 Edition). The full EJCDC Construction series of documents is discussed in the Commentary on the 2013 EJCDC Construction Documents (EJCDC® C-001, 2013 Edition).

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National Society of Professional Engineers

1420 King Street, Alexandria, VA 22314-2794

(703) 684-2882

www.nspe.org

American Council of Engineering Companies

1015 15th Street N.W., Washington, DC 20005

(202) 347-7474

www.acec.org

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1801 Alexander Bell Drive, Reston, VA 20191-4400

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b)

the Hazardous Materials Transportation Act, 49 U.S.C. §§5101 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Engineer*—The individual or entity named as such in the Agreement.

21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.

23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.

26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.

32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.

33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.

34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.

35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.

38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.

42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.

44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.

45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

46. *Unit Price Work*—Work to be paid for on the basis of unit prices.

47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives*:

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day*:

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*:

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

   a. does not conform to the Contract Documents; or

   b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

   c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).

E. *Furnish, Install, Perform, Provide*:

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words "furnish," "install," "perform," or "provide," then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Contractor's Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.

C. *Evidence of Owner's Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.

B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

A. Standards Specifications, Codes, Laws and Regulations

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*:

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements.

Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents*: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*:

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.

B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

4.03 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
2. abnormal weather conditions;
3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
4. acts of war or terrorism.

D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.

E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and

Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*:

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or

2. is of such a nature as to require a change in the Drawings or Specifications; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

    a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

    b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

    c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

    a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or

    b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or

    c. Contractor failed to give the written notice as required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

    a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

    b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;

    c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

    d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

C. *Engineer's Review*: Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

    a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;

    b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;

    c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and

    d. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

2. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental

Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.

H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment

becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.

B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.

D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.

E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.

H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.

I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.

J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

A. *Workers' Compensation*: Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.

2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).

3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).

B. *Commercial General Liability—Claims Covered*: Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:

1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.

2. claims for damages insured by reasonably available personal injury liability coverage.

3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

C. *Commercial General Liability—Form and Content*: Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage:

a. Such insurance shall be maintained for three years after final payment.

b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.

2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.

3. Broad form property damage coverage.

4. Severability of interest.

5. Underground, explosion, and collapse coverage.

6. Personal injury coverage.

7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.

8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

D. *Automobile liability*: Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.

E. *Umbrella or excess liability*: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.

F. *Contractor's pollution liability insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.

H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.

I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:

1. include at least the specific coverages provided in this Article.

2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.

3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.

4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.

5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.

J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."

2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.

3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).
5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
6. extend to cover damage or loss to insured property while in transit.
7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
8. allow for the waiver of the insurer's subrogation rights, as set forth below.
9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
10. not include a co-insurance clause.
11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
12. include performance/hot testing and start-up.
13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.

B. *Notice of Cancellation or Change*: All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.

C. *Deductibles*: The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

E. *Additional Insurance*: If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.

F. *Insurance of Other Property*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.

D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement

of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 *"Or Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;

3) it has a proven record of performance and availability of responsive service; and

4) it is not objectionable to Owner.

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.

E. *Treatment as a Substitution Request*: If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 *Substitutes*

A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is

permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
    a. shall certify that the proposed substitute item will:
        1) perform adequately the functions and achieve the results called for by the general design,
        2) be similar in substance to that specified, and
        3) be suited to the same use as that specified.
    b. will state:
        1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
        2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
        3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
    c. will identify:
        1) all variations of the proposed substitute item from that specified, and
        2) available engineering, sales, maintenance, repair, and replacement services.
    d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable

charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.

B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.

F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.

J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.

K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.

L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.

N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

7.09 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.10 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.12 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

7.14 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof.

If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements*:

1. Before submitting a Shop Drawing or Sample, Contractor shall have:

a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings*:

a. Contractor shall submit the number of copies required in the Specifications.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples*:

a. Contractor shall submit the number of Samples required in the Specifications.

b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Other Submittals*: Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review*:

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.

3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.

5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures*:

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal;

6. the issuance of a notice of acceptability by Engineer;

7. any inspection, test, or approval by others; or

8. any correction of defective Work by Owner.

D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits

payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.

B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. an itemization of the specific matters to be covered by such authority and responsibility; and

3. the extent of such authority and responsibilities.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner for whom the Owner is responsible causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's

contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.

C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or

procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.

B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.

C. Engineer's authority as to Change Orders is set forth in Article 11.

D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

1. *Change Orders*:

a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.

b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.

2. *Work Change Directives*: A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.04.C.2.a and 11.04.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under

Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.

B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures*: Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.

2. *Engineer's Action*: Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

3. *Binding Decision*: Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

B. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and

4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12 – CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor

seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*:

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

    a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

    b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

    c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

    d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

    e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*: When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances*: Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.

E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;

2. there is no corresponding adjustment with respect to any other item of Work; and

3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*:

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other

documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*:

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

   c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

   a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or

   b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

   a. to supervise, direct, or control the Work, or

   b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

   c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

a. the Work is defective, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*:

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*:

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:

a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. the Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

h. the Contract Price has been reduced by Change Orders;

i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;

j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

l. there are other items entitling Owner to a set off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the

builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.

2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other

evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents;

   b. consent of the surety, if any, to final payment;

   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

   d. a list of all disputes that Contractor believes are unsettled; and

   e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Application and Acceptance*:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

D. *Payment Becomes Due*: Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract

Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such other adjacent areas;
2. correct such defective Work;
3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly

attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this Article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and

2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this Article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

DOCUMENT 00710

SPECIAL CONDITIONS

SC–1 DESCRIPTION OF THE WORK: Installation of approximately 8,850 LF of a multi-use pathway and additional drainage improvements along Waterway Blvd, along with additional site improvements including but not limited to paving, grading, water/sewer utility relocations, and any incidental construction as stipulated in the plans and specifications.

SC–2 COMMENCEMENT AND COMPLETION OF WORK: The Contractor shall commence work within 15 days after Notice to Proceed is issued. Work shall be substantially completed within 180 calendar days.

If the Contractor fails to prosecute the work with such diligence as will insure the completion of each portion of the work within the time shown on the above schedule, plus any extensions made in accordance with Article 12 of the General Conditions; and, if the Owner does not exercise reservations as set forth in Article 13 of the General Conditions, the Contractor shall continue the work in which event liquidated damages for the delay will be impossible to determine. In lieu thereof, liquidated damages in the amount specified in the agreement.

SC–3 DRAWINGS: The work shall conform to the following drawings, all of which form a part of, and are included in, these specifications and are available in the office of Thomas & Hutton Engineering Co., 682 Johnnie Dodds Boulevard, Suite 100, Mount Pleasant, SC 29464.

Waterway Blvd Pathway	
Sheet	**Description**
C0	COVER SHEET
G0.1	GENERAL NOTES
D1.1	DEMOLITION PLAN
D1.2	DEMOLITION PLAN
D1.3	DEMOLITION PLAN
D1.4	DEMOLITION PLAN
D1.5	DEMOLITION PLAN
D1.6	DEMOLITION PLAN
D1.7	DEMOLITION PLAN
D1.8	DEMOLITION PLAN
D1.9	DEMOLITION PLAN
EC0.1	SWPPP NOTES
EC0.2	SWPPP CHARTS
EC1.1	SWPPP INITIAL
EC1.2	SWPPP INITIAL
EC1.3	SWPPP INITIAL
EC1.4	SWPPP INITIAL
EC1.5	SWPPP INITIAL
EC1.6	SWPPP INITIAL
EC1.7	SWPPP INITIAL

Waterway Blvd Pathway	
Sheet	**Description**
EC1.8	SWPPP INITIAL
EC1.9	SWPPP INITIAL
EC2.1	SWPPP STABILIZATION
EC2.2	SWPPP STABILIZATION
EC2.3	SWPPP STABILIZATION
EC2.4	SWPPP STABILIZATION
EC2.5	SWPPP STABILIZATION
EC2.6	SWPPP STABILIZATION
EC2.7	SWPPP STABILIZATION
EC2.8	SWPPP STABILIZATION
EC2.9	SWPPP STABILIZATION
EC4.1	SWPPP DETAILS
EC4.2	SWPPP DETAILS
UT1.0	UTILITY RELOCATION OVERALL
UT1.1	UTILITY RELOCATION
UT1.2	UTILITY RELOCATION
UT1.3	UTILITY RELOCATION
UT1.4	UTILITY RELOCATION
UT1.5	UTILITY RELOCATION
UT1.6	UTILITY RELOCATION
UT1.7	UTILITY RELOCATION
UT1.8	UTILITY RELOCATION
UT1.9	UTILITY RELOCATION
C1.0	PAVING, GRADING, & DRAINAGE SHEET INDEX
C1.1	PLAN & PROFILE
C1.2	PLAN & PROFILE
C1.3	PLAN & PROFILE
C1.4	PLAN & PROFILE
C1.5	PLAN & PROFILE
C1.6	PLAN & PROFILE
C1.7	PLAN & PROFILE
C1.8	PLAN & PROFILE
C1.9	PLAN & PROFILE
C1.10	PLAN & PROFILE
C1.11	PLAN & PROFILE
C1.12	PLAN & PROFILE
C1.13	PLAN & PROFILE
C1.14	PLAN & PROFILE
C1.15	PLAN & PROFILE
C1.16	PLAN & PROFILE
C1.17	PLAN & PROFILE
C1.18	PLAN & PROFILE
C1.19	PLAN & PROFILE

Waterway Blvd Pathway	
Sheet	**Description**
C1.20	PLAN & PROFILE
C1.21	PLAN & PROFILE
C1.22	PLAN & PROFILE
C1.23	PLAN & PROFILE
C1.24	PLAN & PROFILE
C1.25	PLAN & PROFILE
C1.26	PLAN & PROFILE
C1.27	PLAN & PROFILE
C1.28	PLAN & PROFILE
C1.29	PLAN & PROFILE
C1.30	PLAN & PROFILE
C1.31	PLAN & PROFILE
C1.32	PLAN & PROFILE
C1.33	PLAN & PROFILE
C1.34	PLAN & PROFILE
C1.35	PLAN & PROFILE
C1.36	PLAN & PROFILE
C1.37	DRAINAGE PROFILES
C1.38	DRAINAGE PROFILES
C1.39	DRAINAGE PROFILES
C2.1	CHECK VALVE PLAN
C2.2	CHECK VALVE PLAN
C2.3	CHECK VALVE PLAN
C3.1	SCDOT DETAILS
C3.2	WATER AND SEWER DETAILS
C3.3	PATHWAY SECTION DETAILS

SC–4 **LAYOUT OF WORK**: Control lines and master benchmarks will be furnished by the Owner. The Contractor will lay out work and will be responsible for all measurements in connection therewith.

SC–5 **OBSERVATIONS AND TESTS:** Before acceptance of the whole or any part of the work, it shall be subjected to observation and tests to determine it is in accordance with the plans and specifications. The Contractor will be required to maintain all work in a first-class condition for a 30-day operating period after the same has been completed as a whole and the Engineer has notified the Contractor in writing the work has been finished. The Contractor [Owner] shall pay for all testing and shall engage a mutually acceptable laboratory or qualified individual to conduct the tests in accordance with these specifications. No portion of the work will be accepted until tests prove it has been satisfactorily completed. The Contractor shall give the Project Engineer or Project Representative a minimum of 48 hours notice for all required observations or tests.

SC–6 **BONDS**: The Performance Bonds in the amount of 100% of the contract amount and Payment Bonds in the amount of 100% of the contract amounts shall be furnished in accordance with Article 5 of the General Conditions.

SC–7 CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE: The Contractor shall not commence work under this contract until obtaining all the insurance required under this paragraph and such insurance has been accepted by the Owner, nor shall the Contractor allow any Subcontractor to commence work on a subcontract until the insurance required of the Subcontractor has been so obtained and accepted.

a. Compensation and Employer's Liability Insurance: The Contractor shall take out and maintain during the life of the contract the statutory Worker's Compensation and Employer's Liability Insurance for all of its employees to be engaged in work on the project under the contract and, in case and such work is sublet, the Contractor should require the Subcontractor similarly to provide Worker's Compensation and Employer's Liability Insurance for all the latter's employees to be engaged in such work.

b. Bodily Injury Liability and Property Damage Liability Insurance: The Contractor shall take out and maintain during the life of the contract Bodily Injury Liability and Property Damage Liability Insurance to protect itself and any Subcontractor performing work covered by the contract from claims for damages or personal injury, including accidental death, as well as from claims for property damage, which may arise from operations under the contract, whether such operations be by the Contractor, Subcontractor, or anyone directly or indirectly employed by either of them and the amount of such insurance should be not less than:

(1) Bodily Injury Liability Insurance, in an amount not less than $1,000,000.00 for injuries, including wrongful death to any one person and subject to the same limit for each person in an amount not less than $2,000,000.00 on account of one accident. Contractual liability should be endorsed on the policy.

(2) Property Damage Insurance in an amount not less than $1,000,000.00 for damages on account of any one accident, and in an amount not less than $2,000,000.00 for damages on account of all accidents.

c. Builder's Risk Insurance (Fire and Extended Coverage): The Contractor shall have adequate fire and standard extended coverage, with a company or companies acceptable to the Owner, in force on the project.

The provisions with respect to Builder's Risk Insurance shall in no way relieve the Contractor of its obligation of completing the work covered by the Contract.

d. Proof of Carriage of Insurance: The Contractor shall furnish the Owner with certificates showing the type, amount, class of operations, effective dates, and date of expiration of policies. Such certificates shall contain substantially the following statement: "The insurance covered by this certification shall not be cancelled or materially altered, except after ten (10) days written notice has been received by the Owner."

SC–8 HOLD HARMLESS CLAUSE: The Contractor agrees to hold harmless, indemnify and defend the Owner and its agents, architects, engineers and employees from and against any and

all claims, losses, damages, demands, causes of action and any an all related costs and expenses, of every kind and character, growing out of, incidental to, or resulting directly or indirectly from the Contractor's performance of the work described herein, whether such loss, damage, injury, or liability is contributed to by the negligence of the Owner, its agents, architects, engineers, or employees, except the Contractor shall have no liability for damages or the costs incidental thereto caused by the sole negligence of the Owner, its agents, architects, engineers, or employees. The Contractor will require any and all subcontractors to conform with the provisions of this clause prior to commencing any work and agrees to ensure this clause is in conformity with the insurance provisions of the contract.

SC–9 CONTRACTOR'S STATUS: It is agreed the Contractor shall occupy the status of an Independent Contractor and the Contractor's employees are not employees of the Owner.

SC–10 CONTRACTOR'S AFFIDAVIT: Upon completion of the work and prior to final payment and settlement of all sums due hereunder, Contractor will furnish to Owner a Contractor's Affidavit in the usual form submitted by Contractor under the laws of the State of [South Carolina], [Georgia], or [North Carolina] to the effect all bills for labor, materials and services in connection with said contract have been paid in full, acknowledging receipt of the contract price and averring there are no outstanding claims under said contract which could become a lien on the real estate arising out of said contract.

SC–11 RESIDENT PROJECT ENGINEER: The Owner reserves the right to furnish a Resident Project Engineer as deemed necessary to insure the Project quality control and conformance to Plans and Specifications, who will act as the Owner's Representative on the Project and will have the authority of the Engineer as set forth in the Contract Documents.

SC–12 BARRICADES, DANGER AND WARNING SIGNS: The Contractor shall install and maintain barricades, suitable and sufficient lights, danger signals, signs, and other traffic control devices and shall take all necessary precautions for the protection of the work and safety of the public. Lanes closed to traffic shall be protected by effective barricades, lighted during hours of darkness. Suitable warning signs shall be provided to control, direct traffic, and warn pedestrians. Upon completion all barricades, signs and the like shall be removed.

SC–13 TOOLS, PLANT AND EQUIPMENT: If at any time before the commencement or during the progress of the work, tools, plant or equipment appear to the Engineer to be insufficient, inefficient or inappropriate to secure the quality of the work required or the proper rate of progress, the Engineer may order the Contractor to increase their efficiency, to improve their character, to augment their number, or to substitute new tools, plant, or equipment, as the case may be, and the Contractor must conform to such order; but a failure of the Engineer to demand such increase of efficiency, number, or improvement shall not relieve the Contractor of its obligation to secure the quality of work and the rate of progress necessary to complete the work within the time required by the contract to the satisfaction of the Owner.

SC–14 ACCIDENTS: The Contractor shall provide, at the site, such equipment and medical facilities as are necessary to supply first–aid service to anyone who may be injured in connection with the work. The Contractor must report in writing to the Engineer all accidents whatsoever arising out of, or in connection with, the performance of the work, whether on or adjacent to the site, which causes death, personal injury or property damages, giving full details and statement of witnesses. In addition, if death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the

Contractor and any subcontractor on account of any accident, the Contractor shall promptly report the facts to the Engineer, giving full details in writing of the claim. The Contractor shall advise its superintendent and foreman, who are on the site of the work, the name of the hospital and phone number and the name and phone number of the doctor to use in case of an accident.

SC–15 SANITARY PROVISIONS: The Contractor shall provide temporary sanitary facilities for the use of the workmen during the progress of the work. The sanitary facilities shall conform to the requirements of the County health Engineer. All facilities shall be removed at the completion of the contract.

SC–16 MODIFICATION OF QUANTITIES: The itemized quantities shall be considered by the Contractor as the quantities required to complete the work for the purpose of bidding. Should actual quantities required in the construction of the work be greater or less than the quantities shown on the items, an amount equal to the difference in quantities at the unit prices for the item will be added to or deducted from the contract price.

When itemized quantities are not given in the Proposal, the work shown on the plans or specified shall be considered by the Contractor to be included in the contract for the lump sum prices bid.

SC–17 RESPONSIBILITY REGARDING EXISTING UTILITIES AND STRUCTURES: The existence and location of underground utilities will be investigated and verified in the field by the Contractor before starting work. The Contractor shall call for underground utility locations. Underground utilities location service can be contacted at, 1–888–721–7877 (SC). The location of all known interferences based on the best information available has been shown on the drawings, but this information may not be complete. Excavation in the vicinity of existing structures and utilities shall be carefully done by hand. The Contractor shall be held responsible for any damage to and for maintenance and protection of existing utilities and structures. The Contractor is responsible for coordinating with the utility companies any relocation, adjustment, or replacement of utility facilities.

SC–18 INTERRUPTION OF UTILITY SERVICE: The Contractor's operations shall be conducted to interfere as little as possible with utility services. Any proposed interruption by the Contractor must be accepted in advance by the Engineer.

SC–19 OMISSION: The drawings and specifications shall both be considered as a part of the contract. Any work and material shown in the one and omitted in the other, or described in the one and not shown in the other, or which may fairly be implied by both or either, shall be furnished and performed as though shown in both, in order to give a complete and first class job.

SC–20 MEASUREMENT AND PAYMENT: Measurement and payment shall be made at the unit and lump sum contract prices shown on the Bid Schedule. Direct payment shall only be made for those items or work specifically listed in the proposal and the cost of any other work must be included in the contract price for the applicable items to which it relates.

SC–21 "OR EQUIVALENT," CLAUSE: Although the plans and specifications make reference to particular manufacturers and model numbers for various products, such reference is made only to establish function and quality of such products. If it is desired to use materials or equipment of trade names or of manufacturer's names that are different from those mentioned in the contract documents, information pertaining to such items must reach the

hands of the Engineer at least 15 days prior to the date set for the opening of bids. The burden of proving equality of a proposed substitute to an item designated by trade name or by manufacturer's name in the contract document rests on the party submitting the request for acceptance. The written application for review of a proposed substitute must be accompanied by technical data that the party requesting review desires to submit in support of its application. The Engineer will give consideration to reports from reputable independent testing laboratories, verified experience records showing the reputation of the proposed product with previous users or any other written information that is reasonable in the circumstances. The application to the Engineer for review of a proposed substitute must be accompanied by a schedule setting forth in what respects the material or equipment submitted for consideration differs from the materials or equipment designated in the contract documents. The degree of proof required for acceptance of a proposed substitute as equivalent to a named product is the amount of proof necessary to convince the Engineer beyond all doubt. To be acceptable, a proposed substitute must, in addition, meet or exceed all express requirements of the contract documents.

If submittal is accepted by the Engineer, an addendum will be issued to all prospective bidders at least five days prior to the date set for the opening of bids.

The Engineer shall be the final judge on questions of similarity and equality.

SC–22 SAFETY AND HEALTH REGULATIONS: The Contractor shall comply with the Department of Labor Safety and Health Regulations for Construction promulgated under the Occupational Safety and Health Act of 1970 as amended through January 1, 2004 (PL 91–596) and under Section 107 of the Contract Work and Safety Standards Act (PL 91–54). The regulations are administered by the Department of Labor and the Contractor shall allow access to the project to personnel from that Department.

SC–23 RECORD DATA AND DRAWINGS: The Contractor shall keep accurate, legible records of the locations, types, and sizes of sanitary lines, service laterals, manholes, cleanouts, water lines, fittings, valves, hydrants, drainage pipes, drainage structures, and other related work performed under this project. Where proposed and existing utilities cross, the Contractor shall measure and record the horizontal location and vertical separation between each crossing. Separation shall be measured between exteriors of pipes. On a set of project prints provided by the Owner, the Contractor shall prepare a set of "record" drawings from the data stated above.

The horizontal locations of all portions of items installed on this project shall be accurately tied down to features that are physical and visible, such as property corner markers and/or permanent type structures. Invert elevations of all manholes, storm sewers and structures, sanitary sewers and lift stations shall be clearly indicated. These "record" drawings shall be kept clean and dry and maintained in a current state with the progress of the work. If at any time, a copy of this plan or portion of it is requested by the Owner, such copy shall be made available within 24 hours after the request is made.

Before final acceptance of the completed installation and final payment by the Owner, the Contractor shall deliver to the Engineer, four sets of "Record" Drawings accurately depicting the horizontal and vertical as–built data described in the above paragraph. "Record" drawings for the items installed on this project shall be certified by a licensed surveyor registered in South Carolina. The size of the drawings shall be 24" x 36". The "Record" drawings shall have a coordinate system based on the South Carolina State Plane Coordinate System, North American Datum of 1983 (NAD83). Elevations shall be based on

the North American Vertical Datum of 1988 (NAVD 88). All measurements and coordinates shown shall use the U.S. Survey flood definition. Coordinates shall be shown on all drainage structures, sanitary sewer manholes, storm manholes/boxes, valve boxes/vaults, valve manholes, valves, fire hydrants, fittings, and all other related work performed under this contract. Vertical data including but not limited to, structure and manhole frame and inverts, pipe inverts, lift station frame, inverts, control levels, bottom, site grading, and as–built grading shall be shown. In addition to the "Record" drawings, Contractor shall deliver to Engineer electronic AutoCAD (v. 14 or later) files of all the data described above on a CD–ROM.

SC–24 PROPERTY CORNERS: The Contractor shall be responsible for restoring any property corners or monuments disturbed during construction. They shall be restored by a professional surveyor registered in the State of South Carolina.

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC C-700, 2013 Edition) and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

SC-1 The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract (EJCDC C-700, 2013 Edition) have the meanings assigned to them in the General Conditions.

SC-2.01.C Paragraph 2.01.C is deleted from the General Conditions in its entirety.

SC-2.02.A Paragraph 2.02.A is revised to read as follows:

"Owner shall furnish to Contractor two printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction."

SC-2.02.B Paragraph 2.02.B is revised to read as follows:

"Engineer shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professional. Engineer shall make such original printed record version of the Contract available to Contractor for review."

SC-2.03.A Paragraph 2.03.A is revised to read as follows:

"After Notice of Award is given, Contractor will submit a preliminary schedule to the Engineer, detailing the Contractor's plans for completing the project within the times identified in the Bid Form. Engineer and Owner require five business days to examine, comment on, and return the preliminary schedule to the Contractor. Any delays in the project, which are the result of delays in Contractor delivering a preliminary schedule showing completion of the work within the times prescribed, will be the sole responsibility of the Contractor and will be considered Avoidable Delays. Owner reserves the right to withhold Notice to Proceed until such schedule has been delivered and examined. It is intended that equipment and materials be so scheduled as to arrive at the job site just prior to time for installation to prevent excessive materials on hand for inventory and necessity for extensive storage facilities at the job site."

SC-2.05.A Paragraph 2.05.A is revised to read as follows:

"At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and

adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer."

SC-4.03.A The first sentence of Paragraph 4.03.A is revised as follows:

"Contractor shall be responsible for any engineering surveys which in Engineer's judgment are necessary to enable Contractor to proceed with the Work."

SC-5.01.B As Owner is a municipality and not subject to mechanic's liens, Paragraph 5.01.B is deleted from the General Conditions in its entirety.

SC-5.03 Paragraph 5.03.A is revised to read as follows:

"No reports, drawings, or technical data are known to Owner of existing surface or subsurface conditions or structures at or adjacent to the Site. Contractor shall be responsible for conducting any necessary examination, investigation, exploration, test or study of the Site and contiguous areas prior to commencement of the work."

Paragraph 5.03.B is deleted from the General Conditions in its entirety.

SC-5.04 Paragraph 5.04.A is revised to read as follows:

"Contractor's Responsibilities: The Contractor shall be fully responsible for any subsurface or physical condition that is uncovered or revealed at the Site. No Change Proposals requesting adjustment in the Contract Price or Contract Times, or both, in relation to any subsurface or physical condition that is uncovered or revealed at the Site will be accepted or granted by the Owner."

Paragraphs 5.04.B through 5.04.D are deleted from the General Conditions in their entireties.

SC-5.05 Paragraph 5.05.A is revised to read as follows:

"No information or data is known to Owner with respect to existing Underground Facilities at or adjacent to the Site. Contractor shall be responsible for conducting any necessary examination, investigation, exploration, test or study of the Site and contiguous areas prior to commencement of the work."

Paragraph 5.05.B is revised to read as follows:

"Contractor's Responsibilities: The Contractor shall be fully responsible for any Underground Facility that is uncovered or revealed at the Site. No Change Proposals requesting adjustment in the Contract Price or Contract Times, or both, in relation to any Underground Facility that is uncovered or revealed at the Site will be accepted or granted by the Owner."

Paragraphs 5.05.C through 5.05.E are deleted from the General Conditions in their entireties.

SC-5.06.A Paragraph 5.06.A is revised to read as follows:

"No reports, drawings, or technical data are known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site. Contractor shall be responsible for conducting any necessary examination, investigation, exploration, test or study of the Site and contiguous areas prior to commencement of the work."

SC-5.06.B Paragraph 5.06.B is deleted from the General Conditions in its entirety.

SC-5.06.C Paragraph 5.06.C is revised to read as follows:

"Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless the Hazardous Environmental Condition is created by Contractor or by anyone for whom Contractor is responsible."

SC-5.06.G Paragraph 5.06.G is revised to read as follows:

"Owner will not accept or grant any Change Proposals requesting adjustment in the Contract Price or Contract Times, or both, in relation to any encounter, uncover, or revelation of a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition. Contract Times may only be extended for the exact amount of time necessary in order to satisfy conditions in Paragraph 5.06.E and 5.06.F."

SC-5.06.H Paragraph 5.06.H is deleted from the General Conditions in its entirety.

SC-5.06.I Paragraph 5.06.I is deleted from the General Conditions in its entirety.

SC-6.01.C Add the following:

"Bonding surety shall be licensed in the state in which the work is being performed."

SC-6.02.D Paragraph 6.02.D is deleted from the General Conditions in its entirety.

SC-6.03.I.6 Add the following new paragraphs to the General Conditions after paragraph 6.03.I.5:

"6. The Contractor shall not commence work under this contract until it has obtained all the insurance required under this paragraph and such insurance has been accepted by the Owner, nor shall the Contractor allow any Subcontractor to commence work on its subcontract until the insurance required of the Subcontractor has been so obtained and accepted. The limits of liability for the insurance required by this paragraph shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

a. Worker's Compensation and Employer's Liability Insurance: The Contractor shall take out and maintain during the life of the contract, the statutory Worker's Compensation and Employer's Liability Insurance for all of its employees to be engaged in work on the project under the contract and, in case such work is sublet, the Contractor should require the Subcontractor similarly to provide Worker's Compensation and Employer's Liability Insurance for all the latter's

employees to be engaged in such work.

b. Contractor's General Liability Insurance shall include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody and control of Contractor. The policy shall protect Contractor and any Subcontractor performing work covered by the contract from claims for damages or personal injury, including accidental death, as well as from claims for property damage, which may arise from operations under the contract, whether such operations be by Contractor, Subcontractor, or by anyone directly or indirectly employed by either of them and the amount of such insurance should be not less than:

(1) General Aggregate	$5,000,000
(2) Products-Completed Operations Aggregate	$5,000,000
(3) Personal and Advertising Injury	$2,000,000
(4) Each Occurrence (Bodily Injury/Wrongful Death and Property Damage)	$2,000,000

(5) Property Damage liability insurance will provide Explosion, Collapse, and Underground coverages.

(6) Excess or Umbrella Liability (This coverage is not in addition to the limits in other coverages. Any combination that provides $2,000,000 coverage per individual and $5,000,000 in aggregate will fulfill this condition.)

(i)	General Aggregate	$5,000,000
(ii)	Each Occurrence	$2,000,000

c. Automobile Liability:

(1) Bodily Injury:	Each Person	$1,000,000
	Each Accident	$2,000,000
(2) Property Damage:	Each Accident	$500,000

d. Contractor's Pollution Liability Insurance:

(1) Bodily Injury:	Each Person	$1,000,000
	Each Accident	$2,000,000
(2) Property Damage:	Each Accident	$1,000,000

e. Professional Liability Insurance:

(1) General Aggregate	$1,000,000
(2) Each Occurrence	$1,000,000

f. Environmental Liability Insurance:

(1) General Aggregate	$1,000,000
(2) Each Occurrence	$1,000,000

g. Proof of Insurance: The Contractor shall furnish the Owner with certificates showing the type, amount, class of operations, effective dates, and date of expiration of policies. Such certificates shall contain substantially the following statement: "The insurance covered by this certification shall not be canceled or materially altered, except after 10 days' written notice has been received by the Owner." The certificates shall be ACORD Form 25.

h. The contractual liability coverage required by Paragraph 6.03.C.2 of the General Conditions shall provide coverage for not less than the following amounts:

Each Accident:	$2,000,000
Annual Aggregate:	$5,000,000

i. The City of Isle of Palms shall be named as an additional insured on all certificates of insurance."

SC-6.05 Paragraph 6.05 is deleted from the General Conditions in its entirety.

SC-6.06 Paragraph 6.06 is deleted from the General Conditions in its entirety.

SC-6.07 Paragraph 6.07 is deleted from the General Conditions in its entirety.

SC-7.02.B Add the following:

"Contractor shall abide by the following working hours: 7:00 am to 7:00 pm.

Owner will not be responsible for Contractor's overtime, holiday pay or weekend pay. Contractor agrees to hold Owner harmless from any and all violations of state or federal labor laws caused directly or indirectly by Contractor's actions in performance of this Contract and further agrees to indemnify Owner for any fines, penalties, fees, or other monies assessed against Owner for such violations."

SC-7.06.A Add the following to Paragraph 7.06.A:

"A list of Subcontractors shall be required to be submitted to Owner for approval with the Bid."

SC-7.07.B Paragraph 7.07.B is deleted from the General Conditions in its entirety.

SC-7.08.A Add the following:

"The Contractor is responsible for obtaining and paying for all local, state and federal permits that may be required for Contractor's performance and completion of the work under this contract. Contractor shall not proceed with the work until all required permits have been secured. Contractor shall maintain a copy of the permits on site during the work. Contractor must have a City of Isle of Palms Business License prior to commencement of the work."

SC-7.10.D-E Add new paragraphs after paragraph 7.10.C of the General Conditions that read as follows:

"D. The Contractor shall comply with the Department of Labor Safety and Health

Regulations for Construction promulgated under the Occupational Safety and Health Act of 1970 as amended through January 1, 2004 (PL 91-596) and under Section 107 of the Contract Work and Safety Standards Act (PL 91-54). The regulations are administered by the Department of Labor and the Contractor shall allow access to the project to personnel from that Department.

The Bidder's attention is directed to the fact all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout and they will be deemed to be included in the contract the same as though herein written in full.

The Contractor shall keep fully informed of all laws, ordinances and regulations of Federal, State, City and County, in any manner affecting those engaged or employed in the work, or the materials used in the work, or in any way affecting the conduct of the work, and of all orders and decrees of bodies or tribunals having any jurisdiction or authority over same. Contractor shall at all times, observe and comply with all such existing and future laws, ordinances, and regulations.

E. Owner is a municipal corporation subject to South Carolina statutory and Constitutional restraints which prevent it from expending amount in excess of that budgeted and approved by the City. No provision of this Contract shall be construed or interpreted as creating a pledge of the faith and credit of the Owner within the meaning of any constitutional debt limitation except for any funding which may have been budgeted for this contract from general obligation revenues specifically related to the Project. Beyond the amount approved by the Owner's relevant resolutions, the taxing power of the Owner is not and may not be pledged directly or indirectly or contingently to secure any monies due under this Contract. No provisions of this Contract shall be construed to pledge or create a lien on any class or source of the Owner's monies nor shall any provision of this Contract restrict the future issuance of any of the Owner's bonds or obligations payable from any class or source of the City's monies."

SC-7.11.B-C Add new paragraphs after paragraph 7.11.A of the General Conditions that read as follows:

"B. Record Data Drawings:

1. The Contractor shall keep accurate, legible records of the work performed under this project. The Contractor shall prepare a set of "record" drawings based on placement of the new UST systems and related work performed. The horizontal locations of all portions of items installed on this project shall be accurately tied down to the State Plane Coordinate System. Invert and elevations of all tanks, tank ports, piping, vents, concrete and asphalt materials shall be clearly indicated. These "record" drawings shall be kept clean and dry and maintained in a current state with the progress of the work. If at any time, a copy of this plan or portion of it is requested by the Owner, such copy shall be made available within 24 hours after the request is made.

2. Before final acceptance of the completed installation and before final payment by the Owner, the Contractor shall deliver to the Engineer a completed set of "record" drawings accurately depicting the data described above. "Record" Drawings shall

be submitted on a marked up set of project construction prints or electronically.

C. In addition, Contractor is required to keep available at the work site during all hours the Contractor is working, copies of the permits and construction placards for inspection by Owner, Engineer, and permitting agencies."

SC-7.12.A.4-5 Add the following new paragraphs to the General Conditions after Paragraph 7.12.A.3:

"4. Contractor shall safely guard the Owner's property from damages, injury, or loss in connection with this contract. Contractor shall at all times guard and protect its own work and all materials of every description both before and after being used in the work.

5. Contractor shall provide any enclosing or special protection from weather deemed necessary by Engineer without additional cost to the Owner. Partial payments under the contract will not relieve the Contractor from responsibility for protection of material, work, and property."

SC-9.09.B Add the following new paragraph to the General Conditions after paragraph 9.09.A:

"B. Personal Liability:

No officer or agent of the Owner, while acting within the scope of his/her authority, shall be subject to any personal liability or accountability by reason of his/her execution of this Contract or any other documents related to the transactions contemplated hereby. Such officers or agents shall be deemed to execute such documents in their official capacities only, and not in their individual capacities."

SC-10.01.B Add a new paragraph after paragraph 10.01.A of the General Conditions that is to read as follows:

"B. The Owner's Site Representative or his designee shall reserve the right to periodically audit the Contractor's job site(s) to ensure compliance with applicable safety regulations, rules, and standards. The Owner's Site Representative shall reserve the right to stop the work, if a hazardous situation is observed that, in the opinion of the Representative, is immediately dangerous to life or health. The job shall remain closed until such time as the unsafe condition is corrected to the satisfaction of the Representative. In all cases, the Representative shall make every effort to contact the Contractor's designated safety representative. The Representative does not have to allow a condition to persist in order to satisfy any requirement to contact the Contractor's designated safety representative. No additional compensation shall be added to the Contract Price, and the Owner shall not be liable for any expenses or damages incurred by the Contractor as a result of stopping work to correct a condition that is immediately dangerous to life or health. No additional time shall be added to the Contract Time as a result of stopping work by the Owner's Site Representative to correct a condition that is immediately dangerous to life or health."

SC-10.02.C Add a new paragraph after paragraph 10.02.B of the General Conditions that is to read as follows:

"C. If at any time before the commencement or during the progress of the work, tools, plant or equipment appear to the Engineer to be insufficient, inefficient, or inappropriate to secure the quality of the work required or the proper rate of progress, the Engineer may order the Contractor to increase their efficiency, to

improve their character, to augment their number, or to substitute new tools, plant or equipment as the case may be, and the Contractor must conform to such order; but a failure of the Engineer to demand such increase or efficiency, number, or improvements, shall not relieve the Contractor's obligation to secure the quality of work and the rate of progress necessary to complete the work within the time required by this contract to the satisfaction of the Owner."

SC-10.04 Add the following sentence at the end of paragraph 10.04 of the General Conditions:

"Owner and Engineer have the right to reject defective materials. Defective materials shall not be used in the work."

SC-11.04.B Paragraph 11.04.B of the General Conditions is revised as follows:

Delete the parenthetical clause at the end of Paragraph 11.04.B.2 in its entirety.

Delete Paragraph 11.04.B.3 in its entirety.

SC-11.04.C Paragraph 11.04.C is deleted from the General Conditions in its entirety.

SC-11.07 Paragraph 11.07 is revised as follows:

Paragraph 11.07.A.4 is revised to read as follows:

"4. Changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, Article 12, or Article 17."

Paragraph 11.07.B is revised to read as follows:

"If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed, unless either party has invoked the procedures set forth in Article 17 for the final resolution of disputes."

SC-12.01.D Paragraph 12.01.D of the General Conditions is deleted in its entirety.

SC-14.02.A Add the following sentences to paragraph 14.02.A of the General Conditions:

"The Contractor will be required to maintain all work in a condition acceptable to the Engineer for a 30-day operating period after the same has been completed as a whole, and the Engineer has notified the Contractor and Owner in writing that the work has been finished. The Contractor shall give the Project Engineer or Project Representative a minimum of 48 hours' notice for all required observations and tests."

SC-15.01.D Paragraph 15.01.D is revised to read as follows:

"1. Thirty (30) days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of paragraph 15.01.E) become due, and when due will be paid by Owner to Contractor."

SC-15.03.A Add the following sentences to paragraph 15.03.A of the General Conditions:

"In addition to the Definition for 'Substantial Completion' as stated in Section 1.01.40, 'Substantial Completion' shall also be defined as, 'All portions of newly installed systems achieve full functionality and performance to the documented satisfaction of the Owner, Engineer and state regulatory authorities'."

SC-15.03.C The third sentence of Paragraph 15.03.C is revised to read as follows:

"Owner shall have fourteen (14) days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list."

SC-15.04.A.4 Paragraph 15.04.A.4 is deleted from the General Conditions in its entirety.

SC-16.02.D Paragraph 16.02.E is revised to read as follows:

"Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure within thirty (30) days of receipt of notice."

SC-16.02.E The fourth sentence of Paragraph 16.02.E is revised to read as follows:

"Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order, subject to the provisions of Paragraph 12.01."

SC-16.03.A Paragraph 16.03.A.1 is revised to read as follows:

"1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination."

Paragraphs 16.03.A.2-3 are deleted from the General Conditions in their entirety.

SC-17.01 Paragraph 17.01 and subparagraphs A and B are deleted from the General Conditions in their entirety and replaced with the following:

"17.01 Mediation; litigation:

Either Owner or Contractor may request mediation of any Claim that has been submitted to the Claims process pursuant to Paragraph 12.01 before a decision on such Claim becomes final and binding. Mediation shall be a condition precedent to litigation. A request for mediation shall be made in writing, delivered to the other party to the Agreement, and filed with the proposed mediator within 30 days of Engineer's written action or a denial pursuant to Paragraph 12.01. Timely submission of the request shall stay the effect of Paragraph 12.01. Mediation shall be conducted in Charleston County, South Carolina. The mediator shall be a member of the South Carolina Bar and shall be selected by mutual consent and agreement of the parties. If a party fails to object to the mediator proposed by the party requesting mediation within 15 days of the initial request

for mediation, the mediator shall be deemed selected as proposed. If the parties fail to agree upon a mutually acceptable mediator within 30 days of the initial request for mediation, the mediator shall be selected from the official roster of active certified mediators in Charleston County, as provided by the South Carolina Supreme Court's Commission on Alternative Dispute Resolution and Board of Arbitrator and Mediator Certification, by choosing in alphabetical order the first available circuit court mediator from the roster.

The process shall be concluded within 60 days of filing the initial request for mediation. The date of termination of the mediation shall be determined by the mediator. The parties shall equally divide the mediator's fee and any filing fees. Agreements reached in mediation shall be enforceable as settlement agreements in any court of competent jurisdiction. Nothing contained herein shall preclude either party from seeking enforcement of the terms of mediation pursuant to this Paragraph through a court of competent jurisdiction, and the prevailing party shall also be entitled to reimbursement by the losing party for all reasonable fees and costs, including attorney's fees, incurred in the proceedings seeking enforcement.

If the Claim is not resolved by mediation, the decision resulting from the Claims process pursuant to Paragraph 12.01 shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor submits the Claim to a court of competent jurisdiction. Nothing herein shall be interpreted as waiving Owner's right to a jury trial."

SC-18.03 Paragraph 18.03 is deleted from the General Conditions in its entirety.

SPECIAL PROVISIONS

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SPECIAL SECTION 100

ISLE OF PALMS WATER AND SEWER COMMISSION (IOPWSC)

PART 1 – GENERAL

1.1 Only pre-qualified contractors may perform work on Isle of Palms Water & Sewer Commission's (IOPWSC) water and sewer utilities.

1.2 All water and sewer to be coordinated with Bill Jenkins, Special Projects Administrator, at IOPWSC. Contact information is provided below:

PO Box 528
1300 Palm Blvd.
Isle of Palms, SC 29451
843-886-6148 (Main)
843-886-5106 (Direct)
bjenkins@iopwsc.com

1.3 Contractor must provide a minimum of 72-hour notice to IOPWSC prior to need to shut down existing water and sewer utilities. A minimum 48-hour notice shall be given to affected homeowners.

1.4 No work is to be performed on IOPWSC utilities on Fridays or holidays.

1.5 Contractor to coordinate and furnish affected homeowner notifications as necessary. Notifications to be coordinated with IOPWSC and Engineer.

END OF SECTION

SPECIAL SECTION 200

PERMITS

PART 1 – GENERAL

Copies of applicable state, federal, and local permits are included in Appendix C of the C-SWPPP for each respective outfall.

Contractor shall adhere to all requirements and conditions of each permit issued.

Note that the SCDHEC OCRM Critical Area Permits require that construction shall be performed by a licensed contractor with a valid contractor's license for marine class construction.

Contractor shall maintain a copy of the permits on site during the work.

END OF SECTION

9999 SPECIAL PROVISIONS – app149780

1.) The permittee and/or contractor is to be fully aware of these provisions. Also see attached drawings, details, and location maps of proposed work to be done under this permit.

2.) Prior to the start of any work shown on this permit the permittee, the contractor, and SCDOT will meet on site to discuss proposed work, these provisions, and all required safety requirements and signage pertaining to this permit.

3.) This office is to be notified for the required preconstruction meeting and all inspection work. Contact a minimum of 48 prior to any work inside SCDOT rights-of-way being started by calling **(843) 740-1655, SCDOT Charleston County Maintenance Office Permit Manager.**

4.) Contact this office immediately if an accident should occur during this construction

5.) Permit approval is for S264 and S919 Waterway Blvd pathway Isle of Palms project install and maintain

- **All more fully shown on attached plans.**

6.) All traffic control will be the responsibility of the permittee and/or the contractor doing the work.

7.) The permittee and/or contractor will maintain positive drainage at all times during construction, until final inspection and approval is obtained.

8.) All construction signage is to be placed and maintained during the construction of this project until SCDOT final approval of work is given for all work shown on this permit. All signage is the responsibility of the permittee.

9.) Traffic control, lights, signs, and flagmen will be furnished by the permittee and/or contractor and will conform to "Manual on Uniform Traffic Control Devices", latest edition. All devices and signs will be maintained during all phases of construction. Signs not in use will be removed or coved as required.

10.) The South Carolina Department of Transportation reserves the right to impose additional conditions, provisions, and/or requirements on this permit to respond to any unforeseen, specific problems that might arise during the life of this permit, and to take any enforcement action necessary to ensure compliance with SCDOT specifications, standards, or policies.

11.) No excavated material is to be placed or let accumulate on roadway surface during the construction of this project. All material is to be removed from roadway as soon as possible.

12.) This permit has been issued with an expiration date of one year from the approval and all work shown or detailed on this permit must be completely finished and approved by that date.

INSPECTION PROVISIONS

13.) This project requires an onsite inspector certified in all required disciplines necessary to insure all construction meets SCDOT specifications and standards at all times work is be performed inside SCDOT rights-of-way. Disciplines will include but not be limited to concrete, asphalt paving, earthwork and grading, and drainage. All material sampling shall follow the SCDOT Construction Manual latest edition.

14.) This project requires a person of authority on site at all times with the ability to direct all construction operations when SCDOT representatives address any issues pertaining to requirements associated with this permit or any SCDOT specifications.

15.) The permittee is responsible to have an independent testing firm test all material used in the construction of these facilities, and all construction as per current SCDOT standards and specifications require, or as directed by the SCDOT representative on site.

16.) Information regarding inspection/inspector and testing firm shall be provided to SCDOT personnel prior to any construction beginning with SCDOT right of way.

17.) SCDOT will be notified of all times work is being performed on this installation so that if needed, an inspector will be available to be on site.

a. Prior to the start of any work inside SCDOT rights-of-way, the following items must be done:

i. All utility lines must be located and visibly marked on the ground; marking must be maintained for the duration of construction.
ii. Existing rights-of-way must be defined and marked along with any sight areas or special conditions in work zone area.
iii. All traffic control must be placed prior to the planned start of construction.
iv. All required materials, equipment, and traffic control devises will be on site and inspected prior to starting operation by SCDOT representative.

PAVEMENT PROVISIONS

18.) Any pavement to be used in the construction shown on this permit is to be placed as specified and in accordance with the South Carolina Department of Transportation standard specifications for highway construction (latest edition), whichever is greater. The pavement structure listed or shown will be used in all areas where asphalt is to be placed inside SCDOT right-of-way unless indicated differently on the permit.

19.) Any existing roadway pavement damaged or removed in connection with this work will be replaced, using the same thickness and type of material destroyed, or according to specifications called for in the South Carolina Department of Transportation construction manual (latest edition), whichever is greater.

20.) Where pavement is cut and replaced, the contractor shall cut the edges to a straight and even line before removing the pavement. No ragged edges will be allowed or accepted. All patches and repairs will have squared corners. Prior to placing new asphalt all existing edges are to be tacked as per current SCDOT specifications. In some cases an asphalt surface overlay may be required to smooth riding surface of roadway at patch, see permit for details.

21.) If the roadway pavement is cut and base material other than asphalt is replaced, the entire area is to be primed with asphalt prime coat, acceptable to the South Carolina Department of Transportation specifications, prior to the placement of asphalt surface course. All new construction having rock type base is to be primed as required.

STORM DRAIN PROVISIONS

22.) All existing storm drainage pipes disturbed during construction are to be inspected by a SCDOT representative for any signs of cracking or breakage prior to being re-laid. After the relaying of the drainage pipe it will then again be inspected for grade, alignment, and joint sealing prior to be backfilled and compaction. If a pipe is determined to have been damaged in construction to a condition where it cannot be reused, it will then be replaced with an equivalent or better grade pipe as required meeting all current SCDOT specifications. If the contractor finds an existing pipe is damaged prior to any construction in that area, he is to notify the SCDOT inspector prior to any construction.

23.) Upon placement or replacement of any storm drainage pipe or structure indicated on this permit, and prior to beginning the backfilling operation, this office is to be notified and the pipe and/or structure inspected for grade, alignment, and the sealing of all joints, or construction and placement. When approval of the pipe and/or structure is given the backfilling will be allowed. Any pipe placed and covered without being inspected may result in the pipe having to be uncovered and inspected at the cost of the permittee.

24.) Any existing storm drainage pipe removed or damaged during construction of this project will be replaced with the same size and type pipe as was present. Any change in pipe size or type will require approval from SCDOT prior to the change being made.

25.) All cross line pipes and/or sideline pipes disturbed or damaged during construction will be replaced immediately. New pipe will be placed on proper grade, sealed properly, and cleaned to provide positive drainage. Pipes are to remain uncovered until a South Carolina Department of Transportation inspector, inspect the pipe, the condition, and the placement in the trench. Then at that time the pipe is to be covered and compacted as required. Reinforced concrete

pipe used within state rights-of-way shall be stamped for conformance with South Carolina Department of Transportation specifications, and be free of any cracks, chips, or breaks.

EXCAVATION PROVISIONS

26.) Any required excavation or mucking in connection with this work, will be backfilled in six inch layers, and thoroughly compacted in a manner satisfactory to the South Carolina Department of Transportation specifications. Density tests may be required with the results to be furnished to the departments utility inspector on a weekly basis during construction, see permit for details.

27.) Compaction requirements in these provisions apply to crosscuts and longitudinal trench cuts from shoulder break to shoulder break. If compaction tests are required the maximum distance between tests shall be 500 feet. In some cases additional tests may be required, see permit for details.

28.) If unsuitable material is excavated, it will not be put back in the excavation, and will be removed from the right-of-way as soon as possible. The material will be replaced with suitable approved backfill, and be in compliance with the South Carolina Department of Transportation specifications for backfill.

29.) There shall be no excavation of soil nearer than two feet from any public utility pole or appurtenant facility without the written consent of the owner thereof. Special permission of the South Carolina Department of Transportation after an opportunity to be heard is given the owner of such pole or appurtenant facility may be given.

30.) If the side of the trench, pit, or any excavation is less than 3’-0” from the existing edge of pavement, the excavated area will be backfilled entirely with flowable fill to an elevation 6 inches from the existing ground elevation. Then brought to grade with suitable topsoil, compacted, graded, and grassed as required to eliminate any erosion.

31.) Existing ditch slopes, if excavated, shall be backfilled in six inch layers and well tamped with a mechanical tamp to 95% density (standard proctor). These lifts will be benched into the existing embankment as required. The new slopes will then be graded to match existing typical roadway cross section.

32.) No excavated material or spoil is to be placed on the pavement without the permission of the South Carolina Department of Transportation, and if permission is granted, this material must be removed daily, as soon as possible. The roadway is to be cleaned of all material in a manner as to protect the existing pavement. Any pavement destroyed, or marked by this operation will be removed and replaced as required.

33.) When shoulders and ditch slopes are reshaped and graded to a typical section, the section will match existing road section. Where the existing section is less then state standards (6’ wide

shoulder @ 12:1, front slope of ditch @ 4:1, ditch bottom as required to accommodate existing runoff, and back slope of ditch min. 3:1 or to right-of-way line) the section will be upgraded to the standard. In either case positive drainage must be established and approved by SCDOT.

34.) Contractor will maintain positive drainage at all times during construction and until final inspection and approval from South Carolina Department of Transportation is obtained.

35.) No excavation located between the edge of roadway pavement and the center of sideline ditch or 15'0" where no ditch is present is to be left open overnight. The exaction is to be either temporarily backfilled or a steel plate is to be secured of hole. In either case reflective traffic cones are to be placed around the area of the excavation until the excavation has been permanently backfilled as required and graded.

CONSTRUCTION CLEANUP PROVISIONS

36.) All areas in SCDOT right-of-way disturbed during construction are to be restored to original condition as soon as possible and maintained during entire length of project, see "SCDOT POLICY FOR SEEDING AND EROSION CONTROL MEASURES INSIDE ROADWAY RIGHTS-OF-WAY".

37.) All disturbed areas inside SCDOT rights-of-way will be seeded with a mixture of grass seed as specified in the South Carolina Department of Transportation standard specifications for highway construction, section 109b2, or latest edition. No rye grass will be allowed inside SCDOT rights-of-way. A satisfactory stand of grass will be required, prior to any acceptance or final approval is granted on this permit.

38.) All rocks, pebbles, boards, other debris along with any spoil material will be kept clear of roadway at all times as the work progresses.

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SECTION 01011

SUMMARY OF WORK

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	Not Used	

SECTION 01011

SUMMARY OF WORK

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Contract Description.

B. Work required by Contract.

C. Contract Drawings.

D. Contract Technical Specifications.

1.2 CONTRACT DESCRIPTION

A. Contract Type: Section C-520 – Agreement

1.3 WORK REQUIRED

A. Consists of Contractor furnishing all labor, materials, tools, equipment and incidentals to complete the Work generally described below:

1. Installation of approximately 8,850 LF of a multi-use pathway and additional drainage improvements along Waterway Blvd, along with additional site improvements including but not limited to paving, grading, water/sewer utility relocations, and any incidental construction as stipulated in the plans and specifications.

B. All work shall be performed as shown on the Drawings and as described in the Contract Documents and Technical Specifications.

C. All work shall comply with standards described by the Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1926, Subpart P, latest revision.

1.4 CONTRACT DRAWINGS

Waterway Blvd Pathway	
Sheet	**Description**
C0	COVER SHEET
G0.1	GENERAL NOTES
D1.1	DEMOLITION PLAN
D1.2	DEMOLITION PLAN
D1.3	DEMOLITION PLAN
D1.4	DEMOLITION PLAN
D1.5	DEMOLITION PLAN
D1.6	DEMOLITION PLAN
D1.7	DEMOLITION PLAN

Waterway Blvd Pathway	
Sheet	**Description**
D1.8	DEMOLITION PLAN
D1.9	DEMOLITION PLAN
EC0.1	SWPPP NOTES
EC0.2	SWPPP CHARTS
EC1.1	SWPPP INITIAL
EC1.2	SWPPP INITIAL
EC1.3	SWPPP INITIAL
EC1.4	SWPPP INITIAL
EC1.5	SWPPP INITIAL
EC1.6	SWPPP INITIAL
EC1.7	SWPPP INITIAL
EC1.8	SWPPP INITIAL
EC1.9	SWPPP INITIAL
EC2.1	SWPPP STABILIZATION
EC2.2	SWPPP STABILIZATION
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EC2.4	SWPPP STABILIZATION
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EC2.7	SWPPP STABILIZATION
EC2.8	SWPPP STABILIZATION
EC2.9	SWPPP STABILIZATION
EC4.1	SWPPP DETAILS
EC4.2	SWPPP DETAILS
UT1.0	UTILITY RELOCATION OVERALL
UT1.1	UTILITY RELOCATION
UT1.2	UTILITY RELOCATION
UT1.3	UTILITY RELOCATION
UT1.4	UTILITY RELOCATION
UT1.5	UTILITY RELOCATION
UT1.6	UTILITY RELOCATION
UT1.7	UTILITY RELOCATION
UT1.8	UTILITY RELOCATION
UT1.9	UTILITY RELOCATION
C1.0	PAVING, GRADING, & DRAINAGE SHEET INDEX
C1.1	PLAN & PROFILE
C1.2	PLAN & PROFILE
C1.3	PLAN & PROFILE
C1.4	PLAN & PROFILE
C1.5	PLAN & PROFILE
C1.6	PLAN & PROFILE
C1.7	PLAN & PROFILE
C1.8	PLAN & PROFILE

Waterway Blvd Pathway	
Sheet	**Description**
C1.9	PLAN & PROFILE
C1.10	PLAN & PROFILE
C1.11	PLAN & PROFILE
C1.12	PLAN & PROFILE
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C1.22	PLAN & PROFILE
C1.23	PLAN & PROFILE
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C1.25	PLAN & PROFILE
C1.26	PLAN & PROFILE
C1.27	PLAN & PROFILE
C1.28	PLAN & PROFILE
C1.29	PLAN & PROFILE
C1.30	PLAN & PROFILE
C1.31	PLAN & PROFILE
C1.32	PLAN & PROFILE
C1.33	PLAN & PROFILE
C1.34	PLAN & PROFILE
C1.35	PLAN & PROFILE
C1.36	PLAN & PROFILE
C1.37	DRAINAGE PROFILES
C1.38	DRAINAGE PROFILES
C1.39	DRAINAGE PROFILES
C2.1	CHECK VALVE PLAN
C2.2	CHECK VALVE PLAN
C2.3	CHECK VALVE PLAN
C3.1	SCDOT DETAILS
C3.2	WATER AND SEWER DETAILS
C3.3	PATHWAY SECTION DETAILS

1.5 CONTRACT TECHNICAL SPECIFICATIONS

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02070	Selective Demolition

02110	Site Clearing
02115	Specimen Tree Protection
02204	Earthwork
02210	Soil Erosion Control
02211	Erosion, Sedimentation, and Pollution Control
02231	Aggregate Base Course
02512SC	Asphaltic Concrete Binder/Surface Courses (SC)
02570	Traffic Control
02575	Surface Restoration
02667	Water Distribution
02720	Storm Drainage
02731	Wastewater Collection System
02902	Grassing

1.6 WORK SCHEDULE

A. Construct Work in stages to accommodate Owner's requirements during the construction period, coordinate construction schedule and operations with Owner.

1. Work impacting traffic patterns cannot occur during peak hours. Contractor shall coordinate and plan around these days and times.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

Not used

END OF SECTION

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SECTION 01025

MEASUREMENT AND PAYMENT

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	Not Used	

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Measurement and payment criteria applicable to the Work performed under a unit price payment method.

1.2 AUTHORITY

A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.

B. Take all measurements and compute quantities. The Engineer will verify measurements and quantities.

C. Assist by providing necessary equipment, workers, and survey personnel as required.

1.3 UNIT QUANTITIES SPECIFIED

A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements supplied or placed in the Work and verified by the Engineer determine payment.

B. If the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the unit sum/prices contracted.

1.4 MEASUREMENT OF QUANTITIES

A. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.

B. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.

C. Measurement by Area: Measured by square dimension using mean length and width or radius.

D. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.

E. Stipulated Sum/Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.

1.5 PAYMENT

A. Payment Includes: Full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work including overhead and profit.

B. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Engineer multiplied by the unit sum/price for Work which is incorporated in or made necessary by the Work.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 01135

BIDDER'S QUALIFICATIONS

Please answer all questions and have your statement notarized. If necessary, you may answer questions on separate sheets of paper and attach them to this statement. Other additional information your firm deems useful in the evaluation of your capabilities may also be included.

1. ORGANIZATION

Date of Response:_____

Legal Name of Bidder: _____

Street Address:_____

City, State, Zip Code:_____

Website:_____

Contact:_____ Phone:_____ Mobile:_____

Email Address:_____

Is the address of the business listed above a: (Please circle one listed below)

Main Office Regional Office Branch Office

When Organized:_____

When and Where Incorporated:_____

Licensed or Registered To Do Business in State of South Carolina: __Yes _____No

If No, In What (State) _____Municipality does your Company Have A Business License?_

_____

Business License Number for Said (State) _____Municipality:_____

Federal Employer I.D. Number:_____

If Partnership, list all partners and their addresses:

_____ _____
_____ _____
_____ _____
_____ _____

If there is no (State) South Carolina Partner, give name and address of agent for service of process in (State) South Carolina.

_____ _____
_____ _____
_____ _____
_____ _____

If an individual owner is not a (State) South Carolina resident, give name and address of agent for service of process in (State) South Carolina.

_____ _____
_____ _____
_____ _____
_____ _____

Is your company: (Please circle one listed below)

MBE WBE DBE MBE/WBE/DBE Certified by:_____

Has your company or any of its principals ever petitioned for bankruptcy, failed in business, defaulted or been terminated on a contract awarded to you?

_____ Yes _____ No

Has your company ever been banned or otherwise precluded from pursuing public work or have ever been found to be non–responsive by a public agency?

_____ Yes _____ No

Has your company ever had a claim made against it for improper, delayed, or non–compliant work or failure to meet warranty obligations?

_____ Yes _____ No

Is your company or any of its owners, officers, or major shareholders currently involved in any arbitration or litigation?

_____ Yes _____ No

Does your company have any outstanding judgments or claims against it?

_____ Yes _____ No

Is your company currently involved or has been involved in the last 3 years with any litigation?

_____ Yes _____ No

Has your organization ever failed to complete any work awarded to it?

_____ Yes _____ No

If yes to any of the above questions, please explain:_____

_____

_____

_____

_____

Please list any litigation brought against your company in the past five (5) years asserting that you failed to make payments to anyone.

_____

_____

_____

Has your company ever had a contract terminated for any reason?

_____ Yes _____ No

If Yes, please explain: _____

_____

_____

List the geographical areas in which you work: _____

_____

_____

List the areas of work that you normally perform with your own forces: _____

_____

_____

What percentage of the Company's work is normally subcontracted? _____%

What is the largest contract your company has completed?

Amount $_____ Year _____

Project Name / Scope / Contact Information _____

_____

_____

_____

_____

Should the work require compliance with the (State) South Carolina State Construction Licensing Board Rules and Regulations, the Contractor and any Subcontractor shall list the appropriate License number(s):

Main Contractor's License Number: _____

Subcontractor #1 License Number: _____

Subcontractor #1 Name: _____

Subcontractor #2 License Number: _____

Subcontractor #2 Name: _____

Subcontractor #3 License Number: _____

Subcontractor #3 Name: _____

(List additional if appropriate)

Year Firm Established:_____

2. EXPERIENCE

How many years have you been engaged in the contracting business under your present firm or trade name?_____

List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable.

_____

_____

_____

Current Employment (Numbers of Employees): Total: _____

Management: _____ Clerical: _____ Professional: _____

Technical: _____ Skilled Labor: _____ Common Labor: _____

Total Value of Projects Completed (last five years): $_____

A. Contracts On Hand

Project Name and Location	Owner Name Address Phone No.	Project Description	Bid $	Actual $	Anticipated Completion Date

B. Selected Similar Construction Project Examples

At Least Five (5) Projects Similar in Nature:

Project Name and Location	Owner Name Address Phone No.	Project Description	Bid $	Actual $	Completion Date

Has your company or your proposed subcontractors ever completed projects that included the following:

[List] Yes____No____

[List] Yes____No____

[List] Yes____No____

[List] Yes____No____

[List] Yes____No____

C. Safety Issues Disclosure:

Contractor's Experience Modification Rate (EMR): List Safety Issues for Last Five Years:

List Major Equipment Proposed To Be Used For This Project:

Description	Make/Model	Owned by Bidder or Sub?	Year Purchased
_____	_____	Yes ___ No ___	_____
_____	_____	Yes ___ No ___	_____
_____	_____	Yes ___ No ___	_____
_____	_____	Yes ___ No ___	_____
_____	_____	Yes ___ No ___	_____
_____	_____	Yes ___ No ___	_____
_____	_____	Yes ___ No ___	_____
_____	_____	Yes ___ No ___	_____
_____	_____	Yes ___ No ___	_____

D. Proposed Superintendent for this Project:

Name: _____

Address: _____

E. Select Project Experience of the Superintendent:

Project Name and Location	Owner Name Address Phone No.	Project Description	Bid $	Actual $	Completion Date

3. REFERENCES

Name of your Bank: _____

Address: _____

Phone: _____ Contact Person: _____

Amount of line of credit: _____ Amount Available: _____

Bonding Company: _____

Address: _____

Contact Person: _____ Phone: _____

Bonding Company's Rating: _____

Bonding Capacity: Per Job $_____ Aggregate $_____

Date of Last Bond: _____ Bond Amount $_____

Bond Rate: _____ Remaining Bonding Capacity $_____

Please list the persons or entities that provide indemnification to your Surety:_____

_____

_____

List three of your major suppliers:

A. Company:_____
Address:_____
Phone:_____ Fax:_____
Contact:_____

B. Company:_____
Address:_____
Phone:_____ Fax:_____
Contact:_____

C. Company:_____
Address:_____
Phone:_____ Fax:_____
Contact:_____

List three Contractors/Owners you do business with:

A. Company:_____
Address:_____
Phone:_____ Fax:_____
Contact:_____

B. Company:_____
Address:_____
Phone:_____ Fax:_____
Contact:_____

C. Company:_____
Address:_____
Phone:_____ Fax:_____
Contact:_____

4. SIGNATURE

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading. The undersigned also recognizes that the Owner is relying on the accuracy of the information and the responses in deciding the demonstrated competence and qualifications for the type of required work.

The foregoing statement of qualifications is submitted under oath:

Respectfully submitted:

Company Name:_____

Street Address:_____

City, State, Zip:_____

By (Signed):_____

By (Typed):_____

Title:_____

Attach satisfactory evidence of the authority of the officer, or officers, signing on behalf of a corporation.

SWORN to before me this

_____ Day of _____, 20____

_____(SEAL)

Notary Public for _____

My Commission Expires: _____

INDEX TO

DIVISION I – GENERAL REQUIREMENTS

SECTION 01300

SUBMITTALS

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DIVISION I – GENERAL REQUIREMENTS

SECTION 01300 – SUBMITTALS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Submittal procedures.

B. Construction progress schedules.

C. Product Data.

D. Shop Drawings.

E. Samples.

F. Design data.

G. Test reports.

H. Certificates.

I. Manufacturer's instructions.

J. Manufacturer's field reports.

K. Erection drawings.

1.2 RELATED SECTIONS

A. Section 01400 – Quality Control: Manufacturers' field services and reports.

B. Section 01702 – Closeout Procedures: Contract warranties, bonds, manufacturers' certificates, and closeout submittals.

1.3 SUBMITTAL PROCEDURES

A. Transmit each submittal with Engineer accepted form.

B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix. Resubmit as specified for initial submittal. Indicate on revised drawings all changes that have been made other than those requested by the Engineer.

C. Identify Project, Contractor, Subcontractor, or supplier; pertinent drawing and detail number, and specification section number, as appropriate.

D. Apply Contractor's stamp, signed or initialed verifying review, approval, products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents. Submittal without the Contractor's stamp will be returned to Contractor without Engineer's review.

E. Make all submittals far enough in advance of scheduled dates for installation to provide all required time for reviews, for securing necessary approvals, for possible revision and resubmittal, and for placing orders and securing delivery. In scheduling, allow sufficient time for the Engineer's review following the receipt of the submittal. Coordinate submission of related items. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.

F. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed Work.

G. Provide space for Contractor and Architect/Engineer review stamps.

H. When revised for resubmission, identify all changes made since previous submission.

I. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

1.4 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial schedule in duplicate within 15 days after date established in Notice to Proceed.

B. Revise and resubmit as required.

C. Submit revised schedules with each Application for Payment, identifying changes since previous version.

D. Submit a computer generated or horizontal bar chart with separate line for each section of Work, identifying first work day of each week.

E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.

F. Indicate estimated percentage of completion for each item of Work at each submission.

G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and required by allowances.

1.5 PRODUCT DATA

A. Product Data For Review:

1. Submitted to Engineer for review and conformance with information given in specifications and the design concept expressed in contract documents.

2. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article above.

B. Submit the number of copies Contractor and Owner require, plus two copies retained by Engineer.

C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. After review, distribute in accordance with the Submittal Procedures article above.

1.6 SHOP DRAWINGS

A. Contractor shall submit a minimum 6 copies of each shop drawing to the Engineer for review.

B. Submitted to Engineer for review and conformance with information given in specifications and design concept expressed in contract documents. Review of shop drawings by Engineer shall not relieve Contractor of its responsibility for accuracy of shop drawings nor for furnishing of all materials and equipment required by the contract even though such items may not be indicated on shop drawings reviewed by Engineer.

C. Shop drawings shall include applicable technical information, drawings, diagrams, performance curves, schedules, templates, calculations, instructions, measurements, and similar information as applicable to the specific item for which shop drawing is prepared.

D. Do <u>not</u> use Engineer's Drawings for shop or erection purposes.

E. Each shop drawing copy shall bear a Contractor's stamp showing they have been checked. Shop drawings submitted to the Engineer without Contractor's stamp will be returned to Contractor without review.

No review will be given to partial submittals of shop drawings for items which interconnect and/or are interdependent. It is the Contractor's responsibility to assemble shop drawings for all such interconnecting and/or interdependent items, check them and then make one submittal to Engineer.

Schedule of Submittals: Within 30 days of Contract award and prior to any shop drawing submittal, Contractor shall submit a schedule showing the estimated submittal date and desired acceptance date for each shop drawing anticipated. Time lost due to unacceptable submittals shall be the Contractor's responsibility.

1.7 SAMPLES

A. Samples For Review:

1. Submitted to Engineer for review and conformance with information given in specifications and design concept expressed in contract documents.

2. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article above.

B. Samples For Information:

1. Submitted for Engineer's knowledge as contract administrator or for the Owner.

C. Include identification on each sample, with full product information.

D. Submit the number of samples specified in individual specification sections; one of which will be retained by Engineer.

E. Reviewed samples which may be used in the Work are indicated in individual specification sections.

F. Samples will not be used for testing purposes unless specifically stated in the specification section.

1.8 DESIGN DATA

A. Submit for Engineer's knowledge as contract administrator or for the Owner.

B. Submit for information and conformance with information given in specifications and design concept expressed in contract documents.

1.9 TEST REPORTS

A. Submit for Engineer's knowledge as contract administrator or for the Owner.

B. Submit test reports for information and assessing conformance with information given in specifications and design concept expressed in contract documents.

1.10 CERTIFICATES

A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or the Contractor to Engineer, in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or product, but must be acceptable to Engineer.

1.11 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start–up, adjusting, and finishing, to Engineer for delivery to Owner in quantities specified for product Data.

B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

C. Refer to Section 01400 – Quality Control, Manufacturers' Field Services article.

1.12 MANUFACTURER'S FIELD REPORTS

A. Submit reports for Engineer's benefit as contract administrator or for the Owner.

B. Submit report in duplicate within 15 days of observation to Engineer for information.

C. Submit for information and assessing conformance with information given in specifications and design concept expressed in contract documents.

1.13 ERECTION DRAWINGS

A. Submit drawings for Engineer's benefit as contract administrator or for the Owner.

B. Submit for information and assessing conformance with information given in specifications and design concept expressed in contract documents.

C. Data indicating inappropriate or unacceptable Work may be subject to action by the Engineer or Owner.

1.14 REVIEWED SHOP DRAWINGS

A. Engineer Review.

1. Acceptable submittals will be marked “No Exceptions Taken.” A minimum of three copies will be retained by the Engineer for Engineer’s and Owner’s use and remaining copies will be returned to Contractor.

2. Submittals requiring minor corrections before the product is acceptable will be marked “Furnish as Corrected.” Contractor may order, fabricate, and ship items included in submittals, provided the indicated corrections are made.

3. Submittals marked "Revise and Resubmit" must be revised to reflect required changes and the initial review procedure repeated.

4. The "Rejected" notation is used to indicate products not acceptable. Upon return of a submittal so marked, Contractor shall repeat the initial review procedure utilizing acceptable products.

5. Only two copies of items marked "Revise and Resubmit" and "Rejected" will be reviewed and marked. One copy will be retained by Engineer and the other copy with all remaining unmarked copies will be returned to Contractor for resubmittal.

B. No Work or products shall be installed without a drawing or submittal bearing the "No Exceptions Taken" or "Furnish as Corrected" notation. Contractor shall maintain at the job site a complete set of shop drawings bearing Engineer's stamp.

C. Substitutions: In the event Contractor obtains Engineer's acceptance for use of products other than those listed first in Contract Documents, Contractor shall, at Contractor's own expense and using methods accepted by Engineer, make any changes to structures, piping and electrical work necessary to accommodate these products.

D. Use of "No Exceptions Taken" or "Furnish as Corrected" notation on shop drawings or other submittals is general and shall not relieve Contractor of the responsibility of furnishing products of proper dimension, size, quality, quantity, materials, all performance characteristics, and to efficiently perform requirements and intent of Contract Documents. Engineer's review shall not relieve Contractor of the responsibility of errors of any kind on shop drawings. Review is intended only to assure conformance with design concept of the project and compliance with information given in Contract Documents.

1.15 SUBMITTAL CHECKLIST

A. This checklist is not necessarily complete. Contractor is responsible to submit all items and materials as specified in each section.

Section	Submittal	Date Received by T & H	Accepted Submittal Returned to Owner/Contractor	Submittal Rejected & Returned	Comments
02204 – Earthwork					
	Borrow				
02210 – Soil Erosion Control					
	Silt Fence				
02231 – Aggregate Base Course					

Section	Submittal	Date Received by T & H	Accepted Submittal Returned to Owner/Contractor	Submittal Rejected & Returned	Comments
	Aggregate				
	Prime				
02231 – Aggregate Base Course					
	Aggregate				
	Prime Coat				
02512 – Asphaltic Concrete Binder/Surface Courses					
	Tack Coat				
	Asphalt Cement				
	Anti–Stripping Agent				
	Mix Designs				
02667 – Water Distribution System [02667SC – Water Distribution System] [02667BC – Water Distribution System]					
	PVC Pipe – 4"Ø and Larger				
	D.I. Pipe				
	Fittings – PVC				
	Fittings – Compact D.I.				
	Gate Valve				
	Magnetic Marking Tape				
	Valve Boxes				
	Valve Box Collar				
	Restrained Joint Fittings				
	Service Saddles				
	Tracing Wire				

Section	Submittal	Date Received by T & H	Accepted Submittal Returned to Owner/Contractor	Submittal Rejected & Returned	Comments
	Service Pipe/Tubing				
	Casing Pipe				
02720 – Storm Drainage					
	Reinforced Concrete Pipe				
	Gaskets				
	Drainage Structures				
	Frames, Covers, & Grates				
02731 – Wastewater Collection System					
	Tracing Wire				
	Magnetic Tape				
02902 – Grassing					
	Sodding				
	Seed Mix – Temporary				
	Seed Mix – Permanent				
	Fertilizer				
	Lime				

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

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SECTION 01400

QUALITY CONTROL

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Quality assurance – control of installation.

B. Tolerances

C. References and standards.

D. Testing laboratory services.

E. Manufacturer's field services.

1.2 RELATED SECTIONS

A. Section 01300 – Submittals: Submission of manufacturer's instructions and certificates.

B. Section 01410 – Testing Services.

1.3 QUALITY ASSURANCE – CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturer's instructions, including each step in sequence.

C. Should manufacturer's instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform Work by persons qualified to produce required and specified quality.

F. Verify field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.4 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturer's tolerances. Should manufacturer's tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

C. Adjust products to appropriate dimensions and position before securing in place.

D. Accessible routes shall not exceed maximum ADA allowable slopes.

1.5 REFERENCES AND STANDARDS

A. For products or workmanship specified by association, trade, or other consensus standards, complies with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current with date specified in the individual specification sections, except where a specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

D. Neither the contractual relationships, duties, nor responsibilities of the parties in Contract or those of the Architect/Engineer shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.6 TESTING SERVICES

A. Contractor will appoint and employ services of an independent firm to perform testing. Contractor shall pay for testing services required by the specifications

B. The independent firm will perform tests and other services specified in individual specification sections and as required by the Owner.

C. Testing and source quality control may occur on or off the project site. Perform off–site testing as required by the Owner.

D. Reports will be submitted by the independent firm to the Engineer and Contractor, in duplicate, indicating observations and results of tests and indicating compliance or non–compliance with Contract Documents.

E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.

1. Notify Architect/Engineer and independent firm 48 hours prior to expected time for operations requiring services.

2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

F. Testing does not relieve Contractor to perform Work to contract requirements.

G. Re–testing required because of non–conformance to specified requirements shall be performed by the same independent firm on instructions by the Engineer. Payment for re–testing will be made by the Contractor.

1.7 MANUFACTURER'S FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, and to initiate instructions when necessary.

B. Submit qualifications of observer to Architect/Engineer 15 days in advance of required observations. [Observer subject to approval of Owner.

C. Report observations and site decisions or instructions given to applicators or installers supplemental or contrary to manufacturer's written instructions.

D. Refer to Section 01300 – SUBMITTALS, MANUFACTURER'S FIELD REPORTS article.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Verify existing substrate is capable of structural support or attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Verify utility services are available, of the correct characteristics, and in the correct locations.

3.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

END OF SECTION

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SECTION 01410 – TESTING SERVICES

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	Not Used.	
PART 3 – EXECUTION		
	Not Used.	

SECTION 01410

TESTING SERVICES

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Selection and payment.

B. Contractor submittals.

C. Testing agency responsibilities.

D. Testing agency reports.

E. Limits on testing authority.

F. Contractor responsibilities.

1.2 RELATED SECTIONS

A. Testing and approvals required by public authorities.

B. Section 01300 – Submittals: Manufacturer's certificates.

C. Section 01702 – Contract Closeout: Project record documents.

1.3 REFERENCES (LATEST REVISION)

A. ASTM C 802 – Practice for Conducting an Interlaboratory Test Program to Determine the Precision of Test Methods for Construction Materials.

B. ASTM C 1077 – Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

C. ASTM C 1093 – Practice for Accreditation of Testing Agencies for Masonry.

D. ASTM D 3740 – Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

E. ASTM D 4561 – Practice for Quality Control Systems for Organizations Producing and Applying Bituminous Paving Materials.

F. ASTM E 329 – Specification for Agencies Engaged in Construction Inspection and/or Testing.

G. ASTM E 543 – Practice for Agencies Performing Nondestructive Testing.

H. ASTM E 548 – Guide for General Criteria Used for Evaluating Laboratory Competence.

I. ASTM E 699 – Practice for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating of Building Components.

1.4 SELECTION AND PAYMENT

A. Employment and payment by Contractor for services of an independent testing agency or laboratory to perform specified testing.

B. Employment of testing agency or laboratory in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

1.5 QUALITY ASSURANCE

A. Comply with requirements of practices listed in paragraph 1.3.

B. Laboratory: Authorized to operate in State in which project is located.

C. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.

D. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

1.6 CONTRACTOR SUBMITTALS

A. Prior to start of Work, submit testing laboratory name, address, and telephone number, and names of full time registered Engineer and responsible officer.

B. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

1.7 TESTING AGENCY RESPONSIBILITIES

A. Test samples of mixes submitted by Contractor.

B. Provide qualified personnel at site. Cooperate with Engineer and Contractor in performance of services.

C. Perform specified sampling and testing of products in accordance with specified standards.

D. Ascertain compliance of materials and mixes with requirements of Contract Documents.

E. Promptly notify Engineer and Contractor of observed irregularities or non–conformance of Work or products.

F. Perform additional tests required by Engineer.

G. Attend preconstruction meetings and progress meetings.

1.8 TESTING AGENCY REPORTS

A. After each test, promptly submit two copies of report to Engineer and to Contractor.

B. Include:

1. Date issued.
2. Project title and number.
3. Name of inspector.
4. Date and time of sampling or inspection.
5. Identification of product and specifications section.
6. Location in the Project.
7. Type of inspection or test.
8. Date of test.
9. Results of tests.
10. Conformance with Contract Documents.

C. When requested by Engineer, provide interpretation of test results.

1.9 LIMITS ON TESTING AUTHORITY

A. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.

B. Agency or laboratory may not approve or accept any portion of the Work.

C. Agency or laboratory may not assume any duties of Contractor.

D. Agency or laboratory has no authority to stop the Work.

1.10 CONTRACTOR RESPONSIBILITIES

A. Deliver to agency or laboratory at designated location, adequate samples of materials proposed to be used requiring testing, along with proposed mix designs.

B. Cooperate with laboratory personnel and provide access to the Work.

C. Provide incidental labor and facilities:

1. To provide access to Work to be tested.
2. To obtain and handle samples at the site or at source of products to be tested.
3. To facilitate tests.
4. To provide storage and curing of test samples.

D. Notify Engineer and laboratory 48 hours prior to expected time for operations requiring testing services.

E. Employ services of an independent qualified testing laboratory and pay for additional samples and tests required by Contractor beyond specified requirements.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

INDEX TO

SECTION 01702 – CONTRACT CLOSEOUT

Paragraph	Title	Page
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1.1	Section Includes	01702–1
1.2	Related Sections	01702–1
1.3	Closeout Procedures	01702–1
1.4	Final Cleaning	01702–1
1.5	Adjusting	01702–2
1.6	Project Record Documents	01702–2
PART 2 – PRODUCTS		
	Not Used	
PART 3 – EXECUTION		
	Not Used	

SECTION 01702

CONTRACT CLOSEOUT

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Closeout procedures.

B. Project record documents.

C. Operation and maintenance data.

D. Warranties and bonds.

E. Maintenance service.

1.2 RELATED SECTIONS

A. Section 01300 – Submittals

B. Section 01740 - Warranties.

C. Section 01741 - Bonds.

1.3 CLOSEOUT PROCEDURES

A. Submit written verification Contract Documents being reviewed, Work has been observed at appropriate times, and Work is complete in accordance with Contract Documents and ready for Engineer's review.

B. Provide submittals to Engineer required by governing or other authorities.

C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.4 FINAL CLEANING

A. Execute final cleanup prior to final project assessment.

B. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.5 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

1.6 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed Shop Drawings, Product Data, and Samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Equipment Specifications: Legibly mark and record at each product section description of actual products installed, including the following:

1. Manufacturer's name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

F. Project Record Drawings: Legibly mark each item to record actual construction including:

1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
3. Where proposed and existing utilities cross, the Contractor shall measure and record the horizontal location and vertical separation between each crossing. Separation shall be measured between exteriors and pipes.
4. Field changes of dimension and detail.
5. Details not on original Contract drawings.
6. Piling data locations, tip and cut–off elevations, and driving records.

G. Submit documents to Engineer with claim for final Application for Payment.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

INDEX TO

SECTION 01740 – WARRANTIES

Paragraph	Title	Page
PART 1 – GENERAL		
1.1	Section Includes	01740–1
1.2	Related Sections	01740–1
1.3	Form of Submittals	01740–1
1.4	Preparation of Submittals	01740–1
1.5	Time of Submittals	01740–2
PART 2 – PRODUCTS		
	Not Used	
PART 3 – EXECUTION		
	Not Used	

SECTION 01740

WARRANTIES

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Preparation and submittal of warranties.

B. Time and schedule of submittals.

1.2 RELATED SECTIONS

A. Section C 700 - General Conditions –EJCDC: Warranties and correction of work.

B. Section 01702 – Contract Closeout: Contract closeout procedures.

C. Individual Specifications Sections: Warranties required for specific Products or Work.

1.3 FORM OF SUBMITTALS

A. Bind in commercial quality 8–1/2 x 11, 2-inch, three D side ring binders with durable plastic covers.

B. Cover: Identify each binder with typed or printed title WARRANTIES with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

C. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of Product or work item.

D. Separate each warranty with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

1.4 PREPARATION OF SUBMITTALS

A. Obtain warranties executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

B. Verify documents are in proper form, contain full information, and are notarized.

C. Co–execute submittals when required.

D. Retain warranties until time specified for submittal.

1.5 TIME OF SUBMITTALS

A. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.

B. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.

C. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

INDEX TO

SECTION 01741 – BONDS

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1.3	Form of Submittals	01741-1
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1.5	Time of Submittals	01741-2
PART 2 – PRODUCTS		
	Not Used	
PART 3 – EXECUTION		
	Not Used	

SECTION 01741

BONDS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Preparation and submittal of bonds.

B. Time and schedule of submittals.

1.2 RELATED SECTIONS

A. Document 00021 - Invitation to Bid: 00110 - Instruction to Bidders: Bid bonds.

B. Section C-700 - General Conditions - EJCDC: Performance bond and labor and material payment bonds.

C. Section 01702 - Contract Closeout: Contract closeout procedures.

D. Individual Specifications Sections: Bonds required for specific Products or Work.

1.3 FORM OF SUBMITTALS

A. Bind in commercial quality 8-1/2 x 11, 2-inch, three D side ring binders with durable plastic covers.

B. Cover: Identify each binder with typed or printed title BONDS with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

C. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of Product or work item.

D. Separate each bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

1.4 PREPARATION OF SUBMITTALS

A. Obtain bonds executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of bond until the Date of Substantial completion is determined.

B. Verify documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain bonds until time specified for submittal.

1.5 TIME OF SUBMITTALS

A. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.

B. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.

C. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the bond period.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

INDEX TO

SECTION 02070 - SELECTIVE DEMOLITION

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1.2	Description of Work	02070-1
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1.4	Job Conditions	02070-1
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1.7	Explosives	02070-2
1.8	Utility Services	02070-2
1.9	Environmental Controls	02070-2
1.10	Measurement and Payment	02070-2
PART 2 – PRODUCTS		
	None this Section	
PART 3 – EXECUTION		
3.1	Preparation	02070-2
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3.3	Salvage Materials	02070-3
3.4	Disposal of Demolished Materials	02070-3
3.5	Clean-up and Repair	02070-3

SECTION 02070

SELECTIVE DEMOLITION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions apply to work of this section.

1.2 DESCRIPTION OF WORK

A. Extent of selective demolition work is indicated on drawings.

1.3 SUBMITTALS

A. Schedule: Submit schedule indicating proposed methods and sequence of operations for selective demolition work to Owner's representative for review prior to commencement of work. Include coordination for shut-off, capping, and continuation of utility services as required, together with details for dust and noise control protection. Include schedule and location for return of items identified on plans to be delivered to Owner of property.

1.4 JOB CONDITIONS

A. Condition of Structures: Owner assumes no responsibility for actual condition of items to be demolished.

B. Partial Demolition and Removal: Items indicated to be removed but of value to Contractor may be removed as work progresses. Transport salvaged items from site as they are removed.

Storage or sale of removed items on site will not be permitted.

C. Protections: Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective demolition work.

Protect from damage existing finish work to remain in place and becomes exposed during demolition operations. Remove protections at completion of work.

1.5 DAMAGES

A. Promptly repair damages caused to adjacent facilities by demolition work at no cost to Owner.

1.6 TRAFFIC

A. Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

Do not close, block or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways.

1.7 EXPLOSIVES

A. Use of explosives will not be permitted.

1.8 UTILITY SERVICES

A. Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.

Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

1.9 ENVIRONMENTAL CONTROLS

A. Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.

Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

1.10 MEASUREMENT AND PAYMENT

A. There will be no measurement for selective demolition. Payment will be made at the contract unit price per line item. Payment will include equipment, labor, materials, protection, clean-up, disposal, and all work necessary to complete the selective demolition shown on the construction drawings.

PART 2 – PRODUCTS

None in this section

PART 3 – EXECUTION

3.1 PREPARATION

A. Prior to commencement of selective demolition work, check areas in which work will be performed. Photograph or video existing conditions of surfaces, equipment, or surrounding properties that could be misconstrued as damage resulting from selective demolition work. File with Owner's representative prior to starting work.

B. Cover and protect equipment and fixtures to remain from soiling or damage when demolition work is performed in areas from which such items have not been removed.

3.2 DEMOLITION

A. Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on drawings in accordance with demolition schedule and governing regulations.

Demolish concrete in small sections. Cut concrete at junctures with construction to remain using power-driven masonry saw or hand tools. Do not use power-driven impact tools.

Completely fill below-grade areas and voids resulting from demolition work. Provide fill consisting of approved earth, gravel and sand, free of trash and debris, stones over 2" diameter, roots or other organic matter.

If unanticipated mechanical, electrical, or structural elements, which conflict with intended function or design, are encountered, investigate and measure both nature and extent of the conflict. Submit report to Owner's representative in written, accurate detail. Pending receipt of directive from Owner's representative, rearrange selective demolition schedule as necessary to continue overall job progress without delay.

3.3 SALVAGE MATERIALS

A. All equipment and materials desired by Owner shall be delivered to a designated location, not further than 2 miles from the job site. Desired equipment may include, but not be limited to, generator, transfer switch, pumps, motors, controls, valves, electrical panels, and other items.

Any articles of historic significance will remain the property of the Owner. Notify Owner's representative if such items are encountered and obtain acceptance regarding method of removal and salvage for Owner.

3.4 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove debris, rubbish and other materials resulting from demolition operations from site. Transport and legally dispose of materials off site.

If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.

Burning of removed materials is not permitted on project site.

3.5 CLEAN-UP AND REPAIR

A. Upon completion of demolition work, remove tools, equipment and demolished materials from site. Remove protections and leave site clean.

Repair demolition performed in excess of required work. Return structures and surfaces to remain to the condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

Fill in all voids created by selective demolition and grade site to drain. Grass all disturbed areas for erosion control.

END OF SECTION

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SECTION 02110 – SITE CLEARING

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2.1	Materials	02110–1
PART 3 – EXECUTION		
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3.3	Clearing	02110–3
3.4	Removal	02110–3
3.5	Disposal	02110–3
3.6	Grubbing	02110–4

SECTION 02110

SITE CLEARING

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Removal of surface debris.

B. Removal of paving, curbs, and miscellaneous items.

C. Removal of trees, shrubs, and other plant life.

D. Topsoil excavation.

1.2 RELATED SECTIONS

A. Section 02204 – Earthwork.

1.3 MEASUREMENT AND PAYMENT

A. Site Clearing: Clearing, grubbing and other items to be removed will be at the contract unit price. Includes clearing site, removing stumps, loading and removing waste materials from site.

1.4 REGULATORY REQUIREMENTS

A. Conform to applicable code for environmental requirements, disposal of debris, burning debris on site, use of herbicides, and related.

B. Coordinate clearing Work with utility companies.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Provide tree protection materials as detailed on the construction drawings.

PART 3 – EXECUTION

3.1 PREPARATION

A. Verify existing plant life designated to remain is tagged or identified.

B. Identify a waste area for placing removed materials.

3.2 PROTECTION

A. All trees on site will be saved except those marked specifically by the Owner's representative for removal during construction. No trees, including those marked for removal on site or any other tree, may be removed prior to the preconstruction conference. All trees not to be removed will be protected from injury to their roots and to their top to a distance three feet beyond the drip–line and no grading, trenching, pruning, or storage of materials may go in this area except as provided by an Owner's representative stakeout. Contractor will pay a penalty for any tree removed from the site that has not been marked specifically for removal. Contractor also will pay for any tree that dies due to damage during construction. This applies to all trees on site whether or not they are shown on the plans.

B. Contractor shall not be held accountable for damages to trees resulting from placement of fill or removal of soils where such action is required by the contract documents. Any tree, the trunk of which is within 10 feet of any footing or trench, shall be exempt from these penalties except Contractor shall exercise all reasonable precautions to preserve even these trees. Contractor agrees to pay fines as established below in the event he or any of his subcontractors causes loss or removal of trees designated to be saved under provisions of this contract.

The fines are as follows:

Caliper	Fine
1" – 2"	$ 150.00
2" – 3"	200.00
3" – 4"	250.00
4" – 5"	400.00
5" – 6"	500.00
6" – 7"	600.00
7" – 8"	750.00
8" – 11"	1,500.00
12" – 20"	2,000.00
21" & larger	$ 2,500.00

C. Trees shall be graded by Owner's representative as to variety, condition, and site importance, with above figures acting as a maximum fine. Lowest assessment amount shall be no less than one–half of the above fine figures.

D. Protect bench marks, survey control points, and existing structures from damage or displacement.

E. Protect all remaining utilities.

F. Clearing operations shall be conducted to prevent damage by falling trees to trees left standing, to existing structures and installations, and to those under construction, and to provide for the safety of employees and others.

3.3 CLEARING

A. Clear areas required for access to site and execution of work. Clearing shall consist of felling and cutting trees into sections, and satisfactory disposal of trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within area to be cleared. Trees, stumps, roots, brush, and other vegetation in areas to be cleared shall be [burned or] removed completely from the site, except such trees and vegetation as may be indicated or directed to be left standing. Trees designated to be left standing within cleared areas shall be trimmed of dead branches 1–1/2 inch or more in diameter. Limbs and branches to be trimmed shall be neatly cut close to the trunk of the tree or main branches. Cuts more than 1–1/2 inches in diameter shall be painted with an accepted treewound paint. Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations, by the erection of timber barriers or by such other means as circumstances require. Such barriers must be placed and be checked by the OWNER before construction observations can proceed (See 3.2). Clearing shall also include removal and disposal of structures obtruding, encroaching upon, or otherwise obstructing the work.

3.4 REMOVAL

A. Where indicated or directed, trees and stumps shall be removed from areas outside those areas designated for clearing and grubbing. Work shall include felling of such trees and removal of their stumps and roots. Trees shall be disposed of as hereinafter specified.

B. Remove debris, rock, and other extracted plant life from site.

C. Partially remove paving and curbs as indicated. Neatly saw cut edges at right angle to surface.

3.5 DISPOSAL

A. Disposal of trees, branches, snags, brush, stumps, etc., resulting from clearing and grubbing shall be the Contractor's responsibility and shall be disposed of by burning, removal from site, or a combination of both. All costs in connection with disposing of materials will be at the Contractor's expense. Material disposed of by burning shall be burned in a manner avoiding all hazards, such as damage to existing structures, construction in progress, trees, and vegetation. Contractor shall be responsible for compliance with all local and State laws and regulations relative to the building of fires. Disposal by burning shall be kept under constant attendance until fires have burned out or extinguished. All liability of any nature resulting from disposal of cleared and grubbed material shall become the Contractor's responsibility. Disposal of all materials cleared and grubbed will be in accordance with rules and regulations of the State of South Carolina. No material will be burned unless directed to do so by the OWNER. Contractor shall obtain a permit to burn on site from local fire department, before beginning the work.

3.6 GRUBBING

A. Grubbing shall consist of removal and disposal of stumps, roots larger than one inch in diameter, and matted roots from designated grubbing areas. This material, together with logs and other organic or metallic debris not suitable for building of pavement subgrade or building pads, shall be excavated and removed to a depth of not less than 18 inches below original surface level of the ground in embankment areas and not less than 2 feet below finished earth surface in excavated areas. Depressions made by grubbing shall be filled with suitable material and compacted to make the surface conform to original adjacent ground.

END OF SECTION

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SECTION 02115 – SPECIMEN TREE PROTECTION

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3.3	Repair of Trees Injured During Construction	02115–2
3.4	Fines	02115–2

SECTION 02115

SPECIMEN TREE PROTECTION

PART 1 – GENERAL

1.1 QUALITY ASSURANCE

A. Contractor shall provide at least one person who shall be present at all times during planting and pruning, thoroughly familiar with types of plants and trees involved and direct the digging, cutting, planting and maintenance of designated plant and tree materials.

Qualifications: Repair of tree damage shall be completed or supervised by a tree surgeon who is a member of the National Arborist Association.

Pre–Work Conference – Review on site with the Owner.

Trees to be removed will be marked with green flagging. Trees to remain will be marked with red flagging. Trees designated as "SPECIMEN" will be marked with yellow flagging.

1.2 MEASUREMENT AND PAYMENT

A. There will be no measurement for protective tree fencing. Item is included in the lump sum contract price for erosion control. Payment shall include the cost of all materials and labor necessary to complete the work as detailed on the construction drawings.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Provide tree protection materials as detailed on the construction drawings.

PART 3 – EXECUTION

3.1 PROTECTION OF SPECIMEN TREES

A. Any irreparable damage to roots, trunk or bark, or any unauthorized cutting or pruning of limbs to trees designated by the Owner as "specimen" will result in a fine. This fine shall be levied through the Application for Payment as retainage and shall be used to supplement "specimen" with tree of similar value and/or to perform extensive "state of the art" tree surgery in an attempt to save the tree.

3.2 METHODS OF PROTECTION

A. Use the following method to protect specimen trees. Actual determination of extent and combination of methods shall be determined on site.

B. Temporary Fence Enclosures: Construct protective fencing where indicated on the construction drawings. Protective fencing shall be installed a minimum of three feet beyond the dripline. No grading, trenching, pruning, or storage of materials shall be allowed inside this area.

3.3 REPAIR OF TREES INJURED DURING CONSTRUCTION

A. Repair damaged trees promptly to prevent progressive deterioration caused by damage.

Repair to trees damaged during construction according to standard arborcultural techniques recognized by International Society of Arborculture.

Remove trees damaged beyond satisfactory repair as determined by Owner. Refer to FINES AND MITIGATION in this section for loss of specimen trees.

Temporarily cover roots exposed during construction with wet burlap to prevent roots from drying out. Cover roots with earth as soon as possible.

B. Roots Cut During Construction: Coat roots 1 1/2 inches diameter or larger with antiseptic paint.

3.4 FINES

A. Fine values for designated **"SPECIMEN"** vegetation shall be determined by the following:

Caliper	Fine
1" – 2"	$ 150.00
2" – 3"	$ 200.00
3" – 4"	$ 250.00
4" – 5"	$ 400.00
5" – 6"	$ 500.00
6" – 7"	$ 600.00
7" – 8"	$ 750.00
8" – 11"	$ 1,500.00
12" – 20"	$ 2,000.00
21" & larger	$ 2,500.00

END OF SECTION

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SECTION 02204 – EARTHWORK

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3.9	Field Quality Control	02204–6
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SECTION 02204

EARTHWORK

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Grading

B. Excavation

C. Backfilling

D. Compaction

E. Remove and Replace Topsoil

F. Dressing of Shoulders and Banks

G. Stone Drainage Filter

H. Water Control

I. Testing

1.2 RELATED SECTIONS

A. Section 01400 – Quality Control

B. Section 01410 – Testing Services

C. Section 02110 – Site Clearing

1.3 MEASUREMENT AND PAYMENT

A. Grading to subgrades, construction of ditches, dressing of disturbed areas, removing and replacing topsoil, excavating, backfilling and compacting to required elevations, testing, staking, and construction supervision shall not be measured for direct payment. Payment for grading shall be included in the item to which it pertains.

B. Unsuitable Material shall not be measured for direct payment. Payment for unsuitable material shall be included in the item to which it pertains.

C. Borrow shall not be measured for direct payment. Payment for borrow shall be included in the item to which it pertains.

D. Earthwork – All earthwork associated with the installation of bulkheads, headwalls, wingwalls, weir structures, drainage filters, rip–rap, etc. shall not be measured for direct payment. Payment for the earthwork shall be included in the item to which it pertains.

E. Dewatering – No direct payment shall be made for dewatering. Dewatering shall be included in the item to which it pertains.

F. Proof Rolling – Payment will be made at the contract unit price. Payment will include furnishing a loaded truck, truck driver, fuel and rolling the designated areas.

1.4 REFERENCES (LATEST REVISION)

A. ASTM D 448 – Sizes of Aggregate for Road and Bridge Construction.

B. ASTM D 1557 – Laboratory Compaction Characteristics of Soil Using Modified Effort.

C. ASTM D 2487 – Classification of Soils for Engineering Purposes (Unified Soil Classification System).

D. ASTM D 6938 – In–Place Density and Water Content of Soil and Soil–Aggregate by Nuclear Methods (Shallow Depth).

E. ASTM D 3740 – Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

F. ASTM E 329 – Agencies Engaged in Construction Inspection and/or Testing.

1.5 SUBMITTALS

A. Section 01300 – Submittals: Procedures for submittals.

B. Materials Source: Submit gradation analysis, proctor results, and soil classification for all borrow material.

1.6 QUALITY ASSURANCE

A. Perform work in accordance with Federal, State of South Carolina, County of Charleston, Municipality of City of Isle Palms, standards.

1.7 TESTING

A. Laboratory tests for moisture density relationship for fill materials shall be in accordance with ASTM D 1557, (Modified Proctor).

B. In place density tests in accordance with ASTM D 6938.

C. Testing laboratory shall operate in accordance with ASTM D 3740 and E 329 and be acceptable to the Engineer.

D. The testing laboratory and Project Engineer/Project Representative shall be given a minimum of 48 hours notice prior to taking any of the tests.

E. Testing shall be Contractor's responsibility and performed at Contractor's expense by a commercial testing laboratory operating in accordance with subparagraph C above.

F. Test results shall be furnished to the Engineer prior to continuing with associated or subsequent work.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Borrow shall consist of sand or sand–clay soils capable of being readily shaped and compacted to the required densities, and shall be reasonably free of roots, trash, rock larger than 2 inches, and other deleterious material.

B. All soils used for structural fills shall have a PI (plastic index) of less than 10, and a LL (liquid limit) of less than 30. Fill soils shall be dried or wetted to appropriate moisture contents prior to compaction. Additionally, fill soils used for the top 2 feet of fill beneath roads and parking lots shall have no more than 15% passing the # 200 sieve. Fill soils used for house lots shall have no more than 25% passing the # 200 sieve.

C. Contractor shall furnish all borrow material.

D. Contractor shall be responsible for and bear all expenses in developing borrow sources including securing necessary permits, drying the material, haul roads, clearing, grubbing, excavating the pits, placing, compaction and restoration of pits and haul roads to a condition satisfactory to property owners and in compliance with applicable federal, state, and local laws and regulations.

2.2 SOURCE QUALITY CONTROL

A. If tests indicate materials do not meet specified requirements, change material and retest.

B. Provide materials of each type from same source throughout the Work.

PART 3 – EXECUTION

3.1 TOPSOIL

A. Contractor shall strip topsoil and stockpile on site at a location determined by the Owner at the Contractor's expense.

B. Topsoil shall be placed to a depth of 4 inches over all disturbed or proposed landscaped areas.

C. Topsoil shall be provided at Contractor’s expense if it is not available from site.

D. Any remaining topsoil will be hauled off site at the Contractors expense.

E. Do not excavate wet topsoil.

3.2 EXCAVATION

A. Suitable excavation material shall be transported to and placed in fill areas within limits of the work.

B. Unsuitable material encountered in areas to be paved and under building pads, shall be excavated 2 feet below final grade and replaced with suitable material from site or borrow excavations. Contractor shall notify Engineer if more than 2 feet of excavation is needed to replace unsuitable material.

C. Unsuitable and surplus excavation material not required for fill shall be disposed of off site.

D. Proper drainage, including sediment and erosion control, shall be maintained at all times. Methods shall be in accordance with the National Pollutant Discharge Elimination System standards and other local, state, and federal regulations.

E. Unsuitable materials as stated herein are defined as highly plastic clay soils, of the CH and MH designation, border line soils of the SC–CH description, and organic soils of the OL and OH description based on the Unified Soils Classification System. Further, any soils for the top two feet of pavement subbase shall have no more than 15% passing the # 200 sieve.

3.3 GROUND SURFACE PREPARATION FOR FILL

A. All vegetation, roots, brush, heavy sods, heavy growth of grass, decayed vegetable matter, rubbish, and other unsuitable material within the areas to be filled shall be stripped and removed prior to beginning the fill operation.

B. Sloped ground surfaces steeper than 1 vertical to 4 horizontal, on which fill is to be placed shall be plowed, stepped, or benched, or broken up as directed, in such a manner where fill material will bond with the existing surface.

C. Surfaces on which fill is to be placed and compacted shall be wetted or dried as may be required to obtain the specified compaction.

3.4 FILL

A. Shall be placed in successive horizontal layers 8 inches to 12 inches in loose depth for the full width of the cross–section and compacted as required.

3.5 FINISHED GRADING

A. All areas covered by the project including excavated and filled sections and adjacent transition areas shall be smooth graded and free from irregular surface changes.

B. Degree of finish shall be that ordinarily obtainable from either blade–grader or scraper operations, supplemented with hand raking and finishing, except as otherwise specified.

C. Unpaved areas to within 0.1 feet of elevations shown on the drawings provided such deviation does not create low spots that do not drain.

D. Paved Areas – Subgrade to within 0.05 feet of the drawing elevations less the compacted thickness of the base and paving.

E. Ditches and lagoon banks shall be finished graded, dressed, and seeded within 14 calendar days of work to reduce erosion and permit adequate drainage.

F. Portland Cement Pervious Pavement:

1. Subgrade Materials – The top 6 inches shall be composed of granular or gravely soil predominantly sandy with no more than a moderate amount of silt or clay.

2. Subgrade Permeability – Prior to placement of Portland Cement Pervious Pavement, the subgrade shall be tested for rate of permeability by double ring infiltrometer, or other suitable test of subgrade soil permeability. The tested permeability must reasonably compare to design permeability.

3. Subgrade Support – Shall be compacted by a mechanical vibratory compactor to a minimum density of 92% of a maximum dry density as established by ASTM D 1557 or AASHTO T 180.

   If fill material is required to bring the subgrade to final elevation, it shall be clean and free of deleterious materials. It shall be placed in 8 inch maximum layers, and compacted by a mechanical vibratory compactor to a minimum density of 92% of a maximum dry density as established by ASTM D 1557 or AASHTO T 180.

4. Subgrade Moisture – Subgrade shall be in a moist condition (within +/– 3% of optimum moisture content as determined by modified compaction test ASTM D 1557 or AASHTO T 180).

3.6 DISPOSAL OF WASTE MATERIAL

A. All vegetation, roots, brush, sod, broken pavements, curb and gutter, rubbish, and other unsuitable or surplus material stripped or removed from limits of construction shall be disposed of by the Contractor.

3.7 PROTECTION

A. Graded areas shall be protected from traffic, erosion, settlement, or any washing away occurring from any cause prior to acceptance.

B. Contractor shall be responsible for protection of below grade utilities shown on the drawings or indicated by the Owner at all times during earthwork operations.

C. Repair or re–establishment of graded areas prior to final acceptance shall be at the Contractors expense.

D. Site drainage shall be provided and maintained by Contractor during construction until final acceptance of the project. Drainage may be by supplemental ditching, or pumping if necessary, prior to completion of permanent site drainage.

3.8 DRAINAGE

A. Contractor shall be responsible for providing surface drainage away from all construction areas. This shall include maintenance of any existing ditches or those constructed in the immediate vicinity of the work. Contractor shall provide proper and effective measures to prevent siltation of wetlands, streams, and ditches on both the Owner's property, and those properties downstream.

3.9 FIELD QUALITY CONTROL

A. Compaction testing shall be performed in accordance with ASTM D 6938. Where tests indicate the backfill does not meet specified requirements, the backfill shall be reworked or removed and replaced, and then retested at the Contractor's expense.

B. Unpaved areas – at least 90% of maximum laboratory density within 2% optimum moisture content unless otherwise approved by the Engineer.

C. Paved Areas and Under Structures – top 6 inch layer of subbase to at least 98% of maximum laboratory density within 2% optimum moisture content. Layers below top 6 inches shall be compacted to 95% of maximum laboratory density within 2% optimum moisture content.

D. Rolling and compaction equipment and methods shall be subject to acceptance by the Engineer. Acceptance in no way relieves Contractor of the responsibility to perform in correct and timely means.

E. Number of Tests – Under paved areas, no less than one density test per horizontal layer per 5,000 square feet of subbase shall be made. In unpaved areas, no less than one density test per horizontal layer per 10,000 square feet of fill area shall be made. Under curb and gutter, no less than one density test per every 300 linear feet.

3.10 PROOF ROLLING

A. Shall be required on the subbase of all curb and gutter and paved areas and on the base of all paved areas where designated by the Engineer. Proof rolling shall take place after all underground utilities are installed and backfilled. The operation shall consist of rolling the subbase or base with a fully loaded 10 wheeled dump truck. A full load shall consist of 10 to 12 cubic yards of soil or rock. The dump truck shall be capable of traveling at a speed of two to five miles per hour and be in sound mechanical shape with no exhaust leaks or smoking from burning oil. The Engineer shall determine number of passes and areas rolled.

END OF SECTION

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SECTION 02210

SOIL EROSION CONTROL

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Special Conditions apply to this section.

1.2 DESCRIPTION OF WORK

A. Extent of soil erosion control work includes all measures necessary to meet the requirements of this section.

Erosion and sediment control measures shall be installed prior to any construction activity.

Soil erosion and sediment control measures shall include all temporary and permanent means of protection and trapping soils of the construction site during land disturbing activity. Activity covered in this contract shall meet standards of NPDES General Permit for the state where work is performed.

1.3 PURPOSES

A. Contractor is to achieve the following goals:

1. Minimize soil exposure by proper timing of grading and construction.

2. Retain existing vegetation whenever feasible.

3. Vegetate and mulch denuded areas as soon as possible.

4. Divert runoff away from denuded areas.

5. Minimize length and steepness of slopes when it is practical.

6. Reduce runoff velocities with sediment barriers or by increasing roughness with stone.

7. Trap sediment on site.

8. Inspect and maintain erosion control measures.

1.4 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in the manufacture of soil erosion control systems products of types and sizes required, whose materials have been in satisfactory use for not less than 5 years.

B. Codes and Standards: Comply with all applicable Local, State and Federal Standards pertaining to soil erosion control.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instruction for soil erosion control materials and products.

1.6 MEASUREMENT AND PAYMENT

A. No unit measurements will be made for soil erosion control. Payment will be made at the lump sum price as shown on the bid proposal. The cost of soil erosion control shall include all equipment, labor and materials necessary to comply with the State of South Carolina Erosion and Sediment Control Program.

PART 2 – PRODUCTS

2.1 GRASSING MATERIALS

A. Refer to Section 02902 – Grassing.

1. General: All grass seed shall be free from noxious weeds, grade A recent crop, recleaned and treated with appropriate fungicide at time of mixture. Deliver to site in original sealed containers with dealer's guarantee as to year grown, percentage of purity, percentage of germination and date of the test by which percentages of purity and germination were determined. All seed sown shall have a date of test within six months of the date of sowing.

2. Type of Seed: Either Annual Rye or Common Bermuda Grass seed will be used depending on time of year in which seeding is to occur.

3. Mulch: Straw.

4. Fertilizer: Commercial balanced 4–12–12 fertilizer.

2.2 HAY BALES

A. Standard size, densely baled straw or hay wrapped with synthetic or wire bands (two minimum per bale).

2.3 SILT FENCE

A. Silt fence shall be a woven geotextile fabric sheet. Fabric shall be a synthetic polymer composed of at least 85% by weight propylene, ethylene, amide, ester, or vinylidene chloride, and shall contain stabilizer and/or inhibitors added to the base plastic to make filaments resistant to deterioration due to ultra–violet and/or heat exposure. Fabric should be finished so the filaments will retain their relative position with respect to each other. Fabric shall be free of defects, rips, holes, or flaws.

Fabric shall meet the following requirements:

Woven Fabrics	
Grab Strength	90 lbs.
Burst Strength	175 PSI
UV Resistance	80%

2.4 CHEMICALS FOR DUST CONTROL

A. Calcium Chloride, Anionic Asphalt Emulsion, latex Emulsion or Resin–in–Water Emulsion may be used for dust control.

2.5 RIP–RAP

A. Shall be hard quarry or field stone of such quality the pieces will not disintegrate on exposure to water, sunlight, or weather. Stone shall range in weight from a minimum of 25 pounds to a maximum of 125 pounds. At least 50 percent of the stone shall weigh more than 60 pounds. The stone shall have a minimum dimension of 12 inches.

2.6 PRODUCT REVIEW

A. Contractor shall provide the Engineer with a complete description of all products before ordering. Engineer will review all products before they are ordered.

PART 3 – EXECUTION

3.1 GENERAL

A. All disturbed soil areas except those to support paving shall be graded and protected from erosion by grassing. Disturbed areas must be grassed within 14 days of work ending unless work is to begin again before 21 days. Storm water conveyance systems shall have sediment barriers installed at all entrances, intersections, change in direction and discharge points.

3.2 GRASSING

A. Refer to Section 02902 – Grassing.

3.3 SEDIMENT BARRIERS

A. Hay Bales for Sheet Flow Applications:

1. Excavate a 4-inch-deep trench the width of a bale and length of proposed barrier. Barrier should be parallel to the slope. Place barrier 5 to 6 feet away from toe of slope, unless otherwise instructed.

2. Place bales in the trench with their ends tightly abutting. Corner abutment is not acceptable. A tight fit is important to prevent sediment from escaping through spaces between the bales.

3. Backfill the trench with previously excavated soil and compact it. Backfill soil should conform to ground level on downhill side of barrier and should be built up to 4 inches above ground on uphill side of bales.

4. Inspect and repair or replace damaged bales promptly. Remove hay bales when uphill sloped areas have been permanently stabilized.

B. Rock Ditch Check

1. Excavate a 6-inch-deep trench the width and length of proposed barrier. Install a non–woven geotextile fabric in the trench before placing rock for the ditch check.

2. The body of the ditch check shall be constructed of 12-inch rip–rap. The upstream face may be covered with 1–inch washed stone.

3. Ditch checks shall not exceed a height of 2 feet at centerline of the channel and have a minimum top flow length of 2 feet.

4. Rip–rap shall be placed over the channel banks to prevent water from flowing around ditch check. Rock must be installed by hand or mechanical placement (no dumping of rock) to achieve complete coverage of the ditch and ensure the center of the check is lower than the edges.

5. The maximum spacing between ditch checks shall be where the toe of the upstream check is at the same elevation as the top of the downstream check.

6. Contractor shall maintain ditch checks as required by State regulations.

3.4 SILT FENCE

A. Silt fence shall be placed at approximate location shown and installed in accordance with the detail on the construction drawings. Contractor shall maintain silt fence as required by state regulations.

3.5 DUST CONTROL

A. Dust raised from vehicular traffic will be controlled by wetting down access road with water or by the use of a deliquescent chemical, such as calcium chloride, if relative humidity is over 30%. Chemicals shall be applied in accordance with manufacturer's recommendations.

B. Contractor shall use all means necessary to control dust on and near the work, or off–site borrow areas when dust is caused by operations during performance of work or if resulting from the condition in which any subcontractor leaves the site. Contractor shall thoroughly treat all surfaces required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of work on site.

3.6 SEDIMENT BASIN

A. A sediment basin equal in volume to 3,600 cubic feet per disturbed acre is required. The sediment basin/lagoon adjacent to the outfall for the site shall be constructed and stabilized prior to any additional land disturbed activity.

3.7 RIP–RAP

A. Rip–Rap shall be placed at the locations shown and installed in accordance with the detail on the construction drawings.

3.8 CONSTRUCTION EXIT

A. Construct exit at the location shown per detail on the construction drawings. Contractor shall maintain construction exit as required by state regulations.

3.9 INLET PROTECTION

A. Install inlet protection per detail on the construction drawings. Contractor shall maintain inlet protection as required by state regulations until all disturbed surfaces are stabilized.

END OF SECTION

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SECTION 02211

EROSION, SEDIMENTATION, AND POLLUTION CONTROL

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Soil erosion, sediment and pollution control measures shall include all temporary and permanent means of soil protection, trapping soils and containment of pollutants on the construction site during land disturbing activities. Activities covered in this section are regulated by the Manual for Erosion and Sediment Control in South Carolina and South Carolina's National Pollutant Discharge Elimination System Permit (NPDES), General Permit No. SCR100000.

B. Reporting

C. Sampling

1.2 RELATED SECTIONS

A. Section 02110 – Site Clearing

B. Section 02204 – Earthwork

C. Section 02667 – Water Distribution System

D. Section 02720 – Storm Drainage

E. Section 02731 – Wastewater Collection System

1.3 PURPOSES

A. The purpose of this section is to achieve the following goals:

1. Minimize soil exposure by proper timing of clearing grading and construction.

2. Retain existing vegetation whenever feasible.

3. Vegetate and mulch disturbed areas as soon as possible.

4. Divert runoff away from disturbed areas.

5. Minimize length and steepness of slopes when it is practical.

6. Reduce runoff velocities with check dams or surface roughing.

7. Trap sediment on site.

8. Inspect and maintain erosion, sedimentation and pollution control measures.

9. Report on condition of Best Management Practices (BMPs).

10. Sample site run off per South Carolina's NPDES Permit.

1.4 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of soil erosion, sedimentation and pollution control systems products of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

Codes and Standards: Comply with all applicable Local, State and Federal Standards pertaining to soil erosion, sedimentation and pollution control.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instruction for soil erosion, sedimentation and pollution control materials and products.

1.6 MEASUREMENT AND PAYMENT

A. No unit measurements will be made for soil erosion control. Payment will be made at the lump sum price as shown on the bid proposal. The cost of soil erosion control shall include all equipment, labor, maintenance, monitoring, reporting, and materials necessary to comply with the State of South Carolina NPDES Permit.

PART 2 – PRODUCTS

2.1 VEGETATIVE MATERIALS

A. Mulch

1. Dry straw or hay.

2. Wood chips, sawdust or bark.

3. Cutback asphalt.

B. Temporary Seeding

1. Annual Ryegrass

2. Browntop Millet

C. Permanent Seeding

1. Common Bermuda

2. Centipede

D. Sod

1. Common Bermuda

2. Centipede

3. St. Augustine

E. Fertilizer

1. Commercial 6-12-12

2.2 STRUCTURAL MATERIALS

A. Check Dam

1. Stone (2" – 10")

2. Bales of densely baled hay or straw wrapped with synthetic or wire bands (two minimum per bale).

B. Construction Exit

1. Minimum 20' x 50' x 0.5' layer of 1.5" to 3.5" stone with a geotextile underliner.

C. Filter Ring

1. Minimum 2' high stone ring. Stone shall be no smaller than 3" to 5" when utilized at storm drain inlets and pond outlets with pipe diameters less than 12".

2. Minimum 2' high stone ring. Stone shall be no smaller than 10" to 15" when utilized at storm drain inlets and pond outlets with pipe diameters greater than 12".

D. Sediment Barrier

1. Bales of densely baled hay or straw wrapped with synthetic or wire bands (two minimum per bale).

2. Silt Fence – Shall be a woven geotextile fabric sheet of plastic yarn composed of a long chain synthetic polymer with at least 85% by weight propylene, ethylene, amide, ester or vinylidene chloride, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultra-violet and/or heat exposure. The fabric shall be finished so the filaments will retain their relative position with respect to each other.

The fabric shall be free of defects, rips, holes or flaws. The manufacturer shall have either an approved color mark yarn in the fabric or label the fabricated silt fence with both the manufacturer and fabric name every 100'.

The fabric shall meet the following requirements:

Grab Strength	90 lbs.
Mullen Burst Strength	150 lbs.
UV Resistance	80 %

E. Inlet Sediment Trap

1. Silt fence (Type C) supported by steel posts.

2. Baffle Box – Constructed of 2" x 4" boards spaced a maximum of 1" apart or plywood with weep holes 2" in diameter (See detail).

3. Sod Inlet Protection – Four - 1-foot wide strips of sod on each side of the inlet (See detail).

4. Curb Inlet Protection – Eight-inch concrete blocks wrapped in filter fabric, placed in front of a curb inlet.

F. Storm Drain Outlet Protection

1. Geotextile fabric equivalent to Mirafi FW700.

2. Rip-rap (See detail for size).

2.3 CHEMICAL MATERIALS

A. Dust Control – Calcium Chloride, Anionic Asphalt Emulsion, Latex Emulsion or Resin-in-Water Emulsion.

B. Anionic Polyacrylamide (PAM) – Consult state and local laws concerning the regulations of this chemical.

PART 3 – EXECUTION

3.1 GENERAL

A. All disturbed soil areas except those to support paving shall be graded and protected from erosion with vegetative materials. Sedimentation discharge from the construction site into natural drainage ways and storm drainage systems shall be prevented by means of vegetative measures and temporary structural practices. These vegetative measures and structural practices are known as Best Management Practices (BMPs). Rainfall, pollution control measures and construction exit condition shall be monitored and reported on each day when construction activities take place.

Erosion and sedimentation control measures shall be monitored and reported on every seven days and within 24 hours of a qualifying rainfall event of 0.5 inches or more. Sampling of construction site discharging water shall be sampled within 45 minutes of a qualifying rainfall event and analyzed immediately or no later than 48 hours after collection. The above reports shall be submitted to the South Carolina DHEC by the fifteenth day of the month following the reporting period.

B. The Contractor (Operator) is considered a "Primary Permittee" and shall submit a Notice of Intent (NOI) in accordance with General Permit No. SCR100000, at least 14 days prior to the commencement of construction activities. Contractor shall retain a copy of the Erosion, Sedimentation, and Pollution Control Plan and Comprehensive Monitoring Program required by above permit at construction site or be readily available at a designated alternate location from date of project initiation to date of final stabilization. Copies of all Notice of Intent, Notice of Termination, plans, monitoring reports and all other records required by above permit shall be retained by Contractor for a period of at least three years from date the site is finally stabilized. Copies of Notice of Intent (NOI), Notice of Termination (NOT) and General Permit Number SCR100000 are found at the end of this section.

3.2 ON-SITE OBSERVATION

A. Engineer is required by General Permit No. SCR100000 to check the installation of Erosion, Sedimentation and Pollution Control measures within one week after initial construction activities commence. The Contractor shall notify Engineer within 24 hours of control measures installation for the above site visit. Engineer, within the above parameters, shall check subsequent installation of control measures.

3.3 VEGETATIVE PRACTICES

A. Mulch

1. Dry straw or hay shall be applied at a depth of 2 to 4 inches by hand or mechanical equipment providing complete soil coverage. Straw or hay shall be anchored immediately after application. Straw or hay can be anchored with a disk harrow, packer disk or emulsified asphalt.

2. Wood chips, sawdust or bark shall be applied at a depth of 2 to 3 inches by hand or mechanical equipment providing complete soil coverage. Netting of the appropriate size shall be used to anchor the above materials.

3. Cutback asphalt shall be applied at 1,200 gallons per acre or 1/4 gallon per square yard.

B. Seeding

1. Seed shall be applied uniformly by hand, cyclone seeder, drill, cultipacker seeder or hydraulic seeder. Drill or cultipacker seeders shall place seed 1/4" to 1/2" deep. Soil shall be raked lightly to cover seed with soil if seeded by hand.

2. During times of drought, water shall be applied at a rate not causing runoff and erosion. The soil shall be thoroughly wetted to depth insuring germination of the seed. Subsequent applications of water shall be made when needed.

3. Refer to Section 02902 – Grassing for additional seeding requirements.

C. Sodding

1. Bring soil surface to final grade. Clear surface of trash, woody debris stones and dirt clods larger than 1". Mix fertilizer into soil surface. Apply sod to soil when surface is not muddy or frozen. Lay sod with tight joints and in straight lines. Do not overlap joints. Stagger joints and do not stretch sod. On slopes steeper than 3:1, sod shall be anchored with pins or other approved methods. Installed sod shall be rolled or tamped to provide good contact between sod and soil. Irrigate sod and soil to a depth of 4" immediately after installation. Irrigation shall be used to supplement rainfall for a minimum of 2-3 weeks.

2. Refer to Section 02902 – Grassing for additional sodding requirements.

3.4 STRUCTURAL MEASURES

A. Check Dam

1. Stone – Shall be constructed of graded size 2-10 inch stone underlayed with a geotextile fabric. Mechanical or hand placement shall be required to insure complete coverage of entire width of ditch or swale and center of dam is lower than edges. Sediment shall be removed when it reaches a depth of one-half the original dam height or before.

2. Haybale – Shall be staked and embedded a minimum of 4" and may be used as temporary check dams in concentrated flow areas while vegetation is becoming established. They should not be used where the drainage area exceeds one acre. Sediment shall be removed when it reaches a depth of one-half the original dam height or before.

B. Construction Exit

1. A stone stabilized pad shall be located at any point where traffic will be leaving the construction site to a public right-of-way, street, alley, sidewalk, parking area or any other area where there is a transition from bare soil to a paved area. The pad shall be constructed of 1.5" to 3.5" stone, having a minimum thickness of 6" and not less than 20' wide and 50' long. The pad shall be underlayed with a geotextile fabric. The pad shall be maintained in a condition, which will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing with 1.5" to 3.5" stone. All materials spilled, dropped, washed or tracked from vehicles or site onto roadways or into storm drains must be removed immediately.

C. Filter Ring

1. Shall surround all sides of the structure receiving runoff from disturbed areas. It shall be placed a minimum of 4' from the structure. It may also be used below storm drains discharging into detention ponds, creating a centralized area for sediment accumulation. When utilized below a storm drain outlet, it shall be placed such that it does not create a condition causing water to back-up into the storm drain and inhibit the function of the storm drain system. The larger stone can be faced with smaller filter stone on the upstream side for added sediment filtering capabilities. Mechanical or hand placement of stone shall be required to uniformly surround the structure.

2. Filter ring must be kept clear of trash and debris. This requires continuous monitoring and maintenance, which includes sediment removal when one-half full. Filter rings are temporary and should be removed when the site has been stabilized.

D. Sediment Barrier

1. Hay or straw bales may be used in areas of low sheet flow rates. They shall not be use if the project duration is expected to exceed three months. Bales shall be placed in a single row, lengthwise, and embedded in the soil to a depth of 4". Bales must be securely anchored in place by stakes or bars driven through the bales or by other acceptable means to prevent displacement. Bales shall be placed so the binding wire or twine around the bale will not touch the soil. Sediment shall be removed once it has accumulated to one-half the original height of the barrier. Barriers shall remain in place until disturbed areas have been permanently stabilized. All sediment accumulated at the barrier shall be removed and properly disposed of before the barrier is removed. The slope lengths contributing runoff to a bale barrier cannot exceed those listed below.

Land Slope (Percent)	Maximum Slope Length Above Bale (Feet)
< 2	75
2 to 5	50
5 to 10	35
10 to 20	20
> 20	10

2. Silt fence may be used in areas of higher sheet flow rates. The drainage area shall not exceed ¼ acre for every 100' of silt fence. **Silt fence shall not be installed across streams, ditches, waterways or other concentrated flow areas.** Silt fence shall be installed according to this specification, as shown on the construction drawings or as directed by the Engineer. See details on the construction drawings for installation requirements.

a. Type A – A 36" wide filter fabric silt fence shall be used on construction sites where the life of the project is greater than or equal to six months.

b. Type B – A 22" wide filter fabric silt fence shall be limited to use on minor projects, such as residential home sites or small commercial developments where permanent stabilization will be achieved in less than six months.

c. Type C – A 36" wide filter fabric silt fence with wire reinforcement shall be used where runoff flows or velocities are particularly high or where slopes exceed a vertical height of 10'. Along stream buffers and other sensitive areas, two rows of Type C silt fence or one row of Type C silt fence backed by hay bales shall be used.

3. Where all runoff is to be stored behind the silt fence (where no stormwater disposal system is present), the slope lengths contributing runoff to a silt fence barrier cannot exceed those listed below.

Land Slope (Percent)	Maximum Slope Length Above Fence (Feet)
< 2	100
2 to 5	75
5 to 10	50
10 to 20	25
> 20*	15

*In areas where the slope is greater than 20%, a flat area length of 10' between the toe of the slope and the fence shall be provided.

4. Sediment shall be removed once it has accumulated to one-half the original height of the barrier. Filter fabric shall be replaced whenever it has deteriorated to such an extent that the effectiveness of the fabric is reduced (approximately six months). Barriers shall remain in place until disturbed areas have been permanently stabilized. All sediment accumulated at the barrier shall be removed and properly disposed of before the barrier is removed.

E. Inlet Sediment Trap

1. Shall be installed at or around all storm drain inlets receiving runoff from disturbed areas. Sediment traps must be self draining unless they are otherwise protected in an approved manner that will not present a safety hazard. The drainage area entering the inlet sediment trap shall be no greater than one acre. Sediment traps may be constructed on natural ground surface, on an excavated surface or on machine compacted fill provided they have a non-erodible outlet.

2. Type C silt fence supported by steel posts may be used where the inlet drains a relatively flat area (slope no greater than 5%) and shall not apply to inlets receiving concentrated flows, such as in street or highway medians. The stakes shall be spaced evenly around the perimeter of the inlet a maximum of 3' apart and securely driven into the ground, approximately 18" deep. The fabric shall be entrenched 12" and backfilled with crushed stone or compacted soil. Fabric and wire shall be securely fastened to the posts and fabric ends must be overlapped a minimum of 18" or wrapped together around a post to provide a continuous fabric barrier around the inlet. The trap shall be inspected daily and after each rain. Repairs are to be made as needed. Sediment shall be removed once it has accumulated to one-half the height of the trap. **Sediment shall not be washed into the inlet.** It shall be removed from the sediment trap and disposed of and stabilized so it will not enter the inlet again. When the contributing drainage area has been permanently stabilized, all materials and any sediment shall be removed and either salvaged or disposed of properly. The disturbed area shall be brought to proper grade, smoothed and compacted. Appropriately stabilize all disturbed areas around the inlet.

3. A baffle box shall be used for inlets receiving runoff with a higher volume or velocity. The box shall be constructed of 2" x 4" boards spaced a maximum of 1" apart or of plywood with weep holes 2" in diameter. The weep holes shall be placed approximately 6" on center vertically and horizontally. The entire box shall be wrapped in Type C filter fabric that is entrenched 12" and backfilled. Gravel shall be placed around the box to a depth of 2" to 4". The trap shall be inspected daily and after each rain. Repairs are to be made as needed. Sediment shall be removed once it has accumulated to one-half the height of the trap. **Sediment shall not be washed into the inlet.** It shall be removed from the sediment trap and disposed of and stabilized so it will not enter the inlet again. When the contributing drainage area has been permanently stabilized, all materials and any sediment shall be removed and either salvaged or disposed of properly. The disturbed area shall be brought to proper grade, smoothed and compacted. Appropriately stabilize all disturbed areas around the inlet.

4. Sod Inlet Protection shall be used only at the time of permanent seeding, to protect the inlet from sediment and mulch material until permanent vegetation has become established. The sod shall be place to form a turf mat covering the soil for a distance of 4' from each side of the inlet structure. Sod strips shall be staggered so adjacent strip ends are not aligned. Re-sod areas where an adequate stand of sod is not obtained. New sod should be mowed sparingly. Grass height should not be less than 2" to 3".

5. Curb Inlet Protection shall be used on curb inlets receiving runoff from disturbed areas once pavement has been installed. Place 8" concrete blocks wrapped in filter fabric in front of the curb inlet opening. A gap of approximately 4" shall be left between the inlet filter and the inlet to allow for overflow and prevention of hazardous ponding in the roadway.

This method of inlet protection shall be removed if a safety hazard is created. Sediment shall be removed from curb inlet protection immediately.

F. Storm Drain Outlet Protection

1. Outlet protection aprons shall be constructed at all storm drain outlets, road culverts, paved channel outlets discharging into natural or constructed channels. Apron will extend from end of the conduit, channel or structure to the point of entry into an existing stream or publicly maintained drainage system. Apron length, width and stone size shall conform to details on the construction drawings. Apron shall be constructed with no slope along its length. Invert elevation of the downstream end of apron shall be equal to the elevation of the receiving channel invert. There shall be no overfall at the end of apron. Apron shall be located so there are no bends in the horizontal alignment.
2. Subgrade for geotextile fabric and rip-rap shall follow required lines and grades shown on the construction drawings. Compact any subgrade fill required to the density of surrounding undisturbed material. Low areas in subgrade on undisturbed soil may also be filled by increasing rip-rap thickness. Geotextile fabric shall be protected from punching or tearing during installation. Repair any damage by removing rip-rap and placing another piece of fabric over the damaged area. All connecting joints shall overlap a minimum of 1'. If damage is extensive, replace entire geotextile fabric. Rip-rap shall be placed by equipment or hand. Minimum thickness of rip-rap shall be 1.5 times the maximum stone diameter. Immediately after construction, stabilize all disturbed areas around apron with vegetation.

3. Check outlet apron after heavy rains to see if any erosion around or below the rip-rap has taken or if stones have been dislodged. Immediately make all needed repairs to prevent further damage.

3.5 CHEMICAL MEASURES

A. Dust Control

1. Dust raised from vehicular traffic shall be controlled by wetting down roads with water or by the use of chemicals. Chemicals shall be applied in accordance with the manufacturer's recommendations.

B. Soil Binding

1. This temporary practice is intended for direct soil surface application to sites where the timely establishment of vegetation may not be feasible or where vegetative cover is absent or inadequate. **This temporary practice is not intended for application to surface waters of the state.** It is intended for application within construction storm water ditches and storm drains that feed into previously constructed sediment ponds or basins.

2. Anionic Polyacrylamide (PAM) is available in emulsions, powders, gel bars and logs. It is required that other Best Management Practices be used in combination with anionic PAM. The use of seed and mulch for additional erosion protection beyond the life of anionic PAM is recommended. Use 50' setbacks when applying anionic PAM near natural water bodies. Never add water to PAM, add PAM slowly to water. If water is added to PAM, globs can form which can clog dispensers. This signifies incomplete dissolving of PAM and therefore increases the risk of under application. Application rates shall conform to manufacturer's guidelines. **The maximum application rate of PAM, in pure form, shall not exceed 200pounds/acre/year.** Contractors using anionic PAM shall obtain and follow all Material Safety Data Sheet requirements and manufacturer's recommendations. Gel bars and logs of anionic PAM mixtures may be used in ditch systems. This application shall meet the same testing requirements as anionic PAM emulsions and powders. Maintenance will consist of reapplying anionic PAM to disturbed areas, including high traffic areas, which interfere in the performance of this practice.

3.6 MONITORING AND REPORTING

A. Each day, when any type of construction activity takes place on the construction site, Contractor's qualified personnel shall monitor and record rainfall, inspect all areas where petroleum products are stored, used or handled for spills and leaks from vehicles and equipment and check all locations where vehicles enter or exit the site for evidence of off site sediment tracking. These inspections shall be conducted until a Notice of Termination (NOT) is submitted. For linear construction where a phased activity is conducted, this paragraph applies to the active phase(s) of work.

B. Once every seven calendar days and within 24 hours of the end of a storm 0.5 inches or greater, Contractor's qualified personnel shall inspect disturbed areas of the construction site that have not undergone final stabilization, areas used for storage of materials that are exposed to precipitation that have not undergone final stabilization and structural control measures (BMPs). Erosion and sediment control measures identified in the Erosion, Sedimentation and Pollution Control Plan shall be observed to ensure they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving water(s). These inspections must be conducted until a Notice of Termination is submitted. For linear construction where a phase activity is conducted, this paragraph applies to the active phase(s) of work.

C. Contractor's qualified personnel shall inspect a least once per month during the term of the General Permit, areas of the construction site having undergone final stabilization. These areas hall be inspected for evidence of, or the potential for, pollutants entering the drainage system and receiving water(s). Erosion and sediment control measure shall be observed to ensure they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measure are effective in preventing significant impacts to receiving water(s). For linear construction, monthly inspections in accordance with this paragraph shall be made for those phases on which final stabilization has been completed.

D. Contractor shall prepare a report summarizing the scope of inspections, name(s) of qualified personnel making the inspections, date(s) of inspections, major observations relating to the implementation of the Erosion, Sedimentation and Pollution Control Plan and any actions taken. This report shall be retained on the construction site or be readily available at a designated alternate location until the entire site or portion of a construction project that was phased, has undergone final stabilization and a Notice of Termination (NOT) is submitted to EPD. Such reports shall identify any incidents of non-compliance. Where the report does not identify any incidents of non-compliance, the re report shall contain a certification that the facility is in compliance with the Erosion, Sedimentation and Pollution Control Plan and the General Permit. The report shall be signed in accordance with the General Permit.

3.7 SAMPLING AND ANALYSIS

A. Contractor must manually or automatically sample in accordance with the Comprehensive Monitoring Plan (CMP) at least once for each rainfall event described below. For a qualifying event, samples must be taken within forty-five (45) minutes of:

1. The accumulation of the minimum amount of rainfall, if the storm water discharge to a monitored receiving water or from a monitored outfall has begun at or prior to the accumulation.

2. The beginning of any storm water discharge to a monitored receiving water or from a monitored outfall, if the discharge begins after the accumulation of the minimum amount of rainfall.

However, where manual and automatic sampling are impossible (as defined in the permit), or are beyond the Contractor's control, the Contractor shall take samples as soon as possible, but in no case more than 12 hours after the beginning of the storm water discharge.

B. Sampling shall occur for the following events:

1. For each area of the site discharging to a receiving stream, the first rain event reaching or exceeding 0.5 inch and allows for monitoring during normal business hours* (Monday thru Friday, 8:00 a.m. to 5:00 p.m. and Saturday 8:00 a.m. to 5:00 p.m. when construction activity is being conducted by the Primary permittee) occurring after all clearing and grubbing operations are completed in the drainage area of the location selected as the sampling location;

2. In addition to (1) above, for each area of the site discharging to a receiving stream, the first rain event reaching or exceeding 0.5 inch and allows for monitoring during normal business hours* occurring either 90 days after the first sampling event or after all mass grading operations are completed in the drainage area of the location selected as the sampling location, whichever comes first.

3. At the time of the sampling performed pursuant to (1) and (2) above, if BMPs are found to be properly designed, installed, and maintained, no further action is required. If BMPs in any area of the site discharging to a receiving stream are not properly designed, installed, and maintained, corrective action shall be defined and implemented within two business days, and turbidity samples shall be taken from discharges of the same area for each subsequent rain event reaching or exceeding 0.5 inch during normal business hours* until the selected turbidity standard is attained, or until post-storm event inspections determine BMPs are properly designed, installed, and maintained;

4. Existing construction activities, i.e., those occurring on or before the effective date of this permit, having met the sampling required by (1) above shall sample in accordance with (2). Those existing construction activities having met the sampling required by (2) above shall not be required to conduct additional sampling other than as required by (3) above.

   * Note the Permittee may choose to meet the requirements of (1) and (2) above by collecting turbidity samples from any rain event reaching or exceeding 0.5 inch and allows for monitoring at any time of the day or week.

5. For linear construction, if at any time during the life of the project, BMPs have not been properly designed, installed or maintained for the construction activities that discharge into a receiving water which is not being sampled, the Contractor shall sample that receiving water for the first rainfall event greater than or equal to 0.5 inches thereafter and for every rainfall event greater than or equal to 0.5 inches until BMPs are properly designed, installed and maintained.

C. Sampling shall be collected by "grab samples" and the analysis of these samples must be conducted in accordance with methodology and test procedures established in the General Permit. Sample containers shall be labeled prior to collecting the samples. Samples shall be well mixed before transferring to a secondary container. Large mouth, well cleaned and rinsed glass or plastic jars shall be used for collecting samples. The jars shall be cleaned thoroughly to avoid contamination. Manual or automatic sampling shall be utilized. Samples required by the General Permit shall be analyzed immediately, but in no case later than 48 hours after collection. However, samples from automatic samplers must be collected no later than the next business day after their accumulation, unless flow through automated analysis is utilized. Samples are not required to be cooled. Samples taken for the purpose of compliance with the General Permit shall be representative of the monitored activity and representative of the water quality of the receiving water(s) and/or the storm water outfalls using the following minimum guidelines:

1. The upstream sample for each receiving water(s) must be taken immediately upstream of the confluence of the first storm water discharge from the permitted construction site but downstream of any other storm water discharges not associated with the site. Where appropriate, several upstream samples from across the receiving water(s) may need to be taken and the average turbidity of these samples used for an upstream turbidity value.

2. The downstream sample for each receiving water(s) must be taken downstream of the confluence of the last storm water discharge from the construction site but upstream of any other storm water discharge not associated with the site. Where appropriate, several downstream samples from across the receiving water(s) may need to be taken and the average turbidity of these samples used for a downstream turbidity value.

3. Samples shall be taken from the horizontal and vertical center of the receiving water(s) or the storm water outfall channel(s).

4. Care shall be taken to avoid stirring the bottom sediments in the receiving water(s) or in the outfall storm water channel(s).

5. Sampling container shall be held so the opening faces upstream.

6. Samples shall be kept from floating debris.

D. For all construction sites and common developments other than linear construction projects, the Contractor shall sample all receiving water(s), or all outfall(s) or a combination of receiving water(s) and outfall(s). For linear construction projects, the Contractor must sample all perennial and intermittent streams and other water bodies shown on an USGS topographic map and all other field verified perennial and intermittent streams and other water bodies, or all outfalls into such streams and other water bodies, or a combination thereof.

E. Contractor shall provide and implement all safety equipment and procedures necessary for sampling during hazardous weather conditions and in the event of biological, chemical or physical hazards

F. Contractor shall submit a summary of the monitoring results to the EPD at the address shown in the General Permit by the fifteenth day of the month following the reporting period. For a monitoring period during which no qualifying rainfall events occur, a monitoring report must be submitted stating such. Monitoring periods are calendar months beginning with the first month after the effective date of the General Permit. Monitoring reports shall be signed in accordance with the General Permit and submitted to EPD until such time as a NOT is submitted.

G. Contractor must retain copies of all monitoring results and monitoring information reported. In addition to other record keeping requirements, the monitoring information shall include:

1. Date, exact place and time of sampling or measurements.

2. Name(s) of the individual(s) who performed the sampling and measurements.

3. Date(s) analyses were performed.

4. Time(s) analyses were initiated.

5. Name(s) of the individual(s) who performed the analyses.

6. References and written procedures, when available, for the analytical techniques or methods used. A quality control/quality assurance program must be included in the written procedures.

7. The results of such analyses, including the bench sheets, instrument readouts, computer disks or tapes, used to determine these results.

8. Results exceeding 1,000 NTU shall be reported as "Exceeds 1,000 NTU."

H. Suggested monitoring and report forms are found at the end of this section.

END OF SECTION

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SECTION 02231 – AGGREGATE BASE COURSE

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SECTION 02231

AGGREGATE BASE COURSE

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Aggregate base course.

1.2 RELATED SECTIONS

A. Section 01400 – Quality Control.

B. Section 02204 – Earthwork

C. Section 02512 – Asphaltic Concrete Binder/Surface Courses

1.3 MEASUREMENT AND PAYMENT

A. Aggregate Base Course: Payment will be made at the contract unit price. Payment will include supplying all material, labor, and equipment, stockpiling, scarifying substrate surface, placing where required, and compacting.

B. Prime Coat: Bituminous prime coat will not be measured for separate payment. All costs connected with applying prime coat will be included in the unit price bid for Aggregate Base Course.

1.4 REFERENCES (LATEST REVISION)

A. ASTM C 131 – Resistance to Degradation of Small–Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine.

B. ASTM D 1557 – Laboratory Compaction Characteristics of Soil Using Modified Effort.

C. ASTM D 3740 – Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock Used in Engineering Design and Construction.

D. ASTM D 6938 – In–Place Density and Water Content of Soil and Soil–Aggregate by Nuclear Methods (Shallow Depth).

E. ASTM E 329 – Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with the South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction.

1.6 TESTING

A. Laboratory tests for moisture density relationship for fill materials shall be in accordance with ASTM D 1557, (Modified Proctor).

B. In place density tests in accordance with ASTM D 6938.

C. Testing laboratory shall operate in accordance with ASTM D 3740 and E 329 and be acceptable to the Engineer.

D. Testing laboratory and Project Engineer/Project Representative shall be given a minimum of 48 hours notice prior to taking any tests.

E. Testing shall be Contractor's responsibility and performed at Contractor's expense by a commercial testing laboratory operating in accordance with subparagraph C above.

F. Test results shall be furnished to the Engineer prior to continuing with associated or subsequent work.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Aggregate shall consist of processed and blended crushed stone. Aggregates shall be free from lumps and balls of clay, organic matter, objectionable coatings, and other foreign material and shall be durable and sound. Coarse aggregate shall have a percentage of wear not to exceed 65% after 500 revolutions as determined by ASTM C 131. Aggregate shall meet applicable requirements of Section 305.2 in the South Carolina Department of Transportation Standard 2007 Specifications for Highway Construction. Material shall meet the following gradation and other requirements:

Granite Stone or Recycled Concrete	
Sieve Size	Percent by Weight Passing
2"	100
1–1/2"	95 – 100
1"	70 – 100
1/2"	48 – 75
# 4	30 – 60
# 30	11 – 30
#200	0 – 12
Liquid Limit	0 to 25
Plasticity Index	0 to 6

Marine Limestone	
Sieve Size	Percent by Weight Passing
2"	100
1–1/2"	95 – 100
1"	70 – 100
1/2"	50 – 85
# 4	30 – 60
# 30	17 – 38
#200	0 – 20
Liquid Limit	0 to 25
Plasticity Index	0 to 6

B. Prime Coat: Shall be EA–P Special, Emulsified asphalt, conforming to Section 407 of the South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify subbase has been tested, is dry, and slopes and elevations are correct.

B. ON SITE OBSERVATIONS OF WORK: The Owner's Representative or Engineer will have the right to require any portion of the work be completed in their presence and if the work is covered up after such instruction, it shall be exposed by the Contractor for observation at no additional cost to the Owner. However, if the Contractor notifies the Owner such work is scheduled, and the Owner fails to appear within 48 hours, the Contractor may proceed. All work completed and materials furnished shall be subject to review by the Owner, Engineer or Project Representative. Improper work shall be reconstructed, and all materials, which do not conform to the requirements of the specifications, shall be removed from the work upon notice being received from the Engineer for the rejection of such materials. Engineer shall have the right to mark rejected materials to distinguish them as such.

Contractor shall give the Owner, Project Engineer or Project Representative a minimum of 48 hours notice for all required observations or tests.

3.2 PREPARATION

A. Subbase shall be graded and shaped conforming to the lines, grades, and cross sections required and cleaned of all foreign substances prior to constructing base course. Do not place base on soft, muddy or frozen surfaces. Correct irregularities in subbase slope and elevation by scarifying, reshaping, and recompacting.

B. At the time of base course construction, subbase shall contain no frozen material.

C. Surface of subbase shall be checked by the Engineer or Project Representative for adequate compaction and surface tolerances. Ruts or soft yielding spots appearing in areas of subbase course having inadequate compaction, and areas not smooth or which vary in elevation more than 3/8 inch above or below required grade established on the plans, shall be corrected to the satisfaction of the Engineer or Project Representative. Base material shall not be placed until subbase has been properly prepared and test results have so indicated.

3.3 AGGREGATE PLACEMENT

A. Aggregate shall be placed in accordance with South Carolina Department of 2007 Transportation Standard Specifications for Highway Construction Section 305 and in accordance with all terms included in these specifications.

A. Level and contour surfaces to elevations and slopes indicated.

B. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.

C. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

D. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

E. While at optimum moisture (± 1–1/2%), compact base course with rollers capable of obtaining required density. Vibratory, flatwheel, and other rollers accepted by the Engineer may be used to obtain required compaction. Rolling shall continue until base is compacted to 98% of the maximum laboratory dry density as determined by ASTM D 1557. In–place density of the compacted base will be determined in accordance with ASTM D 6938.

3.4 PRIME COAT

A. Bituminous material for the prime coat shall be applied uniformly and accurately in quantities of not less than 0.15 gallons per square yard nor more than 0.30 gallons per square yard of base course. All irregularities in the base course surface shall be corrected prior to application of prime coat. Clean the base course of all mud, dirt, dust, and caked and loose material

B. Do not apply prime to a wet surface nor when temperature is below 40°F in the shade. Do not apply prime when rain threatens nor when weather conditions prevent proper construction and curing of prime coat.

C. The primed base should be adequately cured before the binder or surface course is laid. In general, a minimum of 48 hours should be allowed for complete curing. Ordinarily, proper surface condition of the prime is indicated by a slight change in the shiny black appearance to a slightly brown color.

3.5 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with an acceptable 10–foot straight edge.

B. Scheduled Compacted Thickness: Within 3/8 inch.

C. Variation from Design Elevation: Within 3/8 inch.

D. Depth measurements for compacted thickness shall be made by test holes through the base course. Where base course is deficient, correct such areas by scarifying, adding base material and recompacting as directed by the Engineer.

3.6 FIELD QUALITY CONTROL

A. Section 01400 – Quality Assurance: Field inspection.

B. Density and moisture testing will be performed in accordance with ASTM D 1557 and ASTM D 6938.

C. If tests indicate Work does not meet specified requirements, remove Work, replace, and retest.

D. Frequency of Tests:

1. Base Density and Thickness – One test per 5,000 square feet.

END OF SECTION

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SECTION 02512SC – ASPHALTIC CONCRETE BINDER/SURFACE COURSES

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SECTION 02512SC

ASPHALTIC CONCRETE BINDER/SURFACE COURSES

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Surface Course

B. Binder Course

1.2 RELATED SECTIONS

A. Section 01025 – Measurement and Payment

B. Section 01400 – Quality Control

C. Section 02204 – Earthwork

D. Section 02231 – Aggregate Base Course

1.3 MEASUREMENT AND PAYMENT

A. Omitted.

B. Asphaltic Concrete Surface Course: Will be paid for at the contract unit price per square yard of completed and accepted surface course for the thickness specified.

C. Tack Coat: Payment is inclusive of the contract unit price for Asphaltic Concrete Surface Course.

D. Payment for pavement and tack coat will be in full for preparing and cleaning, providing all materials, labor and equipment including placing, compacting and testing.

1.4 REFERENCES (LATEST REVISION)

A. ASTM D 946 – Penetration–Graded Asphalt–Cement for Use in Pavement Construction.

B. ASTM D 1188 – Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples.

C. ASTM D 1754 – Effects of Heat and Air on Asphaltic Materials (Thin–film Oven Test).

D. ASTM D 2726 – Bulk Specific Gravity and Density of Non–Absorptive Compacted Bituminous Mixtures.

E. ASTM D 2950 – Density of Bituminous Concrete in Place by Nuclear Methods.

F. ASTM D 3740 – Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock Used in Engineering Design and Construction.

G. ASTM E 329 – Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction.

B. Mixing Plant: Conform to South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction.

C. Method of Measurement for Handicap Parking and Access Aisle will be with a 24–inch digital smart–level. The 24–inch smart–level slope readings greater than specified tolerance within contract documents will be identified as non–compliant and not accepted.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not place asphalt mixture when ambient air temperature is less than that indicated in the Table nor when the surface is wet or frozen.

Lift Thickness	Min. Air Temperature, Degrees F.
1" or Less	55
1.1" to 2"	45
2.1" to 3"	40
3.1" to 4.5"	35

B. Mixture shall be delivered to the spreader at a temperature between 250 degrees F and 325 degrees F.

1.7 GUARANTEE

A. Contractor shall guarantee the quality of materials, equipment, and workmanship for a period of 12 months after acceptance. Defects discovered during this period shall be repaired by the Contractor at no cost to the Owner.

1.8 TESTING

A. Testing laboratory shall operate in accordance with ASTM D 3740 and E 329 and be acceptable to the Engineer.

B. Testing laboratory and Project Engineer/Project Representative shall be given a minimum of 48 hours notice prior to taking any tests.

C. Testing shall be Contractor's responsibility and shall be performed at Contractor's expense by a commercial testing laboratory operating in accordance with subparagraph A above.

D. Test results shall be furnished to the Engineer prior to continuing with associated or subsequent work.

PART 2 – PRODUCTS

2.1 TACK COAT

A. Shall consist of asphalt binder (asphalt cement) or emulsified asphalt, conforming to Section 401 of the South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction. Asphalt binder shall be PG64–22. The acceptable grades of emulsified asphalt are RS–1, MS–1, MS–2, HFMS–1, HFMS–2, SS–1, CRS–1, CRS–2, CMS–2, and CSS–1.

2.2 ASPHALT BINDER AND ADDITIVES

A. Shall be PG64–22 and conform to Section 401 of the South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction.

B. Anti–Stripping: Shall be hydrated lime and conform to requirements of Section 401 of the South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction.

2.3 AGGREGATES

A. General: Mineral aggregate shall be composed of fine aggregate or a combination of fine and coarse aggregate. Coarse aggregate shall be that portion of the material retained on a No. 4 sieve.

Fine aggregate shall be considered that portion passing the No. 4 sieve. Fine aggregate, coarse aggregate, and any additives in combination with the specified percentage of asphalt cement shall meet the requirements of tests specified, before acceptance may be given for their individual use. Marine (Fossiliferous) limestone shall not be used.

B. Fine Aggregate: Shall conform to the requirements of Section 401 of the South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction.

C. Coarse Aggregate: Shall be granite stone and conform to the requirements of Section 401 of the South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction.

D. Surface Course: The surface course shall consist of fine and coarse aggregate and mineral filler uniformly mixed with hot asphalt binder in an acceptable mixing plant. The plant shall conform to South Carolina Department of Transportation 2007 Standard Specifications for Highway

Construction. The gradations, asphalt content and air voids shall be the following:

TYPE C	
Square Sieve	% Passing
3/4 inch	100
1/2 inch	97 – 100
3/8 inch	83 – 100
No. 4	58 – 80
No. 8	42 – 62
No. 30	20 – 40
No. 100	8 – 20
No. 200	3 – 9
% Asphalt Binder	5.0 – 6.8
Air Voids, %	3.5 – 4.5

E. Intermediate or Binder Course: The mineral aggregates and asphalt binder shall be combined in such proportions the composition by weight of the finished mixture shall be within the following range limits:

TYPE B	
Sieve Designation	Percentage by Weight Passing
1 inch	100
3/4 inch	90 – 100
1/2 inch	75 – 90
3/8 inch	64 – 80
No. 4	38 – 54
No. 8	22 – 36
No. 30	8 – 22
No. 100	3 – 10
No. 200	2 – 8
% Asphalt Binder	4 – 6
Air Voids, %	3.5 – 4.5

2.4 SOURCE QUALITY CONTROL AND TESTS

A. Section 01400 – Quality Control and Section 01410 – Testing Laboratory Services.

B. Submit proposed mix design for review prior to beginning of work.

C. Test samples in accordance with the requirements of these specifications.

PART 3 – EXECUTION

3.1 EXAMINATION

A. On–Site Observations: Owner's Representative or Engineer will have the right to require any portion of work be completed in their presence. If work is covered up after such instruction, it shall be exposed by the Contractor for observation at no additional cost to Owner. However, if Contractor notifies Engineer such work is scheduled, and Engineer fails to appear within 48 hours, the Contractor may proceed. All work completed and materials furnished shall be subject to review by the Engineer or Project Representative. Improper work shall be reconstructed. All materials, which do not conform to requirements of specifications, shall be removed from the work upon notice being received from Engineer for rejection of such materials. Engineer shall have the right to mark rejected materials to distinguish them as such.

Contractor shall give the Owner, Project Engineer or Project Representative a minimum of 48 hours notice for all required observations or tests.

B. Contractor shall verify base has been tested, is dry, and slopes and elevations are correct.

3.2 PREPARATION

A. Apply tack coat in accordance with Section 401 of the South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction. Rate of application shall be 0.05 to 0.15 gallons per square yard of surface.

B. Work shall be planned so no more tack coat than is necessary for the day's operation is placed on the surface. All traffic not essential to the work shall be kept off the tack coat.

C. Apply tack coat to contact surfaces of curbs and gutters. Apply in manner so exposed curb or gutter surfaces are not stained.

D. Coat surfaces of manhole frames and inlet frames with oil to prevent bond with asphalt pavement. Do <u>not</u> tack coat these surfaces.

3.3 PLACEMENT

A. Construction shall be in accordance with Sections 401, 402, and 403 of the South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction.

B. Asphaltic concrete shall not be placed on a wet or frozen surface.

C. Compaction shall commence as soon as possible after the mixture has been spread to the desired thickness. Compaction shall be continuous and uniform over the entire surface. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks. Compaction rolling shall be complete before material temperature drops below 175° F.

D. Areas of pavement with deficient thickness or density shall be removed and replaced at no additional cost to the Owner.

3.4 TOLERANCES

A. General: All paving shall be subject to visual and straightedge evaluation during construction operations and thereafter prior to final acceptance. A 10–foot straightedge shall be maintained in the vicinity of the paving operation at all times for the purpose of measuring surface irregularities on all paving courses. The straightedge and labor for its use shall be provided by the Contractor. The surface of all courses shall be checked with the straightedge as necessary to detect surface irregularities. Irregularities such as rippling, tearing or pulling, which in the judgment of the Engineer indicate a continuing problem in equipment, mixture or operating technique, will not be permitted to recur. The paving operation shall be stopped until appropriate steps are taken by the Contractor to correct the problem.

B. Flatness: All irregularities in excess of 1/8 inch in 10 feet for surface courses and 1/4 inch in 10 feet for intermediate courses shall be corrected.

C. Variation from Design Elevation:

1. General Paving: Less than 1/4 inch.

2. Accessible Routes: Shall not exceed 1/4 inch. However, accessible routes shall not exceed maximum ADA allowable slopes. Contractor shall remove and replace any and all portions of the accessible route that exceed maximum ADA allowable slopes.

D. Scheduled Compacted Thickness: Within 1/4 inch per lift.

E. Pavement Deficient in Thickness: When measurement of any core indicates the pavement is deficient in thickness, additional cores will be drilled 10 feet either side of the deficient core along the centerline of the lane until the cores indicate the thickness conforms to the above specified requirements. A core indicating thickness deficiencies is considered a failed test.

Pavement deficient in thickness shall be removed and replaced with the appropriate thickness of materials. If the Contractor believes the cores and measurements taken are not sufficient to indicate fairly the actual thickness of the pavement, additional cores and measurements will be taken, provided the Contractor will bear the extra cost of drilling the cores and filling the holes in the roadway as directed.

3.5 FIELD QUALITY CONTROL

A. In–place density of the binder and surface courses shall be in accordance with the South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction, and these specifications.

B. Density Testing: Performed in accordance with ASTM D–2726 and ASTM D–2950. Core samples for each day's operation shall be taken, tested and results reported to the Engineer the following day. The areas sampled shall be properly restored by the Contractor at no additional cost to the Owner. Nuclear gauge tests shall be taken during the asphaltic concrete placement.

C. Density of each pavement course shall conform to one of the following:

1. Average 96% of laboratory density with no test less than 94%.

2. Average 92% of maximum theoretical density with no test less than 90%.

3. Average 99% of the control strip density.

D. Temperature:

1. Asphaltic concrete shall not exceed 325 degrees F at any time.

2. Asphaltic concrete shall not be placed once the temperature of the mix falls below 250 degrees F or the delivered temperature is more than 15 degrees F below the batch plant's delivery ticket.

3. Temperature at time of loading shall be recorded on the truck delivery ticket.

E. Frequency of Tests:

1. Asphaltic Concrete – One test for each 250 tons placed.

   a. Asphalt extraction and gradation test.
   b. Core Sample

2. Field determination of density by nuclear method every 5,000 square feet during construction of the asphaltic concrete binder/surface course.

END OF SECTION

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SECTION 02570 – TRAFFIC CONTROL

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SECTION 02570

TRAFFIC CONTROL

PART 1 – GENERAL

1.1 DESCRIPTION

A. This section covers furnishing, installation, and maintenance of all traffic control devices, portable signal equipment, warning signs, and temporary traffic lanes used during construction of the project.

1.2 RESPONSIBILITY

A. The Contractor shall furnish, install, and maintain all necessary automated signals, barricades, concrete traffic barriers, warning signs, traffic barriers, traffic lanes, and other protective devices. Ownership of these temporary warning devices shall remain with the Contractor provided devices are removed promptly after completion and acceptance of work to which devices pertain. If such warning devices are left in place for more than 30 days after specified time for removal, Owner shall have the right to remove such devices and to claim possession thereof.

1.3 MEASUREMENT AND PAYMENT

A. There will be no measurement for this item. Payment will be at the lump sum contract price.

PART 2 – PRODUCTS

2.1 MATERIALS

A. All barricades signs, and traffic control signal devices shall conform to requirements of the current South Carolina Manual on Uniform Traffic Control Devices except as may be modified in these project specifications.

B. Portable traffic control signal devices, barricades, signs, and other Control Devices shall be either new or in acceptable condition when first erected on Project and shall remain in acceptable condition throughout the construction period.

C. All signs shall have a black legend and border on an orange reflectorized background and will be a minimum of engineering grade reflective.

PART 3 – EXECUTION

3.1 ERECTION

A. Prior to commencement of any actual construction on the project, Contractor shall erect appropriate advance warning signs and place concrete traffic barriers where necessary. Subsequently, as construction progresses and shifts from one side of road to the other, temporary lanes must be installed to provide continuous two way traffic and bike thoroughfare.

All appropriate signs and traffic control devices pertinent to the work shall be erected ahead of construction site to advise and warn travelling public of activity and any necessary detours.

3.2 DELAYS TO TRAFFIC

A. Except in rare and unusual circumstances, two–way traffic shall be maintained at all times by temporary and/or permanent roads. There are to be no traffic delays during the hours between 7 AM – 10 AM and 4 PM – 10 PM. Between the hours of 10 AM and 4 PM the maximum delay is to be 15–minutes.

B. When traffic is halted temporarily due to transition procedures including the ingress and egress of construction vehicles, Contractor shall provide necessary flagging personnel with proper equipment and clothing to hold such traffic.

C. If Contractor's proposed traffic control plan involves more than occasional disruption to alternating one way traffic through the work, then temporary, signalized control equipment will be required.

3.3 TEMPORARY TRAFFIC LANES

A. Two–lane traffic shall be maintained at all times unless prior written permission has been given and all necessary flagging personnel and/or signage has been installed. Temporary lane line stripes shall be applied to the detour paving, as agreed to by Engineer and Owner's representative. The no–passing double center–line stripes shall be yellow. Such stripes shall be a temporary, degradable, reflectorized tape strip. All temporary striping shall be maintained throughout the period traffic control is needed.

B. Contractor is responsible for installation and removal of all temporary roads and trails throughout the construction process. These detour roads are to be in accordance with the Pavement Specifications herein.

3.4 SIGNS AND BARRICADES

A. Contractor shall provide a detailed map showing location and verbage of all traffic control signs and methods for the project. All critical warning signs for the project will be a minimum of engineering grade reflective material and include appropriate flashing lights.

B. Appropriate Safety Barricades shall be installed between bicycle trails, sidewalks, and the temporary traffic lanes. These barricades shall be impact resistant for passenger vehicles with a travelling speed of 40 mph.

1. Advance warning signs: These signs shall be placed approximately 500 feet in advance of the construction site and detour on each approach to the construction area with subsequent warning signs every 250 feet, until construction site is met.

2. Road Construction Signs: Before and during construction of the detour, advance road construction signs shall be located as already stated above. The construction site detour lanes will have reflective trestle type barricade with flashing lights spaced a maximum of 25 feet apart to delineate each side of any temporary roadway. Additional signage shall be placed to indicate a reduced speed limit of 10 mph for the entire construction area. Other signs as appropriate to a particular activity in the work area shall be erected in advance of that activity.

3. Barricades: While detour is open to traffic, a line of concrete traffic barricades shall be placed across the closed roadway to channelize traffic onto detour. They shall be spaced across the blocked roadway end to end so no vehicle will be able to pass between any two adjacent barricades.

4. Barriers: Shall be wooden having a minimum of 3 horizontal 6 inch rails spaced 20 inches on center. Markings for barrier rails shall be 6 inches wide alternate orange and white reflectorized stripes sloping downward at 45 degrees in the direction traffic is to pass.

   During hours of darkness, the Contractor shall place and maintain flashing warning lights on tops of all barriers.

5. Direction Arrow Signs: At each change in traffic direction along the detour, Contractor shall install a sign with an arrow indicating change in traffic direction. This sign is to be located across the pavement from and facing on–coming traffic.

6. End Construction Sign: This sign shall be 60 inches x 24 inches and erected approximately 200 feet beyond end of construction area on the right–hand side.

END OF SECTION

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SECTION 02575

SURFACE RESTORATION

PART 1 – GENERAL

1.1 WORK INCLUDED

A. This section covers the work necessary to replace all pavements, sidewalks, driveways, rock surfacing, drainage facilities, and other features damaged either directly or indirectly by operations incidental to new construction. The work consists of restoring existing surface areas due to planned improvements.

B. Standard specifications noted in this section are the 2007 edition of South Carolina Department of Transportation (SCDOT) Standard Specifications for Highway Construction.

C. All disturbed areas shall be left equal to or better than preconstruction conditions.

1.2 MEASUREMENT AND PAYMENT

A. No separate measurement or payment shall be made. Applicable costs shall be included elsewhere.

1.3 GENERAL PROVISIONS

A. Maintenance of Traffic

Whenever work interferes with flow of traffic along a roadway, Contractor shall provide for traffic control, signing, and public safety in accordance with provisions of the State Department of Transportation and Manual on Uniform Traffic Control Devices. Neither road closures nor detours shall be permitted unless specified in the Special Provisions and applicable permits/approvals are authorized by Engineer and DOT. Where road closures or detours are permitted by Engineer and DOT, Contractor must notify the appropriate agencies or departments prior to taking action. Proper advance notice shall be provided to the Owner, Engineer, and DOT.

Compliance with this requirement shall not be construed to relieve Contractor from the responsibility of notifying agencies or institutions whose services may be predicated upon a roadway being opened to traffic or whose services would be hindered if a roadway is closed to traffic or delays traffic. Such agencies or institutions shall include, but not be limited to, police department, fire department, municipal bus service, school bus service, and ambulance service. Contractor shall keep the required agencies informed of changing traffic patterns and detour situations.

B. Surface Restoration

Contractor shall perform all work and furnish all materials to restore the work area. This includes any gravel, asphalt, concrete, lawn, fences, mailboxes, signs or any other surfaces or related objects damaged or disturbed by the construction operation. Surface restoration shall follow as closely as possible the backfill and compaction of excavations.

Cleanup shall be a continuing process from the start of work to final acceptance of project. Contractor shall, at all times, keep the area on which work is in progress free from accumulations of waste material or rubbish.

Spillage from the Contractor's hauling vehicles on public and private roads shall be promptly cleaned up. Upon completion of work, Contractor shall remove all temporary structures, rubbish, waste material, equipment, and supplies, resulting from the Contractor's operations. Contractor shall leave such lands in a neat and orderly condition, which is at least as good as found, prior to the new work. Contractor shall submit photos and similar records of preconstruction conditions to the Engineer prior to commencing work.

In roadways and traffic areas, Contractor shall be responsible for maintaining a road surface suitable for travel by the public and emergency vehicles from time of excavation until road surface has been restored. Such work includes dust control, temporary patching, signing, grading, temporary surfaces, and filling of potholes on temporary street surfaces, etc. Contractor shall be responsible for all claims and damages resulting from failure to maintain a suitable surface.

PART 2 – PRODUCTS

2.1 BASE COURSE

A. Aggregate shall consist of processed and blended crushed stone. Aggregates shall be free from lumps and balls of clay, organic matter, objectionable coatings, and other foreign material and shall be durable and sound. Coarse aggregate shall have a percentage of wear not to exceed 65% after 500 revolutions as determined by ASTM C 131. Aggregate shall meet applicable requirements of Section 305.2 in the South Carolina Department of Transportation Standard 2007 Specifications for Highway Construction. Material shall meet the following gradation and other requirements:

Granite Stone or Recycled Concrete	
Sieve Size	Percent by Weight Passing
2"	100
1-1/2"	95 - 100
1"	70 - 100
1/2"	48 - 75
# 4	30 - 60
# 30	11 - 30
#200	0 - 12
Liquid Limit	0 to 25
Plasticity Index	0 to 6

Marine Limestone	
Sieve Size	Percent by Weight Passing
2"	100
1-1/2"	95 - 100
1"	70 - 100
1/2"	50 - 85
# 4	30 - 60
# 30	17 - 38
#200	0 - 20
Liquid Limit	0 to 25
Plasticity Index	0 to 6

B. Prime Coat: Shall be EA-P Special, Emulsified asphalt, conforming to Section 407 of the South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction.

2.2 ASPHALT CONCRETE

A. Surface Course: The surface course shall consist of fine and coarse aggregate and mineral filler uniformly mixed with hot asphalt binder in an acceptable mixing plant. The plant shall conform to South Carolina Department of Transportation 2007 Standard Specifications for Highway Construction. The gradations, asphalt content and air voids shall be the following:

TYPE C	
Square Sieve	% Passing
3/4 inch	100
1/2 inch	97 – 100
3/8 inch	83 – 100
No. 4	58 – 80
No. 8	42 – 62
No. 30	20 – 40
No. 100	8 – 20
No. 200	3 – 9
% Asphalt Binder	5.0 – 6.8
Air Voids, %	3.5 – 4.5

2.3 CONCRETE

Concrete for curbs, sidewalks, pavement, and miscellaneous construction shall conform to ASTM C 94, Alternate 3; and shall have a design mix proportioned for 3,000 pounds per square inch compressive strength at 28 days. Concrete mix shall contain no less than 5-l/2 sacks of cement per cubic yard.

1. Concrete Forms: All forms shall be either two-inch (2") dimension lumber, plywood, or metal forms.

2. Curing Compound: Commercial grade conforming to ASTM C 309, Type I.

3. Reinforcing Steel: Conform to ASTM A 615, Grade 60.

2.4 CONCRETE PIPE FOR CULVERT REPLACEMENT

Concrete Pipe shall conform to ASTM C 76, Class III O-ring unless there is less than 1.5 feet of cover over the pipe, then Class IV O-ring will be required.

PART 3 – EXECUTION

3.1 CONSTRUCTION PROCEDURE

A. Engineer reserves the right to vary classes of backfill and type of resurfacing as best serves the interest of Owner. Trench backfill shall be as specified in the details and related specifications.

B. Replace all pavement damaged under this contract with similar materials and design. Bomanite shall be replaced to match existing conditions.

3.2 REMOVAL OF PAVEMENT, SIDEWALK, CURBS AND GUTTERS

Removal and disposal of all pavement, sidewalks, curbs, and gutters shall conform to the standard specifications. Saw cut sections to be removed to create a neat edge.

3.3 STREET MAINTENANCE

Maintain all streets as specified in the applicable Encroachment Permit(s) and allow traffic to follow normal or rerouted traffic patterns.

3.4 ASPHALT CONCRETE PAVEMENT REPLACEMENT

Procedures shall be followed as specified below and as detailed on the plans.

A. Subgrade:

1. Bring trench to a smooth, even grade at correct distance below top of existing pavement surface, providing adequate space for the base course and pavement. Trim existing pavement to a straight line. Remove any pavement which has been damaged, broken, or is unsound. Provide a smooth, sound edge for joining the new pavement.

2. Compact the subgrade to ninety-seven percent (97%) of its modified proctor. (ASTM D-1557)

B. Base Course:

1. Place sufficient base course on the subgrade to obtain a minimum thickness of twelve inches (12") after compaction. Place for
2. full width of the trench and compact as required to provide a smooth surface without segregation.

2. Compact the base course with mechanical vibratory or impact tampers. Determine the amount and method of compaction necessary to prevent subsequent settlement. Any subsequent settlement of finished surfacing during the warranty period shall be promptly repaired at Contractor's expense.

C. Prime Coat: After base course has been compacted, apply an asphalt prime coat, specified above, at 0.15- to 0.30- gallon per square yard to the surface of base course and edges of existing pavement as required.

D. Asphalt Concrete:

1. Place asphalt concrete on prepared subgrade over the trench to a depth of not less than two and one-half inches (2 1/2") or depth of adjacent pavement, whichever is greater, but not for more than 6 inches. Place asphalt concrete after the prime coat has set. Spread and level asphalt concrete with hand tools or by use of a mechanical spreader, depending upon the area to be paved. Bring asphalt concrete to the proper grade and compact by rolling or use hand tampers where rolling is impossible or impractical.

2. Roll with power rollers capable of providing compression of 200 to 300 pounds per linear inch. Begin rolling from outside edge of the replacement progressing toward existing surfacing, lapping existing surface at least one-half the width of the roller. If existing surfacing bounds both edges of the replacement, begin rolling at edges of the replacement, lapping existing surface at least one-half the width of the roller, and progress toward center of the replacement area. Overlap each preceding track by at least one-half the width of the roller and make sufficient passes over entire area to remove all roller marks and to produce desired result, as determined by Engineer.

3. Finished surface of new compacted paving shall be flush with existing surface and shall conform to the grade and crown of adjacent pavement.

4. Immediately after new paving is compacted, all joints between new and original asphalt pavement shall be painted with hot asphalt or asphalt emulsion and be covered with dry paving sand before the asphalt solidifies.

E. Surface Smoothness: When a straightedge is laid across patched area between edges of old surfacing and surface of new pavement, new pavement shall not deviate from the straightedge more than one-quarter inch.

3.5 WEATHER CONDITIONS

Asphalt shall not be applied to wet material. Asphalt shall not be applied during rainfall, sand or dust storms, or any imminent storms. The Engineer will determine when surfaces and material are dry enough to proceed with construction. Asphalt concrete shall not be placed (1) when atmospheric temperature is lower than 45 degrees F (unless asphalt thickness is 1 inch, then temperature shall be above 55 degrees F), (2) during heavy rainfall,

or (3) when the surface upon which it is to be placed is frozen or wet. Asphalt mixture shall be delivered to spreader at a temperature between 275 degrees F and 325 degrees F and shall not have dropped more than 50 degrees F from temperature the mix left asphalt plant. Asphalt for prime coat shall not be applied when the surface temperature is less than 50 degrees F. Exceptions will be permitted only in special cases and only with prior written acceptance of the Engineer.

3.6 PROTECTION OF STRUCTURES

A. Provide whatever protective coverings may be necessary to protect the exposed portions of bridges, culverts, curbs, gutters, posts, guard fences, road signs, and any other structures from splashing oil and asphalt from paving operations. Remove any oil, asphalt, dirt, or other undesirable matter from structures caused by the paving operations.

B. Where water valve boxes, manholes, catch basins, or other underground utility appurtenances are within area to be surfaced, resurfacing shall be level with the top of existing finished elevation of these facilities. If it is evident these facilities are not in accordance with the proposed finished surface, notify Engineer to have proper authority contacted. Have the facility altered before proceeding with resurfacing around the obstruction. Consider any delays experienced from such obstructions as incidental to the paving operation. Protect all covers during asphalt paving.

C. All surface structures and features located outside permissible excavation limits for underground installations, together with those within the construction areas which are indicated in the Plans as being saved, shall be properly protected against damage and shall not be disturbed or removed without direction from the Engineer. Within construction limits, as required, the removal of improvements such as paving, curbing, walks, turf, etc., shall be subject to acceptable replacement after completion of underground work. All expense of removal and replacement shall be borne by the Contractor to the extent that separate compensation is not specifically provided for in the Contract.

Obstructions such as street signs, guard posts, small culverts, mailboxes, and other items of prefabricated construction may be temporarily removed during construction provided that essential service is maintained in a relocated setting as accepted by the Engineer. Nonessential items shall be properly stored for the duration of construction. Upon completion of the underground work, all such items shall be replaced in their proper setting at the sole expense of Contractor.

Contractor shall be responsible for protection of existing overhead utilities and poles. This shall include arranging with and paying the utility for holding poles close to the edge of any trench. Holding of poles and repair of any damage to these facilities shall be considered incidental to the project with no additional compensation allowed. If relocation or removal of these facilities is required, Contractor will contact the concerned utility and pay for relocation or removal at no additional expense to Owner.

3.7 EXCESS MATERIALS

Dispose of all excess materials at the Contractor's expense. Make arrangements for the disposal and bear all costs or retain any profit incidental to such disposal.

3.8 CONTRACTOR'S RESPONSIBILITY

Settlement of replaced pavement over trenches within the warranty period shall be considered result of improper or inadequate compaction of sub base or base materials. Contractor shall promptly repair all pavement deficiencies during the warranty period at Contractor's sole expense.

3.9 ROCK SURFACING

Where existing, place crushed rock surfacing material, as specified herein, for the full width of all streets, driveways, parking areas, street shoulders, and other areas disturbed by hand labor where necessary. Level and grade the rock to conform to existing grades and surfaces.

3.10 SIDEWALKS

A. Replace concrete sidewalks to the same section width, depth, line, and grade as removed or damaged.

B. Replace concrete sidewalks between scored joints and make replacement in a manner that will avoid a patched appearance. Provide a minimum two-inch (2") thick compacted leveling course of clean 3/4-inch minimum crushed rock or gravel of quality hereinbefore specified. Finish concrete surface similar to the adjacent sidewalks. Score joints and finish edges with a steel edging tool.

C. Saw cut edges neatly.

D. Tunneling under curbs and sidewalks is optional. However, should any subsequent cracking, subsidence, or any other indication of failure occur within the warranty period, damaged section shall promptly be replaced at Contractor's sole expense.

3.11 DIRECTIONAL BORING

Horizontal directional boring/drilling (HDD or Horizontal Directional Drilling) installation shall be accomplished where shown on Plans or in the Special Provisions to minimize disturbance of existing surface improvements. Contractor may elect to complete work using HDD methods if acceptable to the Engineer. The installer shall have a minimum of three years of experience in this method of construction and have installed at least 20,000 feet of 8-inch or larger diameter pipe to specified grades. Field supervisor employed by Contractor shall have at least three years of experience and shall be on site at all times during boring/drilling installation, and be responsible for all of the work.

Contractor shall submit boring/drilling pit locations to the Engineer before beginning construction.

Drilling equipment shall be capable of placing the pipe as shown on plans. The installation shall be by a steerable drilling tool capable of installing continuous runs of pipe, without intermediate pits, a minimum distance of 200 feet. The guidance system shall be capable of installing pipe within 1-1/2 inch of planned vertical dimensions and 2 inches of horizontal dimensions. Contractor shall be required to abandon pipes which vary in depth and alignment from these tolerances. Contractor shall reinstall pipes to proper depth and alignment at no additional cost to Owner.

Pull back forces shall not exceed allowable pulling forces for the pipe being installed. Drilling fluid shall be a mixture of water and bentonite clay. Disposal of excess fluid and spoils shall be the responsibility of Contractor.

3.12 CULVERTS

A. All culverts removed because of interference with new construction shall be removed with the least possible damage to pipe or basin. Dispose of culvert pipe in too poor condition for replacement because of age, physical condition, or other reasons.

B. Culverts anticipated to be removed must have elevations taken to ensure proper replacement. Replace all pipes to preexisting lines and grades. Pipe fifteen inches (15") and smaller shall be laid on a minimum four-inch (4") thick crushed stone aggregate. Use a minimum six-inch (6") thick stone aggregate base under pipe eighteen inches (18") and larger.

C. Replace culvert headwalls of all types to a condition at least equivalent to their original shape or form.

3.13 RESTORATION OF SURFACE IMPROVEMENTS

Wherever any surface improvements such as pavement, curbing, pedestrian walks, fencing, or turf have been removed, damaged or otherwise disturbed by Contractor's operations, they shall be repaired or replaced to the Engineer's satisfaction. Each item of restoration work shall be completed as soon as practicable after installation and backfilling operations on each section of pipeline.

The in place pavement structure (including base aggregates) shall be restored in kind and depth as previously existed or to the detail shown on drawings, whichever is more stringent.

Existing concrete and bituminous surfaces at the trench wall shall be sawed or cut with a cutting wheel to form a neat edge in a straight line before surfaces are to be restored. Sawing or cutting may be accomplished as a part of removal or prior to restoration at the option of Contractor. However, all surface edges will be checked prior to restoration.

3.14 TURF RESTORATION

Turf restoration shall be accomplished by sod placement except where seeding is specifically allowed or required.

Topsoil shall be placed to a minimum depth of four inches under all sod and in all areas seeded. The topsoil material used shall be light friable loam containing a liberal amount of humus and shall be free of heavy clay, coarse sand, stones, plants, roots, sticks and other foreign matter. Topsoil meeting these requirements shall be selected from excavated materials to the extent available and needed. If additional topsoil is required, Contractor shall provide it at no additional cost to the Owner.

3.15 RESTORATION OF MISCELLANEOUS ITEMS

Wherever any curbing, curb and gutter sections, pedestrian walks, fencing, driveway surfacing, or other improvements are removed or in any way damaged or undermined, they shall be restored to original condition by repair or replacement as the Engineer considers necessary. Replacement of old materials will be acceptable only to the extent existing quality can be fully achieved, such as in the case of fencing. Otherwise new materials shall be provided and placed as the Engineer directs. Workmanship and finished quality shall be equal to new construction.

A proper foundation shall be prepared before reconstructing concrete or bituminous improvements. Unless otherwise directed, granular material shall be placed to a depth of at least four inches under all concrete and bituminous items. No direct compensation will be made for furnishing and placing this material even though such course was not part of the original construction.

3.16 MAINTENANCE AND FINAL CLEANUP

All subgrade surfaces shall be maintained acceptably until the start of surfacing construction or restoration work, and until work has been finally accepted. Additional materials shall be provided and placed as needed to compensate for trench settlement and to serve as temporary construction pending completion of the final surface improvements.

Final disposal of debris, waste materials, and other remains or consequences of construction, shall be accomplished intermittently as new construction items are completed and shall not be left to await final completion of all work. Cleanup operations shall be considered as being a part of the work covered under Contract Items involved and only work which cannot be accomplished at any early time shall be considered as final cleanup work not attributable to a specific Contract Item.

If disposal operations and other cleanup work are not conducted properly as construction progresses, Engineer may withhold partial payments until such work is satisfactorily pursued or deduct the estimated cost of its performance from partial estimate value.

Maintenance of sodded and seeded areas shall include adequate watering for plant growth and replacement of any dead or damaged sod as may be required for acceptance of the work.

END OF SECTION

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SECTION 02667 – WATER DISTRIBUTION SYSTEM

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SECTION 02667

WATER DISTRIBUTION SYSTEM

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Piping.

B. Valves.

C. Fittings.

D. Connect to Existing System.

E. All necessary appurtenances to convey potable water from the existing system to the location shown on the plans.

1.2 RELATED SECTIONS

A. Section 02110 – Site Clearing.

B. Section 02204 – Earthwork.

C. Section 02902 – Grassing.

1.3 OPTIONS

A. The bid form and specifications describe several pipe materials. The Owner will select the one to be used. Where manufacturers of material or equipment are named in the specifications, the Contractor may use equipment or materials of other manufacturers provided they are reviewed and accepted by the Engineer as meeting the specifications prior to ordering such equipment or materials.

1.4 REFERENCES

A. ASTM D 3740 – Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

B. ASTM E 329 – Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

C. ANSI/AWWA C 153/A–21.53 – Ductile Iron Compact Fittings, 3 in. through 24 in. and 54 in. through 64 in., for Water Service.

D. ANSI/AWWA C 110/A21.10 – Ductile Iron and Gray Iron Fittings, 3 in. through 48 in. for Water and Other Liquids.

E. ANSI/AWWA C 150/A–21.50 – Thickness Design of Ductile Iron Pipe.

F. ANSI/AWWA C 151/A–21.51 – Ductile Iron Pipe, Centrifugally Cast, for Water or other liquids.

G. ANSI/AWWA C 104/A–21.4 – Cement–Mortar Lining for Ductile Iron Pipe and Fittings for Water.

H. ANSI A21.16 (AWWA C 116) – Protective Fusion Bonded Epoxy Coating for the Interior and Exterior Surfaces of Ductile Iron and Grey iron Fittings for Water Supply Service.

I. ASTM D 1784 – Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.

J. ASTM D 2241 – Poly (Vinyl Chloride) (PVC) Pressure–Rated Pipe (SDR – Series).

K. ANSI/AWWA C 901 – Polyethylene Pressure Pipe and Tubing, ½ in. through 3 in., for Water Service.

L. ASTM D 2737 – Polyethylene (PE) Plastic Tubing.

M. ANSI/AWWA C 115/A21.15 – Flanged Ductile Iron Pipe with Ductile Iron or Gray Iron Threaded Flanges.

N. ANSI/AWWA C 111/A21.11 – Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings.

O. ASTM D 3139 – Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.

P. ANSI/AWWA C 900 – Polyvinyl Chloride (PVC) Pressure Pipe, 4 in through 12 in., for Water Distribution.

Q. ANSI/AWWA C 500 – Metal–Seated Gate Valves for Water Supply Service.

R. ANSI/AWWA C 509 – Resilient–Seated Gate Valves for Water Supply Service.

S. ANSI/AWWA C 502 – Dry–Barrel Fire Hydrants.

T. ANSI/AWWA C 800 – Underground Service Line Valves and Fittings.

U. ANSI/AWWA C 600 – Installation of Ductile Iron Water Mains and Their Appurtenances.

V. ANSI/AWWA C 605 – Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.

W. ASTM D 2774 – Underground Installation of Thermoplastic Pressure Piping.

X. UNI–Bell UNI–B–3 – Recommended Standard for the Installation of Polyvinyl Chloride (PVC) Pressure Pipe.

Y. ASTM D 1556 – Density and Unit Weight of Soil in Place by The Sand–Cone Method.

Z. ASTM D 2922 – Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth).

AA. ANSI/AWWA C 651 – Disinfecting Water Mains.

BB. ASTM D 1557 – Laboratory Compaction Characteristics of Soil Using Modified Effort.

CC. ASTM D 2672 – Joints for IPS PVC Pipe Using Solvent Cement.

DD. ANSI B–18.2.2 – Square and Hex Bolts and Screws.

EE. ANSI B–18.2.2 – Square and Hex Nuts.

FF. NSF/ANSI 61 – Drinking Water Systems Components – Health Effects.

GG. ASSE 1003 – Performance Requirements for Water Pressure Reducing Valves for Domestic Water Distribution Systems.

HH. ASTM 6938 - In–Place Density and Water Content of Soil and Soil – Aggregate by Nuclear Methods (Shallow Depth).

1.5 QUALITY ASSURANCE

A. Materials – The Contractor will furnish the Engineer and Owner a description of all material before ordering. Contractor shall furnish Owner with a set of shop drawings in addition to the Engineer. The Engineer will review the Contractor's submittals and provide in writing an acceptance or rejection of material after receipt of comments from the Owner.

B. Manufacturer – Material and equipment shall be the standard products of a manufacturer who has manufactured them for a minimum of 2 years and who provides published data on the quality and performance of the products.

C. Subcontractor – A subcontractor for any part of the work must have experience on similar work and if required, furnish the Engineer with a list of projects and the Owners or Engineers who are familiar with his competence.

D. Design – Devices, equipment, structures, and systems not designed by the Engineer that the Contractor wishes to furnish shall be designed by either a registered professional engineer or by someone the Engineer accepts as qualified. If required, complete design calculations and assumptions shall be furnished to the Engineer or Owner before acceptance.

E. Testing Agencies – Soil testing shall be done by a testing laboratory which operates in accordance with ASTM D 3740 and E 329 latest revision and be acceptable to the Engineer prior to engagement. Mill certificates of tests on materials made by the manufacturers will be accepted provided the manufacturer maintains an adequate testing laboratory, makes regularly scheduled tests that are spot checked by an outside laboratory, and furnishes satisfactory certificates with the name of the one making the test.

F. Hydrostatic tests on pipe shall be made by the Contractor with equipment qualified by the Engineer. The Engineer or his representative reserves the right to accept or reject testing equipment. Hydrostatic testing shall be conducted in the presence of the Engineer or his representative and a representative of the Isle of Palms Water & Sewer Commission.

G. Lead Free Material – All pipe, solder and flux shall be lead free (less than 0.2 percent lead is solder and flux is less than 8.0 percent lead in pipes and fittings).

H. Contractor shall be trained and approved to perform work on asbestos cement pipe and shall comply with all applicable Federal, State, Local, EPA, OSHA regulations pertaining to exposure to and handling, containment, transport, and disposal of asbestos material.

Contractor shall have a current group license issued by SCDHEC to complete work on asbestos cement pipe. A copy of the license shall be maintained onsite. For all individuals who will be performing work on asbestos cement pipe, each individual must be certified and must carry on them a current Class III O&M Pipe card. If requested by Engineer or Owner, license(s) and card(s) must be presented immediately for inspection.

If Contractor chooses to subcontract the connection work associated with the asbestos cement pipe, the subcontractor shall be held to the same requirements and shall be available during excavation of pipe for connection and/or to remove pipe that may be in line with the new connections. For no reason shall existing pipe be exposed prior to the arrival on site.

Contractor shall provide a list to the Owner and Engineer of trained personnel who will be completing connection work on the asbestos pipe a minimum of seven days prior to completing the connections.

I. All pipe, fittings, packing, jointing materials, valves, and fire hydrants shall conform to Section C of the American Water Works Association (AWWA) Standards.

J. All materials and products that contact potable water must be third party certified as meeting the specifications of ANSI/NSF Standard 61.

1.6 REQUIREMENTS OF REGULATORY AGENCIES

A. Water mains shall be sterilized to meet the requirements of the appropriate Health Department. Sterilization shall be in accordance with AWWA Standards C–651, latest revision. Following disinfection, two (2) bacteriological samples shall be taken for each test section at least 24 hours apart and tested by a State approved laboratory. **Test results shall indicate at a minimum coliform growth, non–coliform growth (NCG) and chlorine residual at the time of sampling. Results shall properly describe the project and sample location and shall always show the date, location, time and chlorine residual.** The requirements and guidelines of the South Carolina Department of Health and Environmental Control shall be followed in all respects.

B. Fire line sprinkler systems and dedicated fire lines shall be protected by an acceptable double check valve assembly. Water lines in high hazard categories shall be protected by an acceptable Reduced Pressure Zone (RPZ) Backflow Preventer.

C. Any pipe, solder, or flux which is used in the installation or repair of any public water system or in any plumbing in a residential or nonresidential facility which provides water, through connection to a public water system, for human consumption shall be lead free. Lead free is defined as not more than 0.2% lead with respect to solder and flux and not more than 8.0% lead with respect to pipes and pipe fittings. Leaded joints necessary for repair of cast iron pipes shall be exempt from the lead-free requirement.

D. No water pipe shall pass through or come in contact with any part of a sewer manhole. Water lines may come in contact with storm sewers or catch basins if there is no practical alternative and the installation is approved by the Isle of Palms Water & Sewer Commission (IOPWSC). Ductile iron pipe must be used, and no joints of water line are within the storm sewer or catch basin, and joints are located as far as possible from storm sewer or catch basin.

E. Chambers, pits, or manholes containing valves, blow–off, meters, air release valves, or other such appurtenances to a distribution system, shall not be connected directly to any storm drain or sanitary sewer.

F. There shall be no connection between distribution system and any pipes, pumps, hydrants, or tanks whereby unsafe water or other contaminated materials may be discharged or drawn into the system.

G. Asbestos cement pipe shall not be used in potable water system except in the repair of existing asbestos cement lines.

H. Thermoplastic pipe shall not be used above grade.

I. Steel pipe shall not be allowed in water systems unless specified as in AWWA C200 or ASTM A53.

J. Water mains shall be installed out of contaminated areas, unless using piping materials protecting the system (i.e., Ductile Iron Pipe with chemical resistant Viton gaskets). Route lines out of contaminated areas if possible.

K. Cross Connection Control (Backflow Prevention Devices):

1. There shall be no connection between the distribution system and any pipes, pumps, hydrants, or tanks whereby unsafe water or other contaminated materials may be discharged or drawn into the system.

2. No–by–passes shall be allowed, unless the bypass is also equipped with an acceptable backflow prevention device.

3. Reduced pressure principal backflow prevention assemblies shall not be installed in any area location subject to possible flooding or hazardous contact. This includes pits or vaults not provided with a gravity drain to the ground's surface capable of exceeding discharge rate of relief valve. Generally, if installed in a pit, drain line shall be 2 times the size of line entering backflow prevention device. The drain cannot empty into any type of ditch, storm drain, or sewer, which could flood water back into pit.

4. All piping up to inlet of the backflow prevention device must be suitable for potable water. The pipe must be AWWA or NSF approved. Black steel pipe cannot be used on inlet side of the device.

L. Potable water lines shall not be laid less than 25 feet horizontally from any portion of a wastewater tile field or spray field or shall be otherwise protected by a method acceptable to DHEC.

M. Where the minimum cover of 30 inches cannot be provided, pipe shall be steel, concrete, ductile iron, or other material and method acceptable to DHEC, and, when necessary, insulated to prevent freezing.

1.7 PRODUCT DELIVERY, STORAGE & HANDLING

A. Material shall be unloaded in a manner avoiding damage and shall be stored where it will be protected and will not be hazardous to traffic. The Contractor shall repair any damage caused by the storage. Material shall be examined before installation and neither damaged nor deteriorated material shall be used in the work. Owner and Engineer have the right to reject defective or damaged material.

1.8 SEQUENCING AND SCHEDULING

A. The Contractor shall arrange the work so that sections of mains between valves are tested, sterilized, pavement replaced, and the section placed in service as soon as reasonable after it is placed.

1.9 ALTERNATIVES

A. The intention of these specifications is to produce the best system for the Owner. If the Contractor suggests that alternative material, equipment or procedures will improve the results at no additional cost, the Engineer and the Owner will examine the suggestion and if it is accepted, it may be used. The basis upon which acceptance of an alternative will be given is its value to the Owner, and not for the Contractor's convenience.

1.10 GUARANTEE

A. The Contractor shall guarantee the quality of the materials, equipment, and workmanship for a period of **24** months after acceptance. Defects discovered during that period shall be repaired by the Contractor at no cost to the Owner. The Performance Bond shall reflect this guarantee.

1.11 EXISTING UTILITIES

A. All known utility facilities are shown schematically on construction drawings and are not necessarily accurate in location as to plan or elevation. Utilities such as service lines or unknown facilities not shown on plans will not relieve the Contractor of his responsibility under this requirement. "Existing Utilities Facilities" means any utility that exists on the project in its original, relocated, or newly installed position. The Contractor will be held responsible for the cost of repairs to damaged underground facilities; even when such facilities are not shown on the drawings. The Contractor shall contact all utility companies prior to beginning work and request an accurate field location of their respective utility lines.

B. The Contractor shall call for underground utility locations before starting work. Underground utilities location service can be contacted at 1–888–721–7877 (SC) or 811.

1.12 CONNECT NEW MAIN TO EXISTING SYSTEM

A. The Contractor shall furnish the necessary pipe and perform all excavation, dewatering, shoring, backfilling, etc., necessary to make the connection of a new main to the existing water system. The Contractor shall contact IOPWSC a minimum of 72 hours in advance of construction. The Contractor shall be responsible for coordinating his construction with the utility operator.

1.13 DAMAGE TO EXISTING WATER SYSTEM

A. Damage to any part of the existing water system by the Contractor or Subcontractors, that is repaired by the Utility Owner's forces, shall be charged to the Contractor on the basis of time and material, plus 30% for overhead and administration.

1.14 WASTEWATER AND STORM DRAINAGE SYSTEM

A. Should work relate to the wastewater system, it shall be in accordance with current IOPWSC and SCDHEC standards. Likewise, if related to the storm drainage system, it shall be in accordance with SCDOT specifications.

1.15 MEASUREMENT AND PAYMENT

A. All work, materials, and labor shall be included in the lump sum contract price.

1.16 TESTING

A. Laboratory tests for moisture density relationship for fill materials shall be in accordance with ASTM D 1557, (Modified Proctor).

B. In place density tests in accordance with ASTM 6938.

C. Testing laboratory shall operate in accordance to ASTM D 3740 and E 329 and shall be accepted by the Engineer.

D. The testing laboratory and Project Engineer/Project Representative shall be given a minimum of 48 hours' notice prior to taking any of the tests.

E. Testing shall be the responsibility of the Contractor and shall be performed at the Contractor 's expense by a commercial testing laboratory that operates in accordance with subparagraph C above.

F. Test results shall be furnished to the Engineer.

PART 2 – PRODUCTS

Products and materials used in the work shall conform to the following:

2.1 GENERAL REQUIREMENTS

A. All material or products which come into contact with drinking water shall be third party certified as meeting the specifications of the American National Institute/National Sanitation Foundation Standard 61, Drinking Water System Components – Health Effects. The American National Standards Institute shall accredit the certifying party.

B. All pipe, fittings, packing, jointing materials, valves, valve boxes and fire hydrants shall conform to Section C of the AWWA Standards.

C. All bolts (including Stainless Steel) threads and nuts shall be treated with an approved anti-seize lubricant, Bostik Never Seez or an approved equivalent.

2.2 PIPE

A. Ductile Iron Pipe – Shall conform to AWWA C–150 (ANSI A21.5) latest revisions and AWWA C–151 (ANSI A21.51) latest revision. All ductile iron pipe shall be Class 350 unless otherwise noted and shall be cement lined in accordance with ANSI A21.4 or AWWA C–104. All ductile iron pipe shall be wrapped with polyethylene encasement.

Only products of the American Cast Iron Pipe Co., Griffin Pipe Co., and US Pipe Co. shall be used. Ductile Iron Pipe is not allowed unless noted on the plans, or in areas with less than thirty inches (30") of cover, or as required by the permitting agencies.

D. P.V.C. – All pipe shall be blue in color with factory marked homing lines. Pipe 4 inches through 36 inches shall conform to all requirements of AWWA C–900 with CI outside diameter, DR 18, pressure class of 235 p.s.i. and shall have the following minimum wall thickness:

4 inches	0.267 inches
6 inches	0.383 inches
8 inches	0.503 inches
10 inches	0.617 inches
12 inches	0.733 inches
14 inches	0.729 inches
16 inches	0.829 inches
18 inches	0.929 inches
20 inches	1.029 inches
24 inches	1.229 inches
30 inches	1.524 inches
36 inches	1.823 inches

Pipe with diameter less than four inches (4") shall conform to all requirements of ASTM D–1784 and D–2241 (SDR 21). The pipe shall have a minimum pressure rating of 200 p.s.i. Certificates of conformance with the foregoing specifications shall be furnished with each lot of pipe supplied. All PVC pipe shall bear the National Sanitation Foundation Seal of Approval.

All PVC pipe shall be stored out of sunlight or appropriately covered with a UV resistant cover. All PVC pipe shall be properly supported so sagging of the pipe does not occur during storage. Any PVC pipe showing UV degradation or sagging shall be removed and replaced at the Contractor's expense.

C. Plastic Tubing – Tubing for house service lines shall be:

Polyethylene Tubing: CTS PE 3408 conforming to all requirements of AWWA C–901 and ASTM D–2737 (SDR9). The tubing shall be copper tubing size and rated for a minimum working pressure of 200 PSI (Blue Poly). Marking on the tubing shall include nominal tubing pipe size; type of tubing material – PE 3408; SDR 9; pressure rating – 200 psi; ASTM D–2737; manufacturer's name and seal of the National Sanitation Foundation.

D. Detection tape and tracer wire shall be provided over all PVC water mains and installed as specified in these specifications.

E. Acceptance will be on the basis of the Engineer's inspection and the manufacturer's written certification that the pipe was manufactured and tested in accordance with the applicable standards, including the national Sanitation Foundation. Additionally, each piece of pipe shall be stamped "NSF Approved".

F. Fire Line Pipe – Fire Line System Supply Line requirements shall conform to Fire Protection Design and Specifications by others.

2.3 JOINTS

A. Flanged Joints – Shall conform to AWWA C–115 (ANSI A–21.15). Bolts shall conform to ASME B–18.2.1 and nuts shall conform to ASME B–18.2.2. Gaskets shall be rubber, either ring or full face, and shall be 1/8 inch thick. Gaskets shall conform to the dimensions recommended by AWWA C–115 latest revision.

B. Mechanical Joints –In ductile iron pipe shall conform to AWWA C–111 (ANSI A–21.11).

C. Push–On–Joints – In ductile iron pipes shall conform to AWWA C–111 (ANSI A–21.11).

D. Plastic Pipe – Joints in plastic pipe 4 inches through 60 inches shall meet all requirements of AWWA C–900. Joints in plastic pipe with a diameter less than 4 inches shall conform to ASTM D–3139.

E. Restrained Joints – Restrained joints for pipe, valves and fittings shall be mechanical joints with ductile iron retainer glands equivalent to "Megalug" or push–on type joints equivalent to "Lok–Ring," "TR Flex," or "Super Lock" and shall have a minimum rated working pressure of 250 psi for ductile iron pipe and 100 psi with a minimum safety factor of 2:1 for PVC pipe. The joints shall be in accordance with the applicable portions of AWWA C–111. The manufacturer of the joints shall furnish certification, witnessed by an independent laboratory, that the joints furnished have been tested without signs of leakage or failure. Restrained joints shall be capable of being deflected after assembly.

F. Natural rubber or other material which will support microbiological growth may not be used for any gaskets, o–rings, and other products used for jointing pipes, setting meters and valves or other appurtenances which will expose such material to water.

2.4 FITTINGS

A. Fittings for Ductile Iron or Plastic Pipe – Shall be ductile iron, manufactured in accordance with AWWA C–153 (ANSI A–21.53). The interior and exterior of the fitting shall be coated with fusion bonded epoxy in accordance with ANSI A21.16 (AWWA C–116). The fittings shall be cement lined in accordance with AWWA C–104 (ANSI A–21.4). The fitting shall have a minimum working pressure of 250 psi. Fittings shall be designed to accommodate the type of pipe used.

B. Fittings for Flanged Pipe – Shall be manufactured in accordance with AWWA C–110 (ANSI A–21.10), Class 125 flanges.

C. Fittings for Plastic Pipe – Less than four inches (4") shall be PVC with ring tite rubber joints conforming to ASTM D–3139 or solvent weld joints conforming to ASTM D–2672.

2.5 GATE VALVES, BUTTERFLY VALVES, AND VALVE BOXES

A. Acceptable Manufacturers: Only products of the Mueller Company and American Darling Valve Company shall be used.

B. General: Gate valves shall be standard on two–inch (2") through twelve–inch (12") installations.

C. Gate valves twelve inches (12") and smaller shall conform to the following:

1. Resilient seat type conforming to AWWA C509.

2. Epoxy coated inside and outside conforming to AWWA C550.

3. Ends shall be mechanical joint conforming to ANSI/AWWA C111/A21.11.

4. Rated for a 200-psi working pressure and be tested at 400 p.s.i.

D. Gate Valves fourteen inches (14") in diameter shall conform to the following:

1. Gate valves shall be double–disc type conforming to the requirements of AWWA C500. Valves shall be designed for 150 psi working pressure.

2. Unless shown otherwise, valves shall be designed for vertical installation.

3. Valve ends shall be mechanical joint type except where flanged or restrained joint ends are shown. Flanged joins shall meet the requirements of ANSI B16.1, Class 125.

4. Buried valves shall be equipped with valve boxes.

5. Manually operated, double disc gate valves shall be non–rising stem type having O–ring seals.

E. Tapping valves twelve inches (12") and smaller shall conform to the following:

1. Resilient seat type conforming to AWWA C509.

2. Epoxy coated inside and outside conforming to AWWA C550.

3. Ends shall be flanged by mechanical joint conforming to ANSI B 16.1, Class 125 and ANSI/AWWA C111/A21.11 respectively.

4. Rated for a 200-psi working pressure.

F. Tapping valves fourteen inches (14") and larger shall conform to the following:

1. Bronze seat, double disk type conforming to AWWA C 500.

2. Asphaltic coated inside and out conforming to AWWA C550.

3. Equipped with four–inch (4") by–pass valves.

4. Ends shall be flanged by mechanical joint conforming to ANSI B16.1, Class 125 and ANSI/AWWA C111/A21.11 respectively.

5. Allow full port opening cutters up to twenty–four inches (24").

6. Rated for a 150-psi working pressure.

G. Butterfly valves sixteen inches (16") and larger shall conform to the following:

1. Resilient seat type conforming to AWWA C504.

2. Epoxy coated inside and asphaltic coated outside conforming to AWWA C550.

3. Ends shall be flanged conforming to ANSI B16.1, Class 125.

4. Rated for a 150-psi working pressure.

H. Other requirements:

1. All valves shall have Grade B cast iron bodies conforming to ASTM A126.

2. All valves shall have a two–inch (2") square operating nut for buried service.

3. All valves shall have open left operation.

4. All valves shall be equipped with a non–rising stem.

5. All valves shall be constructed with zinc plated steel bolts and nuts.

6. Shall be in conformance with the latest revision of all referenced standards of AWWA, or ANSI shall prevail.

7. Valve boxes with drop covers will be of cast iron.

8. All valve boxes will have concrete collars as detailed on the plans except those already located in concrete.

I. Valve Box: Valve boxes shall be full cast iron with cast iron covers suitable for heavy traffic use and conform to ASTM A–48, Class 20 Specifications. Valve boxes shall be screw type and have a 5 1/4–inch inside shaft diameter. All parts shall have an asphaltic coating inside and outside with a minimum of 1 mil thickness.

Products of Tyler Pipe/Utility Division #6850 Series and Bingham and Taylor #4905 of U.S. manufacture.

J. Reduced Pressure Backflow Preventer or Double Check Valve Assembly: Any water supply project involving the use of a reduced pressure backflow preventer or double check valve assembly, will not be given final approval for operation until the backflow prevention devices have been tested by a certified tester approved by the Commission and acceptable test results provided to the Isle of Palms Water & Sewer Commission.

2.6 FIRE HYDRANTS

A. Only the following companies and products shall be used:

1. Mueller Company (Centurion).
2. US Pipe Co. (Metropolitan/M–94).

B. Fire hydrants shall be compression type, opening against pressure and closing with the pressure and conform to:

1. AWWA C502 – Dry–Barrel Fire Hydrants.

C. Coatings – All inside and outside portions of hydrant shall be coated in accordance with AWWA C–502. The exterior portion of hydrant above ground level shall be painted with two coats of best grade zinc chromate primer paint and with two coats of approved hydrant enamel. Color shall be Federal Safety Yellow unless otherwise designated by Owner.

D. Exterior coating shall be as follows:

1. Hydrant will be painted Tnemec reflective yellow paint (2 coats minimum).

2. Weather cap, operating nut, and nozzle caps will be painted with Tnemec reflective yellow paint (2 coats minimum) or a color selected by the Isle of Palms Water & Sewer Commission.

3. Hydrant parts below ground will be asphaltic coated.

4. An all bronze seat ring shall thread directly into an all bronze drain ring or heavy bronze busing located between the lower hydrant barrel and shoe securely retained in this position, or it may be threaded into a heavy bronze busing in the hydrant shoe. Drain rings cast into iron body is not acceptable.

5. All bronze or brass internal working parks in contract with service water to be low in zinc content.

E. Connections between the hydrant and the water main shall be mechanical joints with retained glands and conforming to:

ANSI/AWWA C111/A21.11	Rubber Gasket Joints for Grey–Iron and Ductile Iron Pressure Pipe and Fittings

F. Hydrants shall be wrapped in accordance with:

ANSI/AWWA C105/A21.5	Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids
Thickness:	8 Mils

G. Hydrants shall have a six inches (6") mechanical joint connection with 5 1/4" main valve.

H. Hydrant shall have two 2 1/2" hose nozzles and one 4 1/2" pumper nozzle with mechanical removal feature, set screws, lock rings, etc., and shall conform to existing national standard specifications and ANSI B26.

I. Barrel lengths shall generally be for 3 1/2' bury.

J. Hydrants shall open left or counterclockwise.

K. Hydrants shall have a 150-psi working pressure.

L. Hydrants shall be traffic designed.

M. All bolts, nuts and washers shall be stainless steel.

N. Upper assembly shall be provided with a grease or oil reservoir that automatically lubricates all operating stem threads and bearing surfaces each time of operation. The system shall be completely sealed form the waterway and external contaminants. The reservoir is to have an external filler point that does not require dismantling any portion of the hydrant during regular maintenance.

O. Casting shall indicate type, design and date of manufacturer.

P. All fire hydrants shall be tested to 300 psi test pressure before shipping.

Q. All fire hydrant leads shall include a six–inch (6") mechanical joint gate valve attached to the six–inch (6") side outlet of the mainline tee by means of an anchoring coupling with a laying length of twelve inches (12").

R. Joint Assemblies - Complete joint assemblies consisting of gland, gasket, bolts, and nut shall be furnished for mechanical joint inlets.

2.7 SERVICE CONNECTIONS

A. Taps in pipe larger than three inches (3") shall be made with a tapping machine. A corporation stop shall be installed at the connection to the main. The corporation stop shall be brass manufactured in conformance with AWWA C–800. Inlet and outlet threads shall conform to AWWA C–800.

The key and body seating surfaces shall be accurately machined and fit to a taper of 1–3/4–inches per foot. The stem and retaining nut shall be so designed that failure from over tightening of the retaining nut results in thread stripping rather than stem fracture. Only the following companies and products shall be used:

Size and Type	Ford Model No.	AY McDonald Model No.
¾" Thread by grip joint	FFB1000–3–G–NL	74701BG ¾"
1" Thread by grip joint	FFB1000–4–G–NL	74701BG 1"
1 ¼" Thread by grip joint	FFB1000–5–G–NL	74701BG 1–1/4"
1 ½" Thread by grip joint	FFB1000–6–G–NL	74701BG 1–1/2"
2" Thread by grip joint	FFB1000–7–G–NL	74701BG 2"

Service saddles shall be Romac 202S nylon coated or JCM 406 fusion plastic-coated saddles with two (2) stainless steel straps. Contractor shall adhere to pipe manufacturer's recommendations on maximum tap sizes for each main size.

B. Where connections to larger service pipes are required, multiple taps shall be made and connected by branch. Taps for house services in PVC pipe two inches (2") and smaller shall be made with a Dresser Style 294 "Qwik Tap" or a PVC Tee. The connection shall be capable of withstanding internal water pressure continuously at 150 p.s.i. House service lines will be one-inch (1") polyethylene tubing with a curb stop at the property line. The end of the service lateral at the property line shall be marked according to the details.

The depth of the pipe shall be marked on the back of the stake. Location of service line must appear on the "as–built" information and record drawings.

2.8 TAPPING SLEEVES/CROSSES

A. Shall be Mechanical Joint Type sized to fit the intercepted pipe. They shall have duck–tipped end gaskets and shall be equivalent to Mueller H–615/715 with a tapping valve attached. The outlet end of the valve shall have a joint suitable for the type of pipe to be used in the new branch. The Sleeve/Cross shall be sized to fit the intercepted pipe without leaking.

2.9 CURB STOPS

A. At the end of the service line, where the meter is to be installed, a curb stop shall be installed. The curb stop size shall be verified by the Contractor and selected from the following list:

Size and Type	Ford Model No.	AY McDonald Model No.
¾" Grip joint by meter	B43–332W–G– w/lock wing	76100MWG ¾"
1" Grip joint by meter	B43–444W–G– w/lock wing	76100MWG 1"
1 ½" Curb stop Grip by FIP	B44–666W–G– w/lock wing	76102WG 1–1/2"
1" X ¾" Grip joint by meter	B43–342W–G– w/lock wing	76100MWG 1" X 3/4"
2" Curb stop Grip by FIP	B44–777W–G– w/lock wing	76102WG 2"

2.10 BACKFLOW PREVENTER ASSEMBLY

A. Reduced Pressure – Shall consist of two independently operating check valves, one differential relief valve located between the two check valves, two resilient seat gate valves, and four properly placed resilient seated test cocks. Backflow preventer 2 inches and smaller shall have a bronze valve body. Backflow preventer greater than 2 inches shall be ductile iron or stainless steel. All internal parts in the check and relief valves shall be made of series 300 stainless steel or polymer materials suitable for potable water and rated for 175 p.s.i. working pressure. The assembly shall be constructed so all internal parts can be serviced or removed while in line. Assembly must be factory assembled and tested. Backflow preventer shall be equivalent to Febco Model LF 860 or Ames Model 4000 SS.

B. Double Check – Shall consist of two independently operating check valves, two resilient seat gate valves, and four properly placed resilient seated test cocks. Backflow preventer 2 inches and smaller shall have a bronze valve body. Backflow preventer greater than 2 inches shall be ductile iron or stainless steel. All internal parts in the check valves shall be made of Series 300 stainless steel or polymer materials suitable for potable water and rated for 175 p.s.i. working pressure. The assembly shall be constructed so all internal parts can be serviced or removed while in line. Assembly must be factory assembled and tested. Backflow preventer shall be equivalent to Febco Model 805YD or Ames Model 2000 SS.

2.11 METAL DETECTOR TAPE

A. Will be used over all pipe. The tape shall consist of 0.35 mils thick solid foil core encased in a protective plastic jacket that is resistant to alkalis, acids, and other destructive elements found in the soil. The lamination bond shall be strong enough that the layers cannot be separated by hand. Total composite thickness to be 5.0 mils. Foil core to be visible from unprinted side to ensure continuity. The tape shall have a minimum three inches (3") width and a tensile strength of 84 lbs. per three inch (3") wide strip.

A continuous warning message indicating "potable water" repeated every sixteen to thirty–six inches (16–36") shall be imprinted on the tape surface. The tape shall contain an opaque color concentrate designating the color code appropriate to the line being buried (Water Systems – Safety Precaution Blue).

2.12 TRACING WIRE

A. Tracing wire shall be #12 AWG High–Strength Copper Clad Steel (HS–CCS) Conductor, insulated with 30 mil High Density Polyethylene (HDPE) Insulation, and rated for direct burial. Insulation color shall meet APWA color code standards for identification of buried utilities. **Owner approved watertight connectors shall be used for joining the ends of tracer wires.**

2.13 BOLTS, NUTS, AND ALL–THREAD ROD

A. Bolts, nuts and all–thread rod shall be made of either high–strength cast iron containing a minimum of 0.50 percent copper, or high–strength low–carbon steel per ASTM A307, specifications for carbon steel externally threaded standard features, Grade B, having a minimum yield strength of 45,000 psi.

B. Stainless steel materials shall contain sufficient chromium to resist corrosion, oxidation, and rust.

C. Materials shall be sound, clean, and coated with a rust resistant lubricant.

D. Threads shall be in accordance with ANSI B1.1, Unified Inch Screw Threads, and with B1.2, Screw Threads, Gages, and Gaging, conforming to the coarse thread series (UNC) Unified Chords, with threads Class 2A internal and Class 2B external.

E. Bolts 3/4" and smaller shall be furnished with heavy hex heads conforming to ANSI B18.2.1.

G. Bolts larger than 3/4" may have either standard or heavy hex heads conforming to ANSI B18.2.1.

H. All bolts (including Stainless Steel) threads and nuts shall be treated with an approved anti-seize lubricant, Bostik Never Seez or an approved equivalent.

2.14 POLYETHYLENE ENCASEMENT

A. Conforms to ANSI 21.5 (AWWA C105).

B. 8 mil Polyethylene Tube.

2.15 BEDDING AND BACKFILL MATERIAL

A. Crushed stone and gravel conforming to American Society for Testing and Materials C33, Gradation 67 (3/4" to No. 4).

B. Clean, well–graded Class II and/or Class III soils. Class IV and Class V materials are not allowed. See the following table for a description of classes:

DESCRIPTION OF BEDDING AND BACKFILL MATERIAL CLASSIFICATIONS

SOIL CLASS	SOIL TYPE	DESCRIPTION OF MATERIAL CLASSIFICATION
Class I Soils*		Manufactured, angular material, 1/4 to 1 1/2 inches (6 to 40 mm) size, including materials having regional significance such as crushed stone or rock, broken coral, crushed slag, cinders, or crushed shells.
Class II Soils**	GW	Well graded gravel and gravel–sand mixtures, little or no fines. 50% or more retained on No. 4 sieve. More than 95% retained on No. 200 sieve. Clean.
	GP	Poorly graded gravel and gravel–sand mixtures, little or no fines. 50% or more retained on No. 4 sieve. More than 95% retained on No. 200 sieve. Clean.
	SW	Well–graded sands and gravelly sands, little or no fines. More than 50% passes No. 4 sieve. More than 95% retained on No. 200 sieve. Clean.
	SP	Poorly graded sands and gravelly sands, little or no fines. More than 50% passes No. 4 sieve. More than 95% retained on No. 200 Sieve. Clean.
Class III Soils ***	GM	Silty Gravel, gravel–sand–silt mixtures, 50% or more retained on No. 4 sieve. More than 50% retained on No. 200 sieve.
	GC	Clayey gravel, gravel–sand–clay mixtures. 50% or more retained on No. 4 sieve. More than 50% retained on No. 200 sieve.
	SM	Silty sands, sand–silt mixtures. More than 50% passes No. 4 sieve. More than 50% retained on No. 200 sieve.
	SC	Clayey sands, sand–clay mixtures. More than 50% passes No. 4 sieve. More than 50% retained on No. 200 sieve.

* Solids defined as Class I materials are not defined in ASTM D2487.

** In accordance with ASTM D2487, less than 5% pass No. 200 sieve.

*** In accordance with ASTM D2487, more than 12% pass No. 200 sieve. Soils with 5% to 12% pass No. 200 sieve fall in borderline classification, e.g. GP–GC.

2.16 STEEL CASING FOR HIGHWAY CROSSING

A. Casing pipe shall be steel conforming to ASTM A 139, yield point of 35,000 p.s.i., of the diameter shown on the contract drawings for each crossing. Unless otherwise specified in Section 02229 – Jack and Bore Installation of Utilities, the minimum wall thickness shall be 0.25 inches for 6 to 8-inch casing pipes, 0.375 inches for 10 to 24-inch casing pipes, and 0.500 inches for casing pipes larger than 24-inches. Only new primed and coated pipe shall be used.

B. The pipe shall have a minimum inside diameter and a minimum wall thickness as specified by the Engineer. The Engineer shall be responsible for determining if the minimum sizes and thicknesses shown on the approved drawings are adequate for placing the casing under the highway and for installing the carrier pipe.

C. Casing spacers shall be bolt on style with a shell made in two sections of a minimum 14-gauge T–304 Stainless Steel. Connecting flanges shall be ribbed for extra strength. The shell shall be lined with a PVC liner. All nuts and bolts shall be T–304 Stainless Steel. Runners shall be made of Ultra High Molecular Weight Polymer with inherently high abrasion resistance and a low coefficient of friction. The combined height of supports and runners shall keep carrier pipe a minimum of 0.75 inches from casing pipe at all times. Casing Spacers shall be as manufactured by Cascade Waterworks Manufacturing Company or accepted equivalent.

2.17 AIR RELEASE, AIR/VACUUM, AND COMBINATION AIR VALVES

A. Shall be designed for water service with a minimum working pressure of 100 p.s.i. The valve shall be constructed of a cast iron body, stainless steel or bronze trim, and stainless-steel float. The inlet shall be 2 inches, 5/16-inch orifice, and a minimum venting capacity of 35 c.f.f.a.m. It shall conform to the detail shown on the drawings. Valves shall conform to AWWA C 516 and equivalent to Crispin or Valmatic.

2.18 PRODUCT REVIEW

A. The Contractor shall provide the Engineer with a complete description of all products before ordering. The Engineer will review all products before they are ordered.

PART 3 – EXECUTION

3.1 ON–SITE OBSERVATION

A. The Engineer shall have the right to require that any portion of the work be done in his presence and if any work is covered up after such instruction, it shall be exposed by the Contractor for observation. However, if the Contractor notifies the Engineer that such work is scheduled and the Engineer fails to appear within 48 hours, the Contractor may proceed without him. All work done and materials furnished shall be subject to review by the Engineer or Project Representative. All improper work shall be reconstructed and all materials which do not conform to the requirements of the specifications shall be removed from the work upon notice being received from the Engineer for the rejection of such materials. The Engineer shall have the right to mark rejected materials so as to distinguish them as such.

The Contractor shall give the Project Engineer or Project Representative a minimum of 72 hours' notice for all required observations or tests.

It will also be required of the Contractor to keep accurate, legible records of the location of all water lines, service laterals, valves, fittings, and appurtenances. These records will be prepared in accordance with the requirements for "Record Data". Final payment to the Contractor will be withheld until all such information is received and accepted by the Isle of Palms Water & Sewer Commission.

3.2 INSTALLATION

A. Ductile iron pipe shall be laid in accordance with AWWA C–600 and all ductile iron pipe shall be wrapped with polyethylene encasement; Plastic pipe shall be laid in accordance with AWWA C 605, ASTM D 2774, UNI–Bell UNI–B 3 and the pipe manufacturer's recommendations. The standards are supplemented as follows:

1. Depth of Pipe – The Contractor shall perform excavation of whatever substances are encountered to a depth that will provide a minimum cover over the top of the pipe of thirty–six inches (36") from the existing or proposed finished grade, unless pipe material is steel, concrete, ductile iron, or other approved material, and if exposed, should be insulated to prevent freezing.

2. Alignment and Grade – The water mains shall be laid and maintained to lines and grades established by the plans and specifications, with fittings, valves, and hydrants at the required locations unless otherwise accepted by the Owner. Valve–operating stems shall be oriented in a manner to allow proper operation. Hydrants shall be installed plumb.

   a) Prior Investigation – Prior to excavation, investigation shall be made to the extent necessary to determine the location of existing underground structures and conflicts. Care shall be exercised by the contractor during excavation to avoid damage to existing structures. The pipe manufacturer's recommendations shall be used when the water main being installed is adjacent to a facility that is catholically protected.

   b) Unforeseen Obstructions – When obstructions that are not shown on the plans are encountered during the progress of work and interfere so that an alteration of the plans is required, the Owner will alter the plans, or order a deviation in line and grade, or arrange for removal, relocation, or reconstruction of the obstructions.

   c) Clearance – When crossing existing pipelines or other structures, alignment and grade shall be adjusted as necessary, with the acceptance of the owner, to provide clearance as required by federal, state, and local regulations or as deemed necessary by the Owner to prevent future damage or contamination of either structure.

3. Trench Construction – The trench shall be excavated to the alignment, depth, and width specified or shown on the plans and shall be in conformance with all federal, state, and local regulations for the protection of the workers.

4. Joint Restraint – All bends, plugs, valves, caps and tees on two–inch (2") pipe and larger, shall be provided with stainless steel tie rods or joint restraints equivalent to Megalugs. Additional restraint shall be as indicated on the drawings.

5. Anchorage for Hydrants – A concrete block 1-foot x 1-foot x 2 feet shall be poured between the back of the hydrant and undisturbed earth of the trench side without covering weep holes and bolts. Joint restraints equivalent to Megalugs manufactured by EBAA Iron may be used in lieu of concrete blocking.

6. Hydrostatic and Leakage Tests – Ductile iron pipe shall be tested in accordance with AWWA Standard C 600, Section 5.2 – Hydrostatic Testing. Allowable leakage shall not exceed the formula $L = SDP^{1/2}/148{,}000$, in which L is allowable leakage in gallons per hour; S is length of pipe in feet tested; D is nominal diameter of the pipe in inches; and P is average test pressure during leakage test in pounds per square inch gauge. Test shall be conducted for at least 2 hours and a pressure of 150 p.s.i. shall be maintained during the test. Fire lines shall be tested at 225 p.s.i. for the same duration.

   P.V.C. pipe shall be tested in accordance with AWWA Standard C 605, Section 7.3 – Hydrostatic Testing. Allowable leakage shall not exceed the formula $Q = LDP^{1/2}/148{,}000$, in which Q is allowable leakage in gallons per hour; L is length of pipe in feet tested; D is nominal diameter of the pipe in inches; and P is average test pressure during leakage test in pounds per square inch gauge. Test shall be conducted for at least 2–hours and a pressure of 150 p.s.i. shall be maintained during the test. Fire lines shall be tested at 225 p.s.i. for the same duration.

   Should any test of the pipe laid disclose leakage greater than the above specified, the Contractor shall at his own expense, locate and repair the defective joints until leakage is within the specified allowance. The Contractor is responsible for notifying the Engineer 48 hours (minimum) prior to applying pressure for testing. Pressure test will be witnessed by the Engineer or his authorized representative.

7. Bedding, Backfilling, and Compaction – Continuous and uniform bedding shall be provided for all buried pipe. All trenches and excavation shall be backfilled immediately after the pipes are laid therein, unless other protection of the pipeline is directed. The backfilling material shall be selected and deposited with special reference to the future safety of the pipes. The material shall be completely void of rocks, stones, bricks, roots, sticks, or any other debris that might cause damage to the pipe and tubing or that might prevent proper compaction of the backfill. Except where special methods of bedding and tamping are provided for, clean earth or sand shall be solidly tamped about the pipe up to a level at least two feet (2') above the top of the pipes, and shall be carefully deposited to uniform layers, each layer solidly tamped or rammed with proper tools so as not to injure or disturb the pipeline. The remainder of the backfilling of the trench shall be carried on simultaneously on both sides of the pipe in such manner that injurious side pressure does not occur. The material used shall be selected from excavated material anywhere on the work if any of the material is suitable. Stones, other than crushed bedding, shall not come in contact with the pipe and shall not be within six inches (6") of the pipe.

Under traffic areas, the top twenty–four inches (24") of backfill material shall be compacted to a density of not less than ninety–eight percent (98%) of maximum laboratory density at optimum moisture as determined by ASTM D 1556 or D 2922. Below the twenty–four–inch 24" line to, and including the area around the pipe, the density shall not be less than ninety five percent (95%) of maximum laboratory density, at optimum moisture. In areas other than traffic areas, the backfill shall be compacted to ninety five percent (95%) of maximum laboratory density at optimum moisture. In areas other than traffic areas, the backfill shall be compacted to 90% of maximum laboratory density at optimum moisture.

Whenever the trenches have not been properly filled, or if settlement occurs, they shall be refilled, smoothed off and finally made to conform to the surface of the ground. Backfilling shall be carefully performed, and the original surface restored to the full satisfaction of the Engineer immediately after installation.

Where thermoplastic (PVC) pipe is installed, the Contractor shall take precautions, in accordance with ASTM D–2774, during the backfill operations so as not to create excessive side pressures, or horizontal or vertical deflection of the pipe, nor impair flow capacity.

8. New Service Connections – The Contractor shall tap the main and install a service connection to each lot or as directed by the Engineer in accordance with the detail shown on the plans. Plastic tubing for service lines shall be installed in a manner that will prevent abrupt changes or bends in any direction. The Contractor shall exercise extreme caution to prevent crimping of the tubing during handling, storage and installation. The tubing shall have an absolute positive connection to the water main to prevent leakage. Taps shall be made perpendicular to the main. A water service connection shall be marked on the curb with a "W." The mark shall be made with a branding iron on the vertical face of the curb and shall be a minimum of ¼–inch in depth.

9. Detection Tape – Detection tape will be used over all pipe and tubing. The tape shall be laid eighteen inches (18") below finished grade.

10. Tracing Wire – Tracing wire will be installed on all water mains and water service laterals directly on top of the water line. The wire shall be secured to the pipe with tape or other acceptable methods at a spacing of no more than thirty–six inches (36") apart. Where water service laterals connect to water mains, the wire insulation shall be stripped so the bare wires can and shall be joined securely together. An approved water–tight connector device shall be used to join the wires together. The insulated wire must maintain electrical continuity. The tracing wire shall also be stubbed up into each valve box and at each fire hydrant. Stub up connections shall be stripped and joined as previously described for water service laterals. This tracing wire system shall be checked and tested by the contractor, in the presence of the Engineer or water department, prior to acceptance of the water main installation. All equipment, meters, detectors, etc., needed for testing shall be furnished by the Contractor.

11. Lubricants – Lubricate pipe before jointing per manufacturer's recommendations using approved lubricants. Lubricants which will support microbiological growth shall not be used. Vegetable shortening shall not be used to lubricate joints.

12. Hydrant drains shall not be connected to or located within ten feet (10') of sanitary sewers. No flushing device shall be directly connected to any sewer.

13. Jacking and Boring - Steel casing of diameter shown on the plans shall be jacked and bored in location indicated. Joints between sections of the steel casing shall be of a continuous weld made by a certified welder. Jacking and boring shall be in accordance with the South Carolina Department of Transportation Standard Specifications, Railroad Specifications for Pipeline Occupancy for rail crossings. Carrier pipe shall be installed as shown on the detail. After carrier pipe has been installed, ends of the casing shall be sealed using a rubber enclosure and stainless-steel straps or brick and mortar.

    Where work involves a highway, Resident Engineer of the State Department of Transportation shall be notified 3 days before crossing is started. Where the work involves a railroad, installation shall conform to requirements of AREA specifications. Division Superintendent of the Railroad shall be notified three 3 days prior to beginning work. Before commencing work within right–of–way of railroads or highways, Contractor shall verify the Owner has obtained required permits.

3.3 AIR RELEASE, AIR/VACUUM, AND COMBINATION AIR VALVES

A. Valves shall be installed in locations as shown on the contract drawings. The Contractor shall verify high points in the water line and notify Engineer of differing conditions from the drawings.

B. Valves shall be opened during initial filling of the water main. Valves shall be closed during hydrostatic testing. Once tested and the system is accepted for operation, valves shall be opened when water lines are put online.

3.4 CONNECTIONS OF WATER MAINS

A. Any physical connection of untested water mains with existing water mains is prohibited except when acceptable backflow prevention devices have been installed and checked by Engineer or Engineer Representative

1. Any new water main to be tested must be capped and restrained with retaining glands or thrust blocks to prevent blow out or leakage during the pressure testing.

2. Water for filling or flushing the new water main will be obtained through a Temporary Jumper Connection to the existing main. Appropriate taps of sufficient size must be made at the end of the new system to allow air to escape during the filling sequence.

3. This physical tie–in with the existing system must be physically disconnected after sufficient water for hydrostatic testing and disinfection has been obtained.

4. Once the new water system has demonstrated adequate hydrostatic testing and has been chlorinated in accordance with paragraph 3.5, the new system must be flushed using the filling method described therein. The system or main will then be subjected to bacteriological testing.

5. The permanent connection to the new system must be made with clean materials. The connection may be made with either solid or split ductile iron sleeves. Any connection with stainless steel or similar metal full circle clamps is prohibited. Once the connection has been made, the new system must be flushed using water from the existing system to insure adequate flow and velocity into the new water system.

6. Connections to existing water mains comprised of asbestos cement shall be completed by personnel properly trained in handling asbestos cement pipe. Refer to paragraph 1.5, part H for requirements associated with documentation.

   Contractor shall provide a list to the Owner and Engineer of trained personnel who will be completing the connection work on the asbestos pipe a minimum of seven days prior to completing the connections.

3.5 DISINFECTION

A. Prior to commencement of water line disinfection activities, the water lines shall be pigged a minimum of three times with a water line pig having a diameter one inch (1") larger than the diameter of the pipe in order to remove any debris within the lines. Upon completion of the final pass of the water line pig through the line(s), a swabbing pig shall be passed through the line(s). The swabbing pig shall have a diameter 1" larger than the water main. **Contractor shall have a minimum of one new water line pig and one new swabbing pig available on site per pig assembly prior to commencement of the pigging activities.** The water line pig shall be a Pipeline Pigging Products Inc. (PPP) model or approved equivalent. The swabbing pig shall be a PPP model or approved equivalent. If the Contractor requests to pig the water line more than the minimum stated above, the Contractor shall pay for water associated with the additional pigging activity. The basis for the cost of water is provided below.

   Water pipes shall be disinfected in accordance with AWWA C 651 and the Regulations of the local Health Department.

   All new mains and repaired portions of, or existing mains shall be thoroughly flushed then chlorinated with not less than fifty parts per million (50 ppm) of available chlorine. Chlorine gas or seventy percent high–test calcium hypochlorite can be used. Water from the existing distribution system or other source of supply should be controlled so as to flow slowly into the newly laid pipeline during the application of chlorine. The solution shall be retained in the pipeline for not less than twenty–four (24) hours and a chlorine residual of twenty–five parts per million (25 ppm) shall be available at this time. Then the system shall be flushed with potable water and the sampling program started. The chlorine residual during sampling shall be between 0.5 and 1.5 ppm.

Prior to sampling, the chlorine residual must be reduced to normal system residual levels or be non detectable in those systems not chlorinating. Normal system residual should be between 0.2 and 0.8 PPM. The chlorine residual shall be measured and reported. If the membrane filter method of analysis is used for the coliform analysis, non–coliform growth must also be reported. If the non–coliform growth is greater than eighty (80) colonies per one hundred (100) milliliters, the sample result is invalid and must be repeated. All samples shall be tested for bacteriological (chemical and physical) quality in accordance with standard methods for examination of water and wastewater; and shall show the absence of coliform organisms. The results, clearly showing sample locations, non–coliform growth, coliform growth, and chlorine residuals, shall be submitted to Engineer by Contractor.

A minimum of two (2) samples from each sampling site shall be collected for total coliform analysis. The number of sites depends on the amount of new construction but must include all dead-end lines, be representative of the water in the newly constructed mains and shall be collected a minimum of every 1,000 linear feet. Each set of samples shall be taken at least 24 hours apart after disinfection and tested by a State approved lab and shall indicate bacteriological satisfactory water. The Contractor shall submit the results to the Engineer.

Contractor shall use an Owner approved laboratory for sample analysis.

All sampling shall occur between Monday thru Thursday. Contractor shall notify Owner and Engineer a minimum of 72 hours in advance of sampling activities.

Contractor shall limit the amount of water used for sampling. ***Flushing of sample points shall be completed during normal business hours. Sample points shall not be flowed overnight or over weekends unless approved and coordinated in advance with the Owner.*** *If any test fails twice, Contractor shall pay for water used during subsequent testing. The cost for the water used in subsequent flushing shall be calculated based on a rate of $3 per 1,000 gallons used. One flushing volume is equal to the volume of the total length of new water main.*

3.6 ACCEPTANCE OF PORTIONS OF THE WORK

A. The Owner reserves the right to accept and use any portion of the work whenever it is considered to his interest to do so. The Engineer shall have power to direct on what line the Contractor shall work and the order thereof.

3.7 GRASSING

A. Grassing of areas disturbed during construction shall be in accordance with the standard SCDOT specifications and as noted in the Section 02902 "Grassing."

3.8 SEPARATION BETWEEN WATER AND SANITARY SEWER

A. Parallel Installation:

1. Water mains shall be laid at least ten feet (10') horizontally from any existing or proposed sanitary sewer, storm sewer, or sewer manhole. The distance shall be measured edge–to–edge.

2. When local conditions prevent a horizontal separation of ten feet (10'), the water main may be laid closer to a sewer (on a case–by–case basis) provided the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation that the bottom of the water main is at least eighteen inches (18") above the top of the sewer. It is advised that the sewer be constructed of materials and with joints that are equivalent to water main standards of construction and be pressure tested to assure water–tightness prior to backfilling.

3. Both water and sanitary sewer or force mail lines must be Ductile Iron when laid in violation of separation requirements.

B. Crossing:

1. Water mains crossing house sewers, storm sewers, or sanitary sewers shall be laid to provide a separation of at least eighteen inches (18") between the bottom of the water main and the top of the sewer. At the crossings, one full length of water pipe shall be so located that both joints will be as far from the sewer as possible. Special structural support for the water and sewer pipes may be required.

2. When local conditions prevent a vertical separation of eighteen inches (18"), the sewer passing over or under water mains shall be constructed of materials and with joints that are equivalent to water main standards of construction and shall be pressure tested to assure water–tightness prior to backfilling.

3. When water mains cross under sewers, additional measures shall be taken by providing:

   a. a vertical separation of at least eighteen inches (18") between the bottom of the sewer and the top of the water main.

   b. adequate structural support for the sewers to prevent excessive deflection of joints and settling on and breaking the water mains.

   c. that the length of water pipe be centered at the point of crossing so that the joints will be equidistant and as far as possible from the sewer; and

   d. both the sewer and the water main must be ductile iron.

   e. Both the sewer and water main shall be constructed of water pipe and subjected to hydrostatic tests, as prescribed in this document. Encasement of the water pipe in concrete shall also be considered.

4. When it is impossible to obtain distances specified in Section R.61-58.4(D)(12)(a) and (b) of the State Primary Drinking Water Regulations, an alternate, SCDHEC accepted design may be allowed. The alternate must:

   a. Maximize distances between the water main and sewer line and joints of each.

b. Use materials that meet requirements cited in Section R.61-58.4(D)(1) of the State Primary Drinking Water Regulations for sewer line; and

c. Allow enough distance to make repairs to one of the lines without damaging other.

d. Alternate must be approved by Isle of Palms Water & Sewer Commission.

3.9 REMOVE AND REPLACE PAVEMENT

A. Pavement shall only be removed after prior written authorization by the Owner. Pavement removed and replaced shall be constructed in accordance with the latest specifications of the State Department of Transportation. Traffic shall be maintained and controlled by means of flagmen and controlled per State Department of Transportation regulations.

The edges of the pavement shall be cut to a neat straight line with a masonry saw. The backfill shall be compacted and tested per requirements identified below. A temporary wearing surface shall be installed until final wearing surface can be installed. The final wearing surface shall be as shown in the details and at least 2 inches thick. Work shall be completed per SCDOT requirements.

3.10 FIELD QUALITY CONTROL

A. Soil and density tests shall be made by a testing laboratory approved by the Engineer and shall be made at the Contractor's expense. Laboratory tests of the soil shall be made in accordance with ASTM D 1557. In–place density tests shall be made in accordance with ASTM D 6938. Results of the tests shall be furnished to the Engineer.

The minimum number of tests required shall be:

Backfill over pipe
in traffic areas.. . . . . 1 per 100 lf or less (minimum of 1 per each driveway and road crossing) for each 2 feet of depth or portion thereof.

1 per 100 lf or less for all longitudinal road cuts (2 feet depth or portion thereof).

Backfill over pipe
in non–traffic areas. . . . .1 per 300 lf or less for each 4 feet of depth or portion thereof.

The minimum percent of compaction of the backfill material (in accordance to ASTM D 1557) shall be the following:

In traffic Areas. . . . . .98% of maximum laboratory density (modified proctor).

In non–traffic Areas . . . . . 90% of maximum laboratory density (modified proctor).

END OF SECTION

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SECTION 02720

STORM DRAINAGE

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Construction of pipes, drainage inlets, manholes, headwalls, and various drainage structures.

1.2 RELATED SECTIONS

A. Section 02731 – Wastewater Collection System

B. Section 03305 – Site Concrete

1.3 OPTIONS

A. The bid form and specifications describe several pipe materials. Where manufacturers of material or equipment are named in the specifications, Contractor may use equipment or materials of other manufacturers provided they are reviewed and accepted by Engineer as equivalent to those specified.

1.4 REFERENCES (Latest Revision)

A. ASTM B 745/B 745M – Corrugated Aluminum Pipe for Sewers and Drains.

B. ASTM C 55 – Concrete Building Brick.

C. ASTM C 62 – Building Brick (Solid Masonry Units Made From Clay or Shale).

D. ASTM C 76 – Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.

E. ASTM C 144 – Aggregate for Masonry Mortar.

F. ASTM C 150 – Portland Cement.

G. ASTM C 207 – Hydrated Lime for Masonry Purposes.

H. ASTM C 443 – Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.

I. ASTM C 478 – Precast Reinforced Concrete Manhole Sections.

J. ASTM C 913 – Precast Concrete Water and Wastewater Structures.

K. ASTM C 1433 – Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers.

L. ASTM D 1056 – Flexible Cellular Materials – Sponge or Expanded Rubber.

M. ASTM D 1557 – Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.

N. ASTM D 1751 – Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non–extruding and Resilient Bituminous Types).

O. ASTM D 1752 – Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

P. ASTM D 2321 – Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications.

Q. ASTM D 3212 – Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.

R. ASTM D 3740 – Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

S. ASTM D 6938 – In Place Density and Water Content of Soil and Soil–Aggregate by Nuclear Methods (Shallow Depth).

T. ASTM E 329 – Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

U. ASTM F 405 – Corrugated Polyethylene (PE) Pipe and Fittings.

V. ASTM F 477 – Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

W. ASTM F667 – 3 through 24 in. Corrugated Polyethylene Pipe and Fittings.

X. ASTM F 2306/F 2306M – 12 to 60–Inch (300 to 1,500 mm) Annular Corrugated Profile–Wall Polyethylene (PE) Pipe and Fittings for Gravity–Flow Storm Sewer and Subsurface Drainage Applications.

Y. AASHTO M 294 – Corrugated Polyethylene Pipe, 300 to 1500–mm (12 – to 60–in.) Diameter.

1.5 QUALITY ASSURANCE

A. Material Review – Contractor will furnish the Engineer and Owner a description of all material before ordering. Engineer will review the Contractor's submittals and provide in writing an acceptance or rejection of material.

B. Manufacturer – Material and equipment shall be standard products of a manufacturer who has manufactured them for a minimum of 2 years and provides published data on their quality and performance.

C. Subcontractor – A subcontractor for any part of the work must have experience on similar work, and if required, furnish Engineer with a list of projects and Owners or Engineers who are familiar with their competence.

D. Design – Devices, equipment, structures, and systems not designed by Engineer and Contractor wishes to furnish, shall be designed either by a Registered Professional Engineer or by someone the Engineer accepts as qualified. If required, complete design calculations and assumptions shall be furnished to the Engineer or Owner before ordering.

E. Testing Agencies – Soil tests shall be taken by a testing laboratory operating in accordance to ASTM D–3740 and E–329 and be acceptable to the Engineer prior to engagement. Mill certificates of tests on materials made by manufacturers will be accepted provided the manufacturer maintains an adequate testing laboratory, makes regularly scheduled tests, spot checked by an outside laboratory and furnishes satisfactory certificates.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Material shall be unloaded in a manner avoiding damage and shall be stored where it will be protected and will not be hazardous to traffic. Contractor shall repair any damage caused by the storage. Material shall be examined before installation. Neither damaged nor deteriorated material shall be used in the work.

1.7 SEQUENCING AND SCHEDULING

A. Contractor shall arrange work so sections of pipes between structures are backfilled, checked, pavement replaced, and the section placed in service as soon as reasonable after installation.

1.8 ALTERNATIVES

A. The intention of these specifications is to produce the best system for the Owner. If Contractor suggests alternate material, equipment or procedures will improve results at no additional cost, the Engineer and Owner will examine suggestion, and if accepted, it may be used. The basis upon which acceptance of an alternate will be given is its value to Owner and not for Contractor's convenience.

1.9 GUARANTEE

A. Contractor shall guarantee quality of materials, equipment, and workmanship for a minimum period of 12 months or as required by the local governing agency after acceptance. Defects discovered during this period shall be repaired by Contractor at no cost to the Owner.

1.10 EXISTING UTILITIES

A. All known utility facilities are shown schematically on the construction drawings, and are not necessarily accurate in location as to plan or elevation. Utilities such as service lines or unknown facilities not shown will not relieve the Contractor of responsibility under this requirement. "Existing Utilities Facilities" means any utility existing on the project in its original, relocated, or newly installed position. Contractor will be held responsible for cost of repairs to damaged underground facilities, even when such facilities are not shown on the drawings.

B. The Contractor shall call for underground utility locations before starting work. Underground utilities location service can be contacted at 1–888–721–7877 (SC) or 811.

1.11 MEASUREMENT AND PAYMENT

A. Pipe Culverts and Storm Drains – Length of pipe will be paid for on a linear foot basis, as measured along the centerline, from end of pipe to end of pipe, end of pipe to center of structure or center of structure to center of structure. Payment of which will constitute full payment for all pipe, joints, filter fabric and bedding, including trenching, dewatering, excavation, backfill and compaction, surface clean–up, and all incidental labor and material necessary to complete the construction of pipe as required by this section of specifications.

B. Drainage Structures – Payment will be made on a contract unit price basis. Payment will constitute full payment for all dewatering, excavation, formwork, precast concrete, backfill, compaction, frames, gratings or covers, concrete, brick and all miscellaneous materials, surface clean–up and labor necessary to complete the construction.

C. Omitted.

D. Sheeting and Bracing – Will not be measured for direct payment. All costs and charges in connection therewith shall be reflected and included in the item of work to which it pertains.

E. Omitted.

F. Omitted.

G. Omitted.

H. Omitted.

I. Omitted.

J. Connect Pipe to Existing Structures – Separate payment will not be made for each pipe size connected. Work associated with precast structures including dewatering, excavation, coring, installing, and grouting in pipe, backfilling, compaction and all work necessary to complete the connection shall be considered inclusive of the drainage pipe line items. Work associated with brick structures including dewatering, excavation, cutting a hole, installing and grouting in pipe, backfilling, compaction and all work necessary to complete the connection shall be considered inclusive of the drainage pipe line items. No separate payment will be made for these items.

K. Pipe Video – Payment will be made at the contract unit price per linear foot. Payment will include all equipment, labor, and materials necessary to televise and video record 100% of pipes. Contractor shall provide Engineer with one copy of the video recording.

1.12 TESTING

A. Laboratory tests for moisture density relationship for fill materials shall be in accordance with ASTM D 1557, (Modified Proctor).

B. In place density tests in accordance with ASTM D 1556 or ASTM D 6938.

C. Testing laboratory shall operate in accordance with ASTM D 3740 and E 329 and be acceptable to the Engineer.

D. Testing laboratory and Project Engineer/Project Representative shall be given a minimum of 48–hours' notice prior to taking any tests.

E. Testing shall be the Contractor's responsibility and shall be performed at Contractor's expense by a commercial testing laboratory operating in accordance with subparagraph C above.

F. Test results shall be furnished to the Engineer prior to continuing with associated or subsequent work.

PART 2 – PRODUCTS

2.1 PIPE

A. Concrete Pipe – Shall be reinforced Class III, Class IV, or Class V and shall conform to ASTM Specification C–76. Pipe shall be manufactured without lifting holes. Gasketed single offset joints may be used in lieu of 'O' ring joints if acceptable to the Engineer.

Joint design shall be bell and spigot or tongue and groove. Joints shall be water tight using a confined gasket joint consisting of an O–ring rubber gasket conforming to requirements of ASTM C 443. Joint assemblies shall be accurately formed so when each pipe section is forced together, the assembled pipe shall form a continuous watertight conduit with smooth and uniform interior surface. Gaskets shall be the sole element of providing joint water tightness.
Ends of pipe shall be in planes at right angles to the longitudinal centerline of pipe. Ends shall be finished to regular smooth surfaces.

B. Corrugated Aluminum Alloy Pipe – Shall conform to ASTM B745. Pipe may be annular or helical.

1. Joints – Coupling bands shall be one piece lap–type, having a width conforming to the pipe manufacturer's recommendations. They shall be of the angle lug, rod and lug, or U–bolt type. The type, size, and gauge of bands and size of angles, bolts, and rods shall be as specified in applicable standards or specifications for pipe. Exterior rivet heads in the longitudinal seam under coupling band shall be countersunk or rivets shall be omitted and the seam welded.

2. Gaskets – Gaskets shall be made of 3/8 inch thick by 6–1/2 inch minimum width closed cell expanded synthetic rubber, fabricated in the form of a cylinder with a diameter approximately 10% less than nominal pipe size.

The gasket material shall conform to requirements of ASTM D1056, Grade Number SBE–43.

3. Bends – Where specified, shall be shop fabricated to angles and dimensions shown on the construction drawings.

C. Polyethylene – Shall be high density polyethylene corrugated pipe having an integrally formed smooth interior, equivalent to Advanced Drainage Systems N–12WT, N–12STIB or Hancor Blue Seal or Sure–Lok ST. Pipe shall conform to ASTM F667 and F2306.

1. Joints – Pipe shall be joined using an integral bell and spigot joint meeting ASTM F2306 specifications. The joint shall be soil and water tight and gaskets, when applicable, shall meet requirements of ASTM F477. A joint lubricant supplied by manufacturer shall be used on the gasket and bell during assembly.

D. Subgrade Drain – Shall be heavy duty corrugated polyethylene perforated pipe manufactured by Advanced Drainage Systems (ADS) or equivalent and shall conform to ASTM F–405.

E. Roof Drain – Shall be SDR 26 PVC Pipe. Pipe shall be green or white in color.

2.2 DRAINAGE STRUCTURES

A. Details – See plans.

B. Concrete – Reinforced and non–reinforced.

1. Minimum compressive strength = 3,000 p.s.i. at 28 days.

2. Reinforcing shall be covered by a minimum 1–inch of concrete for top slabs and 1–1/2 inches for walls and bases and 3 inches where concrete is deposited directly against the ground.

3. Expansion joint filler materials shall conform to ASTM D 1751 or D 1752.

C. Mortar – Connection of pipe and drainage structures shall be composed of one part by volume of Portland cement and two parts of sand. The Portland cement shall conform to ASTM C–150, Type I or II. The sand shall conform to ASTM C–144 and shall be of an accepted gradation. Hydrated lime may be added to the mixture of sand and cement in an amount equal to 25% of cement volume used. Hydrated lime shall conform to ASTM C–207, Type S. Quantity of water in the mixture shall be sufficient to produce a workable mortar, but shall in no case exceed 7 gallons of water per sack of cement. Water shall be clean and free of harmful acids, alkalies, and organic impurities. The mortar shall be used within 30 minutes from time ingredients are mixed with water.

D. Brick Masonry – Brick shall conform to ASTM Specification C–62, Grade SW or C–55, Grade S. Mortar for jointing and plastering shall consist of one part Portland cement and two parts fine sand. Lime may be added to the mortar in an amount not more than 25% of the cement volume used. Joints shall be

completely filled and shall be smooth and free from surplus mortar on the inside of structure. Brick structures shall be plastered with 1/2 inch of mortar over entire outside surface of the walls. For square or rectangular structures, brick shall be laid in stretcher courses with a header course every sixth course, and for round structures, brick shall be laid radially with every sixth course a stretcher course.

E. Precast – Shall be constructed in accordance with ASTM C–478, C–913, or C–1433 and conform to details on the project drawings.

1. Joints – Shall be tongue and groove sealed with flexible gaskets or mastic sealant. Gaskets shall be O–Ring or Type A or B "Tylox" conforming to ASTM C443 and mastic shall be "Ram–nek" or equivalent with primer. Primer shall be applied to all contact surfaces of manhole joints at the factory in accordance with manufacturer's instructions.

2. Steps – Shall be polypropylene equivalent to M.A. Industries, Type PS–1 or PS–1–PF. Steps shall be installed at the manhole factory and in accordance with recommendations of step manufacturer. Manholes will not be acceptable if steps are not installed accordingly.

3. Leaks – No leaks in the manhole will be acceptable. All repairs made from inside the manhole shall be made with mortar composed of one part portland cement and two parts clean sand; mixing liquid shall be straight bonding agent equivalent to "Acryl 60."

F. Frame, cover & grating shall conform to details shown on the project drawings. Grates in pavement and in other flush–mounted type surfaces shall be of a "bicycle–safe" configuration consisting of 45–degree diagonal bars or slotted grates with a maximum clear opening of 1 inch and a maximum length of 9–inches. In any case, the long dimension of openings should be located transverse to direction of traffic when possible.

2.3 FILTER FABRIC

A. Shall be a non–woven heat–bonded fiber of polypropylene and nylon filaments equivalent to Mirafi 140 N. The fabric shall be finished so filaments will retain their relative position with respect to each other. Fabric shall contain stabilizers and/or inhibitors added to the base plastic to make filaments resistant to deterioration due to ultraviolet and/or heat exposure. The product shall be free of flaws, rips, holes, or defects.

2.4 SOILS AND STONE AGGREGATES

A. Stone aggregate shall be clean crushed granite or concrete meeting the gradation requirements of grade No. 57.

B. Soils used for bedding, haunching, and initial backfill shall be as shown in the following table and shall meet requirements and classifications of ASTM D2321 and ASTM D2487.

Class	Type	Soil Group Symbol D 2487	Description	Percentage Passing Sieve Sizes		
				1–1/2 inch (40 mm)	No. 4 (4.75 mm)	No. 200 (0.075 mm)
IB	Manufactured, Processed Aggregates; dense–graded, clean.	None	Angular, crushed stone (or other Class 1A materials) and stone/sand mixtures with gradations selected to minimize migration of adjacent soils; contain little or no fines.	100%	≤50%	<5%
II	Coarse – Grained Soils, clean	GW	Well–graded gravels and gravel–sand mixtures; little or no fines.	100%	<50% of "Coarse Fraction"	<5%
		GP	Poorly–graded gravels and gravel–sand mixtures; little or no fines.			
		SW	Well–graded sands and gravelly sands; little or no fines.		>50% of "Coarse Fraction"	
		SP	Poorly–graded sands and gravelly sands; little or no fines.			
	Coarse–Grained Soils; borderline clean to w/fines.	Eg. GW–GC, SP–SM.	Sands and gravels that are borderline between clean and with fines.	100%	Varies	5% to 12%
III	Coarse–Grained Soils with Fines	GM	Silty gravels, gravel–sand–silt mixtures.	100%	<50% of "Coarse Fraction"	5%
		GC	Clayey gravels, gravel–sand–clay mixtures.			
		SM	Silty sands, sand–silt mixtures.		>50% of "Coarse Fraction"	
		SC	Clayey sands, sand–clay mixtures.			
IVA	Fine–grained soils (inorganic)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, silts with slight plasticity.	100%	100%	>50%
		CL	Inorganic clays of low to medium plasticity, gravely clays, sandy clays, silty clays, lean clays.			

2.5 PRODUCT REVIEW

A. Contractor shall provide the Engineer with a complete description of all products before ordering. Engineer will review all products by the submittal of shop drawings before they are ordered.

PART 3 – EXECUTION

3.1 ON SITE OBSERVATIONS OF WORK

A. The line, grade, deflection, and infiltration of storm sewers shall be tested by Contractor under direction of Engineer. Owner's Representative or Engineer will have the right to require any portion of work be completed in their presence and if work is covered up after such instruction, it shall be exposed by Contractor for observation. However, if Contractor notifies Engineer such work is scheduled and the Engineer fails to appear within 48–hours, Contractor may proceed. All work completed and material furnished shall be subject to review by the Engineer or Project Representative. All improper work shall be reconstructed. All materials not conforming to requirements of specifications shall be removed from the work upon notice being received from Engineer for rejection of such materials. Engineer shall have the right to mark rejected materials to distinguish them as such.

Contractor shall give the Project Engineer or Project Representative a minimum of 48–hours' notice for all required observations or tests. Storm sewers shall be dry for observation by the Engineer. Lines under water shall be pumped out by Contractor prior to observation, at no additional cost to the Owner.

It will also be required of Contractor to keep accurate, legible records of the location of all storm sewer lines and appurtenances. These records will be prepared in accordance with paragraph on "Record Data and Drawings" in the Special Conditions. Final payment to the Contractor will be withheld until all such information is received and accepted.

3.2 EXCAVATION FOR PIPE AND STRUCTURES

A. Excavated material shall be piled a sufficient distance from the trench banks to avoid overloading to prevent slides or cave–ins.

B. Remove from site all material not required or suitable for backfill.

C. Grade as necessary to prevent water from flowing into excavations.

D. Remove all water accumulating in the excavation, from surface flow, seepage, or otherwise, by pumping or other acceptable method.

E. Sheeting, bracing or shoring shall be used as necessary for protection of the work and safety of personnel.

3.3 TRENCHING FOR PIPE

A. Trenching for Pipe – The width of trenches at any point below top of pipe shall be not greater than outside diameter of pipe plus 4 feet to permit satisfactory jointing and thorough bedding, haunching, backfilling and compacting under and around pipes. Sheeting and bracing where required shall be placed within the trench width as specified. Care shall be taken not to over–excavate. Where trench widths are exceeded, redesign with a resultant increase in cost of stronger pipe or special installation procedures shall be necessary. Cost of this re–design

and increased cost of pipe or installation shall be borne by Contractor without additional cost to the Owner. When installing pipe in a positive projecting embankment installation, the embankment shall be installed to an elevation of at least 1 foot above top of pipe for a width of five pipe diameters on each side of pipe before installation of pipe.

B. Removal of Unsuitable Material – Where wet or otherwise unstable soil, incapable of supporting the pipe is encountered in bottom of trench, such material shall be removed to depth required and replaced to proper grade with stone or sand foundation as determined by Engineer. This foundation shall be compacted to 95% modified proctor.

3.4 PROTECTION OF UTILITY LINES

A. Existing utility lines shown on drawings or locations of which are made known to the Contractor prior to excavation, and are to be retained, as well as utility lines constructed during excavation operations, shall be protected from damage during excavation and backfilling, and if damaged, shall be repaired at Contractor's expense. If the Contractor damages any existing utility lines not shown on drawings or locations of which are not known to Contractor, report thereof shall be made immediately.
If Engineer determines repairs shall be made by Contractor, such repairs will be ordered under the clause in GENERAL CONDITIONS of contract entitled "CHANGES." When utility lines to be removed are encountered within the area of operations, Contractor shall notify Engineer in ample time for necessary measures taken to prevent interruption of service.

3.5 FOUNDATION AND BEDDING

A. Stone Foundation – Where the subgrade of pipe is unsuitable material, Contractor shall remove unsuitable material to a depth determined by Engineer or Geotechnical Consultant and furnish and place stone foundation in trench to stabilize subgrade.

B. Sand Foundation – Where the character of soil is unsuitable, even though dewatered, additional excavation to a depth determined by Engineer or Geotechnical Consultant shall be made and replaced with clean sand furnished by Contractor.

C. Bedding for pipe shall provide a firm surface of uniform density throughout the entire length of pipe. Before laying pipe, trench bottom shall be de–watered by the use of well points. Where well points will not remove the water, Contractor shall construct sumps and use pumps to remove all water from bedding surface. Pipe shall be carefully bedded in stone accurately shaped and rounded to conform to lowest 1/3 outside portion of circular pipe, or lower curved portion of arch pipe for the entire length of pipe. Bell holes and depressions for joints shall be only of such length, depth, and width as required for properly making the particular type joint.

D. Concrete Pipe:

1. Materials for bedding concrete pipe shall be either Class II, Class III, or Class IB if processed, to minimize migration of adjacent material.

2. Depth of bedding shall be equal to 1/24 the outer diameter of pipe or 3 inches, whichever is greater.

3. Bedding area under the center of pipe, for a width 1/3 outer diameter of pipe, known as middle bedding, shall be loosely placed. Remainder of bedding for full width of the trench shall be compacted to a minimum density of 85% for Class II bedding and 90% for Class III bedding as determined by ASTM D1557.

E. Polyethylene and Corrugated Aluminum Alloy Pipe

1. Materials for bedding polyethylene and corrugated aluminum alloy pipe shall be either Class II, Class III, or Class IB if processed to minimize migration of adjacent materials.

2. Depth of bedding shall be equal to 1/10 the outer diameter of pipe or a minimum of 6 inches, whichever is greater.

3. Bedding area under the center of pipe, for a width 1/3 outer diameter of pipe, known as middle bedding, shall be loosely placed. Remainder of bedding for full width of the trench shall be compacted to a minimum density of 90% for Class II bedding and 95% for Class III bedding.

3.6 HAUNCHING, INITIAL BACKFILL, AND FINAL BACKFILL

A. Haunching – After the bedding has been prepared and pipe is installed, Class II or Class III soil shall be placed along both sides of pipe, in layers not exceeding 6 inches in compacted depth. Care shall be taken to insure thorough compaction and fill under haunches of the pipe. Each layer shall be thoroughly compacted with mechanical tampers and rammers. Haunching shall extend up to the spring line of pipe and be compacted to following densities:

1. RCP: Minimum density shall be 90% as determined by ASTM D1557.

2. HDPE and Corrugated Aluminum Alloy Pipe: Minimum density shall be 95% as determined by ASTM D1557.

B. Initial Backfill – HDPE and corrugated aluminum alloy pipe require initial backfill material of either Class II or Class III soils to be placed from the spring line to a minimum of 6 inches above top of pipe in 6–inch lifts. This initial backfill shall be compacted to a minimum density of 95% as determined by ASTM D1557. Reinforced concrete pipe does not specifically require initial backfill. Initial backfill for reinforced concrete pipe can be the same as final backfill.

C. Final Backfill – For all pipes, it should extend to the surface and shall be select materials compacted to a minimum of 98% as determined by ASTM D1557 if pipe is under pavement. If pipe is in grassed areas final backfill may be native materials compacted to a minimum density of 90% as determined by ASTM D1557.

3.7 PLACING PIPE

A. Each pipe shall be carefully examined before being laid and defective or damaged pipe shall not be used. Pipe lines shall be laid to the grades and alignment indicated. Proper facilities shall be provided for lowering sections of pipe into trenches. Under no circumstances shall pipe be laid in water, and no pipe shall be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary. All pipe in place shall have been checked before backfilling. When storm drain pipe terminates in a new ditch, headwall or end section, together with ditch pavement, if specified, shall be constructed immediately as called for on the plans. Ditch slopes and disturbed earth areas shall be grassed and mulched as required. Contractor will be responsible for maintaining these newly constructed ditches and take immediate action subject to acceptance, keeping erosion of the ditch bottom and slopes to a minimum during life of contract. No additional compensation will be given to Contractor for the required diversion of drainage and/or dewatering of trenches. Grassing the trench backfill shall conform to requirements of Section 02902 – "Grassing."

B. Concrete Pipe: Laying shall proceed upgrade with spigot ends of bell and spigot pipe and tongue ends of tongue and groove pipe pointing in the direction of flow. Place pipe in trench with the invert conforming to required elevations, slopes, and alignment. Provide bell holes in pipe bedding in order to insure uniform pipe support. Fill all voids under the pipe by working in backfill material.

C. Corrugated Aluminum Pipe: Shall be laid with separate sections joined firmly together, with outside laps of circumferential joints pointing upstream and with longitudinal laps on the side. Lifting lugs, where used, shall be placed to facilitate moving the pipe without damage to exterior or interior coatings. Place pipe in trench with the invert conforming to required elevations, slopes, and alignment. Fill all voids under the pipe by working in backfill material.

D. Polyethylene Pipe – Laying shall proceed upgrade with spigot ends of bell and spigot pipe pointing in the direction of flow. Place pipe in trench with the invert conforming to required elevations, slopes, and alignment. Provide bell holes in pipe bedding in order to ensure uniform pipe support. Fill all voids under the pipe by working in bedding material. Pipe shall be installed in accordance with ASTM D–2321.

E. Subgrade Drain Tubing – Shall be laid as detailed on construction drawings with the invert conforming to required elevations and alignment.

3.8 JOINTS IN PIPES

A. Concrete Pipe – Maintain pipe alignment and prevent infiltration of fill material at joints during installation. Manufacturer's recommendations and requirements shall be followed.

All joints shall receive one layer of filter fabric completely around exterior of the joint. Filter fabric shall be a minimum of 2 feet wide, centered on the joint, and overlapped a minimum of 1 foot.

B. Corrugated Aluminum Pipe – Maintain pipe alignment and prevent infiltration of fill material at joints during installation.

1. Installation of Gaskets – Shall be in accordance with recommendations of the manufacturer in regard to use of lubricants and cements and other special installation requirements. Gasket shall be placed over one end of a section of pipe for half the width of a gasket. The other half shall be doubled over end of same pipe. When adjoining section of pipe is in place, the double–over half of gasket shall then be rolled over the adjoining section. Any unevenness in overlap shall be corrected so gasket covers ends of pipe sections equally. Connecting bands shall then be centered over the adjoining sections of pipe, and rods or bolts placed in position and nuts tightened. The band shall be tightened evenly. Tension shall be kept on rods or bolts and gasket shall be closely observed to see it is seating properly in the corrugations.

2. Installation of Filter Fabric at Joint – After the connecting band has been tightened; Contractor shall place one layer of filter fabric completely around exterior of joint, a minimum of 2 feet wide, centered on joint, and overlapped a minimum of 1 foot.

C. Polyethylene and PVC Pipe – Maintain pipe alignment and prevent infiltration of fill material at joints during installation.

1. Joints shall be gasketed soil–tight and water–tight bell and spigot meeting ASTM F2306. Gaskets shall meet the requirements of ASTM F477. A joint lubricant supplied by manufacturer shall be used on the gasket and bell during assembly. Spigot end of pipe shall be inserted into bell using methods recommended by the manufacturer. Pipe shall be kept true to line and grade during assembly.
2. Installation of Filter Fabric at Joint – All polyethylene pipe joints shall receive one layer of filter fabric completely around exterior of the joint. Filter fabric shall be a minimum of 2 feet wide, centered on the joint, and overlapped a minimum of 1 foot.

D. Subgrade Drain Tubing – Joints shall be joined using snap couplings. When installing sock wrapped pipe, overlap sock ends over coupling and secure with polyethylene tape.

3.9 FIELD QUALITY CONTROL

A. Soil and density tests shall be made by a testing laboratory acceptable to the Engineer. Laboratory tests of the soil shall be made in accordance with ASTM D 1557. In–place density tests shall be made in accordance with ASTM D 6938. Results of tests shall be furnished to the Engineer.

The minimum number of tests required shall be:

Haunching and Initial Backfill in all areas….	1 per 100–linear feet of pipe, minimum of one per run of pipe for both the haunching and initial backfill zones.

Final Backfill over pipe in traffic areas……..	1 per 100–linear feet or less for each 4–feet of depth or portion thereof.
Final Backfill over pipe in non–traffic areas…..	1 per 500–linear feet or less for each 6–feet of depth or portion thereof.

The minimum percent of compaction of the backfill material (in accordance to ASTM D1557) shall be the following:

In traffic Areas. . . . . 98% of maximum laboratory density.

In non–traffic Areas . . . 90% of maximum laboratory density, unless otherwise accepted by the Engineer.

B. It is the Contractor's responsibility to assure backfill is sufficient to limit pipe deflection to no more than 5%. When flexible pipe is used, a deflection test shall be made by the Contractor on entire length of installed pipeline, not less than 30–days after completion of all backfill and placement of any fill. Deflection shall be determined by use of a deflection device or by use of a spherical, spheroidal, or elliptical ball, a cylinder, or circular sections fused to a common shaft. The ball, cylinder, or circular sections shall have a diameter, or minor diameter as applicable, of 95% the inside pipe diameter. The ball, cylinder, or circular sections shall be of a homogeneous material throughout, shall have a density greater than 1.0 as related to water at 39.2 degrees F, and shall have a surface brinell hardness of not less than 150. The device shall be center bored and through bolted with a 1/4 inch minimum diameter steel shaft having a yield strength of 70,000 p.s.i. or more, with eyes at each end for attaching pulling cables. The eye shall be suitably backed with flange or heavy washer; a pull exerted on opposite end of shaft shall produce compression throughout remote end of ball, cylinder, or circular section. Circular sections shall be spaced so the distance from external faces of front and back sections shall equal or exceed diameter of circular section. Failure of the ball, cylinder, or circular section to pass freely through a pipe run, either by being pulled through by hand or by being flushed through with water, shall be cause for rejection of a run. When a deflection device is used for the test in lieu of a ball, cylinder, or circular sections described, such device shall be given acceptance prior to use. Device shall be sensitive to 1.0% of pipe diameter being measured and shall be accurate to 1.0% of the indicated dimension. Installed pipe showing deflections greater than 5% of normal pipe diameter shall be retested by a run from the opposite direction.
If retest also fails, the suspect pipe shall be repaired or replaced at no cost to Owner.

C. 50% of pipes under roadways shall be televised and video recorded. The video observation shall include a complete pan view of each joint. If the video observation indicates problems, further televising may be required. Additional televising and video recording will be at no additional cost to the Owner.

3.10 DRAINAGE STRUCTURES

A. Drainage structures shall be constructed of materials specified for each type and in accordance with details shown on the drawings.

3.11 REMOVE AND REPLACE PAVEMENT

A. Pavement shall only be removed after prior written authorization by the Owner. Pavement removed and replaced shall be constructed in accordance with latest specifications of the State Department of Transportation. Traffic shall be maintained and controlled per State Department of Transportation regulations.

3.12 CONNECT PIPE TO EXISTING STRUCTURES

A. Contractor shall connect pipe to the existing structure where indicated. For brick or precast structures, a hole not more than 4 inches larger than outside diameter of new pipe shall be cut or cored neatly in the structure, new pipe laid so it is flush with inside face of structure, and annular space around pipe filled with a damp, expanding mortar or grout to make a watertight seal.

END OF SECTION

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SECTION 02731 – WASTEWATER COLLECTION SYSTEM

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SECTION 02731

WASTEWATER COLLECTION SYSTEM

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Sewer Pipes.

B. Manholes.

C. Connect to existing system.

D. All necessary appurtenances to collect the wastewater and deliver it to the existing system.

E. Force Main.

1.2 RELATED SECTIONS

A. Section 02204 – Earthwork.

B. Section 02667 – Water Distribution System.

C. Section 02902 – Grassing.

1.3 OPTIONS

A. The specifications describe several materials. Where manufacturers and models of equipment are named in the specifications, it is intended these are to describe quality and function required. Contractor may use equipment or materials of other manufacturers provided they are reviewed and accepted by the Engineer and Owner as equivalent to those specified.

1.4 REFERENCES (Latest Revision)

A. ASTM A 139 – Electric–Fusion (Arc) Welded Steel Pipe (NPS 4 and Over).

B. ASTM A 377 – Index of Specifications for Ductile Iron Pressure Pipe.

C. ASTM A 615/A 615 M – Deformed and Plain Carbon – Steel Bars for Concrete Reinforcement.

D. ASTM A 746 – Ductile Iron Gravity Sewer Pipe.

E. ASTM C 39/C 39M – Compressive Strength of Cylindrical Concrete Specimens.

F. ASTM C 443 – Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.

G. ASTM C 478 – Circular Precast Reinforced Concrete Manhole Sections.

H. ASTM C 890 – Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.

I. ASTM C 891 – Installation of Underground Precast Concrete Utility Structures.

J. ASTM C 913 – Precast Concrete Water and Wastewater Structures.

K. ASTM D 714 – Evaluating Degree of Blistering of Paints.

L. ASTM D–1557 – Laboratory Compaction Characteristics of Soil Using Modified Effort.

M. ASTM D 2241 – Poly (Vinyl Chloride) (PVC) Pressure–Rated Pipe (SDR Series).

N. ASTM D 2321 – Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity–Flow Applications.

O. ASTM D 2774 – Underground Installation of Thermoplastic Pressure Piping.

P. ASTM D 2794 – Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).

Q. ASTM D 3034 – Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

R. ASTM D 3139 – Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.

S. ASTM D 3212 – Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.

T. ASTM D 3740 – Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

U. ASTM D–6938 – In–Place Density and Water Content of Soil and Soil–Aggregate by Nuclear Methods (Shallow Depth).

V. ASTM E 96 – Water Vapor Transmission of Materials.

W. ASTM E 329 – Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

X. ASTM F 477 – Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

Y. ASTM F 1417 – Installation Acceptance of Plastic Non–Pressure Sewer Lines Using Low–Pressure Air.

Z. ASTM G 154 – Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for UV Exposure of Nonmetallic Materials.

AA. ASTM 924 C – Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method.

BB. AWWA C 110 – Ductile-Iron and Gray-Iron Fittings.

CC. AWWA C 111 – Rubber–Gasket Joints for Ductile Iron Pressure Pipe and Fittings.

DD. AWWA C115 – Flanged Ductile Iron Pipe with Ductile Iron or Gray Iron Threaded Flanges.

EE. AWWA C 150 – Thickness Design of Ductile Iron Pipe.

FF. AWWA C 151 – Ductile Iron Pipe, Centrifugally Cast, for Water.

GG. AWWA C 153 – Ductile-Iron Compact Fittings.

HH. AWWA C–500 – Metal–Seated Gate Valves for Water Supply Service.

II. AWWA C–509 – Resilient–Seated Gate Valves for Water Supply Service.

JJ. AWWA C 600 – Installation of Ductile Iron Water Mains and their appurtenances.

KK. AWWA C900 – Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 Inches through 60 inches, for Water Transmission and Distribution.

LL. ACI 318 – Building Code Requirements for Structural Concrete.

1.5 MEASUREMENT AND PAYMENT

A. All work, materials, and labor shall be included in the lump sum contract price.

1.6 QUALITY ASSURANCE

A. Contractor will furnish the Engineer and Owner a description of all material before ordering. Engineer will review the Contractor's submittals and provide in writing an acceptance or rejection of material.

B. Where ductile iron pipe is indicated on the plans, or required by Engineer, it shall be used.

C. Material and equipment shall be the standard products of a manufacturer who has manufactured them for a minimum of two years and provides published data on their quality and performance.

D. A subcontractor for any part of the work must have experience on similar work, and if required, furnish Engineer with a list of projects and Owners or Engineers who are familiar with its competence.

E. If Contractor wishes to furnish devices, equipment, structures, and systems not designed by Engineer, these items shall be designed by either a Professional Engineer registered in the project state or by someone Engineer accepts as qualified. If required, complete design calculations and assumptions shall be furnished to the Engineer or Owner before acceptance.

F. Testing shall be by a testing laboratory which operates in accordance to ASTM D 3740 or E 329 and shall be acceptable to Engineer prior to engagement. Mill

certificates of tests on materials made by manufacturers will be accepted provided the manufacturer maintains an adequate testing laboratory, makes regularly scheduled tests, spot checked by an outside laboratory, and furnishes satisfactory certificates with name of entity making test.

G. Infiltration, line and grade of sewer, pump performance, and hydrostatic tests on force mains shall be made by Contractor with equipment qualified by Engineer and in the presence of Engineer. Engineer or Project Representative reserves the right to accept or reject testing equipment.

1.7 PRODUCT DELIVERY, STORAGE & HANDLING

A. Material shall be unloaded in a manner avoiding damage and shall be stored where it will be protected and will not be hazardous to traffic. If stored on private property, Contractor shall obtain permission from property owner and shall repair any damage caused by the storage. Material shall be examined before installation. Neither damaged nor deteriorated material shall be used in the work. Owner and Engineer have the right to reject defective or damaged material.

1.8 JOB CONDITIONS

A. Installation of the wastewater collection system must be coordinated with other work on site. Generally, wastewater pipes will be installed first and shall be backfilled and protected so subsequent excavating and backfilling of other utilities does not disturb them. Contractor shall replace or repair any damaged pipe or structure at no additional expense to the Owner.

1.9 SEQUENCING AND SCHEDULING

A. Contractor shall arrange the work so sections of sewers between manholes are backfilled and tested, lateral sewers connected, pavement replaced, and placed in service as soon as reasonable after installation.

1.10 ALTERNATIVES

A. The intention of these specifications is to produce the best system for the Owner. If the Contractor suggests alternate material, equipment or procedures will improve results at no additional cost, Engineer and Owner will examine suggestion, and if accepted, it may be used. The basis upon which acceptance of an alternate will be given is its value to Owner, and not for Contractor's convenience.

1.11 GUARANTEE

A. Contractor shall guarantee quality of materials, equipment, and workmanship for 24 months after acceptance of the completed Project. Defects discovered during this period shall be repaired by Contractor at no cost to the Owner. The Performance Bond shall reflect this guarantee.

1.12 EXISTING UTILITIES

A. All known utility facilities are shown schematically on the construction drawings and are not necessarily accurate in location as to plan or elevation. Utilities such as service lines or unknown facilities not shown will not relieve the Contractor of responsibility under this requirement. "Existing Utilities Facilities" means any utility existing on the project in its original, relocated, or newly installed position. Contractor will be held responsible for cost of repairs to damaged underground facilities, even when such facilities are not shown on the drawings.

B. The Contractor shall call for underground utility locations before starting work. Underground utilities location service can be contacted at 1–888–721–7877 (SC) or 811.

1.13 TESTING

A. Laboratory tests for moisture density relationship for fill materials shall be in accordance with ASTM D 1557, (Modified Proctor).

B. In place density tests in accordance with ASTM D 2922.

C. Testing laboratory shall operate in accordance with ASTM D 3740 and E 329 and be acceptable to the Engineer.

D. Testing laboratory and Project Engineer/Project Representative shall be given a minimum of 48–hours' notice prior to taking any tests.

E. Testing shall be Contractor's responsibility and shall be performed at the Contractors expense by a commercial testing laboratory operating in accordance with subparagraph C above.

F. Test results shall be furnished to the Engineer and the Owner prior to continuing with associated or subsequent work.

PART 2 – PRODUCTS

Materials used in the work shall be those named in Bid Form. In multiple type bids, selection of material types will be at the opinion of Owner. Materials and products used shall conform to one of the following:

2.1 GENERAL REQUIREMENTS

A. All bolts (including Stainless Steel) threads and nuts shall be treated with an approved anti-seize lubricant, Bostik Never Seez or an approved equivalent.

2.2 SEWER PIPE

A. PVC Pipe (4"–15" Gravity Sewer) – Shall be polyvinyl chloride plastic (PVC) and shall meet all requirements of ASTM D 3034 SDR 26, except for depths less than 3 feet where ductile iron pipe must be installed. All pipe shall be suitable for use as a gravity sewer conduit.

Provisions must be made for contraction and expansion at each joint with a rubber gasket. Pipe sizes and dimensions shall be as shown below. All pipe shall be green or white in color with factory marked homing lines. Fittings shall meet the same specification requirements as pipe.

B.

Nom. Size	Outside Diameter		Min. Wall Thickness
	Average	Tolerance	SDR–26
4	4.215	± 0.009	.162
6	6.275	± 0.011	.241
8	8.400	± 0.012	.323
10	10.500	± 0.015	.404
12	12.500	± 0.018	.481

Tests on PVC Pipe – Pipe shall be designed to pass all tests at 73 ◦ F. (± 3◦ F.).

C. PVC Pipe (16-inch – 64-inch Gravity Sewer) – Shall be polyvinyl chloride plastic (PVC) and shall meet all requirements of AWWA C900 with a minimum DR of 18, except for depths less than 3 feet where ductile iron pipe must be installed. All pipe shall be suitable for use as a gravity sewer conduit. Provisions must be made for contraction and expansion at each joint with a rubber gasket. Pipe sizes and dimensions shall conform to AWWA C900. All pipe shall be green or white in color with factory marked homing lines. Fittings shall meet the same specification requirements as pipe.

Tests on PVC Pipe – Pipe shall be designed to pass all tests at 73 ◦ F. (± 3◦ F.).

D. Ductile Iron – Shall conform to AWWA C 150, AWWA C 151 and ASTM A 746. All pipe shall be Pressure Class 350 unless otherwise noted. All ductile iron pipes and fittings shall be bituminous coated on the outside and lined with Protecto 401 Ceramic Epoxy or equivalent on inside.

1. Coating on the outside shall be an asphaltic coating approximately 1 mil thick. Finished coating shall be continuous, smooth, neither brittle when cold or sticky when exposed to sun and shall be strongly adherent to the iron.

2. Protecto 401 Ceramic Epoxy or equivalent interior lining shall conform to ASTM E 96, ASTM D 714, ASTM D 2794, and ASTM G 53. Interior of the pipe shall receive 40 mils nominal dry film thickness of epoxy. Lining application, inspection, certification, handling, and surface preparation of area to receive the protective coating shall be in accordance with manufacturer's specifications and requirements.

2.3 JOINTS – GRAVITY SYSTEM

A. Joints for Ductile Iron Pipe – Shall be slip–on rubber equivalent to "Fastite," "All–tite," or "Tyton."

B. Joints for PVC Pipe – Shall be integral wall bell and spigot with a rubber ring gasket. Joints shall conform to ASTM D 3212 and gaskets to ASTM F 477.

2.3 FORCE MAIN

A. P.V.C. – All pipe shall be green in color with factory marked homing lines. Pipe with diameter less than 4 inches shall conform to all requirements of ASTM D 2241, SDR 26, Class 160. Pipe 4 inches through 18 inches shall conform to all requirements of AWWA C900 with CI outside diameter, minimum DR of 18, Pressure Class of 235 p.s.i. Joints shall be in accordance with ASTM D 3139.

B. Ductile Iron pipe shall be in accordance with Paragraph 2.1–B and conform to ASTM A 377. Push–on–Joints shall be slip–on rubber equivalent to "Fastite," "All–tite," or "Tyton." Flanged joints shall conform to AWWA C 115. Gaskets shall conform to AWWA C 111.

C. Thrust blocking shall be sized as detailed on the construction drawings of 3,000 p.s.i. concrete. Blocking shall be provided at all bends deflecting 11–1/4° degrees or more and bear directly against the undisturbed trench wall.

D. Restrained Joints – Restrained joints for pipe, valves and fittings shall be mechanical joints with ductile iron retainer glands equivalent to "Megalug" or push–on type joints equivalent to "Lok–Ring," "TR Flex," or "Super Lock" and shall have a minimum rated working pressure equal to the item restrained with a minimum safety factor of 2:1. Joints shall be in accordance with the applicable portions of AWWA C–111. Manufacturer of joints shall furnish certification, witnessed by an independent laboratory, stating joints furnished have been tested without signs of leakage or failure. Restrained joints shall be capable of being deflected after assembly.

E. Fittings:

1. Fittings for Ductile Iron or Plastic Pipe – Shall be ductile iron, manufactured in accordance with AWWA C–153. They shall be cement lined in accordance with AWWA C–104. Fittings shall be designed to accommodate the type of pipe used.

2. Fittings for Flanged Pipe – Shall be manufactured in accordance with AWWA C–110, Class 125 flanges.

3. Fittings for Plastic Pipe – Less than 4 inches shall be PVC with ring tite rubber joints conforming to ASTM D–3139.

2.4 CASING

A. Casing pipe shall be steel conforming to ASTM A 139, yield point of 35,000 p.s.i., of the diameter shown on drawings at each crossing. The minimum wall thickness shall be 0.25 inches.

2.5 CASING SPACERS

A. Casing spacers shall be bolt on style with a shell made in two sections of a minimum 14-gauge T–304 Stainless Steel. Connecting flanges shall be ribbed for extra strength. The shell shall be lined with a PVC liner. All nuts and bolts shall be T–304 Stainless Steel. Runners shall be made of Ultra High Molecular Weight Polymer with inherently high abrasion resistance and a low coefficient of friction. The combined height of supports and runners shall keep carrier pipe a minimum of 0.75–inches from casing pipe at all times. Casing Spacers shall be as manufactured by Cascade Waterworks Manufacturing Company or accepted equivalent.

2.6 MANHOLES

A. Masonry – Shall be new whole brick of good quality laid in masonry mortar or cement mortar made of one-part Portland cement and two parts clean sharp sand. Every brick shall be fully bedded in mortar. Manholes shall conform to locations and details shown on the plans.

B. Precast Concrete – Shall be reinforced concrete constructed in accordance with ASTM C 478 and details shown on the plans "Precast Concrete Manholes." Coarse aggregate shall be granite stone. The joints shall be tongue and groove sealed with flexible gaskets or mastic sealant. Gaskets shall be O–Ring or equivalent to Type A or B "Tylox" conforming to ASTM C 443. Mastic shall be equivalent to "Ram–nek" with primer. Primer shall be applied to all contact surfaces of manhole joint at the factory in accordance with manufacturer's instructions.

C. Frames and Covers – Shall be cast iron equivalent to the following:

> Neenah Foundry Co. R–1668 Type "C" Lid or U.S. Foundry USF 48 O-ring and R4-SSG cover, or equivalent. The cover shall be supplied with a side seal gasket.

D. Manhole Steps – Shall be equivalent to M.A. Industries, Type PS–1 or PS–2–PF. Steps shall be installed at the manhole factory and in accordance with recommendations of step manufacturer. Manholes will <u>not</u> be acceptable if steps are not installed accordingly.

E. Pipe Connections – Shall have flexible watertight joints at sewer main point of entry into the manhole. The joint shall be an EPDM or polyisoprene sleeve equivalent to "Kor–N–Seal."

F. Coatings – New manholes shall have all interior surfaces coated with a factory applied acrylic polymer–based coating and sealant. The coating shall be ConSeal CS–55 manufactured by Concrete Sealants, New Carlisle, Ohio or an accepted equivalent. The coating shall be applied in three coats to achieve a total dry film thickness of at least 3.5 mils in accordance with manufacturer's recommendations. Surfaces shall be cleaned of all dust, form oils, curing compounds and other foreign matter prior to the coating application.

New or existing manholes requiring a force main tie–in and the next downstream manhole shall be coated with 125 wet film mils of Raven 405 ultra-high build epoxy or an accepted equivalent. The interior surfaces shall be cleaned and prepared according to manufacturer's recommendations.

2.7 TEES AND WYES

A. Gravity sewer tees and wyes shall be four or six inches and same diameter as the run of pipe. They shall be of same material as the sewer main.

B. Wyes for cleanouts shall be of same material as the lateral pipe.

2.8 LATERALS AND CLEANOUTS

A. Shall be Ductile Iron Pipe conforming to paragraph 2.1–B, with push–on joints or Polyvinyl Chloride pipe with bells and rubber gaskets for jointing, conforming, to Paragraph 2.1–A, PVC Pipe.

B. Cleanout Access Box shall be equivalent to U.S. Foundry USF 7623 in pavement or Genova Products 4–inch Schedule 40 PVC–DWV Cleanout Fitting with threaded plug out of pavement.

2.9 STONE BEDDING

A. Shall be graded crushed granite with the following gradation:

Square Opening Size	Percent Passing
1 inch	100%
3/4 inch	90 to 100%
3/8 inch	0 to 65%
No. 4	0 to 25%

2.10 SAND BEDDING AND BACKFILL

A. Shall be clean sand free from clay and organic material. Not more than 10% shall pass the No. 100 sieve.

2.11 BORROW

A. Where it is determined sufficient suitable material is not available from the site to satisfactorily backfill pipe to at least two feet above top of pipe, Contractor shall furnish suitable sandy borrow material to accomplish requirements at no additional cost to the Owner. Material shall not have more than 60% passing the No. 100 sieve, nor more than 20% passing a No. 200 sieve.

2.12 AIR RELEASE VALVE

A. Shall be designed for sewage service. The valve shall be constructed of a cast iron body, stainless steel or bronze trim, and stainless-steel float. The inlet shall be 2 inches, 5/16-inch orifice, and a venting capacity of 35 c.f.f.a.m. The working pressure shall be 0 to 75 p.s.i. It shall conform to detail shown on the drawings.

B. Air valves shall be single body, double orifice, allowing large volumes of air to escape out the larger diameter orifice when filling a pipeline and closes watertight when the liquid enters the valve.

C. Air valves and accessories shall be supplied by a single manufacturer and shall be Valmatic Wastewater Air Release Valve Model 48A or approved equivalent.

D. A flushing assembly and hardware shall be supplied with all air relief valves and given to the Owner before substantial completion.

2.13 METAL DETECTOR TAPE

A. Will be installed above all pipe. Tape shall consist of 0.35 mils thick solid foil core encased in a protective plastic jacket resistant to alkalis, acids, and other destructive elements found in the soil. The lamination bond shall be strong enough so layers cannot be separated by hand. Total composite thickness shall be 5.0 mils. Foil core to be visible from unprinted side to ensure continuity. The tape shall have a minimum 3-inch width and a tensile strength of 35 lbs. per inch.

A continuous warning message indicating "sewer line" repeated every 16 inches to 36 inches shall be imprinted on the tape surface. Tape shall contain an opaque color concentrate designating color code appropriate to the line being buried (Sewer Line – Green).

2.14 TRACER WIRE

A. Will be used over all force main, sanitary sewer and service lateral lines. Tracer wire shall be #12 AWG High-Strength Copper Clad Steel (HS-CCS) Conductor, insulated with 30 mil High Density Polyethylene (HDPE) Insultation, and rated for direct burial. Insulation color shall meet APWA color code standards for identification of buried utilities.

B. Wire connectors shall be designed for direct burial and moisture resistance. Connectors shall be equivalent to 3M DBR/Y–6 Direct Bury Splice Kit.

2.15 CHECK VALVES

A. Shall be designed for sewage service. The valve shall be cast iron and bronze fitted. The valve shall be a spring and lever type with neoprene seat and O-Ring seals on a stainless steel valve pin, for pipe 3 inches and larger in diameter. For check valves smaller than 3 inches, the valve shall be a fully ported 150 p.s.i. rated ball check valve with a corrosion resistant phenolic base and a rubber seat. Check valve shall be of full waterway design for quiet operation and with a flow area through the valve equal to or exceeding flow area of pipe to which it is installed.

2.16 GATE VALVES

A. Two Inches and Larger – Shall be cast iron or ductile iron body, bronze mounted, double disc or resilient wedge design, with non–rising stems, conforming to AWWA C 500, C 509, or C 515. Valves shall have ends to match the pipe to which they are attached. Attachment to plastic pipe shall be made by special adapters. Valves shall have a working pressure of 200 p.s.i. and be tested at 400 p.s.i.

Valves shall be furnished with "O" ring packing. One "O" ring shall be located above the thrust collar and one below. Thrust collar shall be permanently lubricated and have an anti–friction washer on top of the thrust collar.

B. Smaller than 2 inches – Shall be all brass, ball valve type. The pressure rating shall be 175 p.s.i.

C. Valve Boxes – Underground valves shall be installed in acceptable valve boxes. Valve boxes shall have a suitable base that does not damage valve or pipe, and shaft extension sections to cover and protect the valve and permit easy access and operation. The box, cover, and extensions shall be cast or ductile iron having a crushing strength of 1,500 pounds per linear foot.

2.17 PLUG VALVES

A. Shall be fully ported and of the same diameter as pipes to which they are attached. They shall have semi–steel bodies, all metal plugs, stainless steel bearings, and be equivalent to DeZurik 100% port eccentric (PEF) valves, lever operated. All valves 6 inches and larger shall be equipped with gear actuator and handwheel.

B. Eccentric type plug valves shall be used for wastewater and sludge service and shall be Dezurik or approved equivalent.

C. Valves shall be of non-lubricated or permanently lubricated type; shall have bodies of cast iron, ASTM A126 Grade B; shall have discs or plugs of ductile iron ASTM A536 or semi-steel; and shall have corrosion-resistant bearings, bushings, and journals.

D. Valve ends shall be flanged ANSI B16.1, Class 125 except when installed underground. Valves for underground service shall be equipped with mechanical joint ends.

E. Valves shall be rated at 150 psi working pressure, bi-directional.

F. Finishes:

1. All wetted surfaces shall be made corrosion resistant by application of coatings, fusion-bonded nylon or epoxy.
2. Exterior surfaces of valves to be installed in buried installations shall receive coal tar coating, not less than 6 mils dry film thickness.
3. Exterior surfaces of valves not installed in buried locations shall receive rust-inhibitive primer, not less than 3 mils dry film thickness.

G. Valve Operators:

1. Valves shall operate from fully closed to fully open with 90° turn.

2. Valves shall have full port openings of not less than 82% of connecting pipe areas; and shall be equipped with indicating quadrants, pointers, adjustable stops and locks.
3. Geared operators shall be of traveling-nut type, sealed, gasketed and lubricated; and operators shall be designed to resist submergence in water to 25 ft. head pressure.
4. All valves greater than twelve inches (12") in size (for any service) shall be equipped with worm-and-gear operators and handwheels.

2.18 PRODUCT REVIEW

A. Contractor shall provide the Engineer with a complete description of all products before ordering. Engineer will review all products before they are ordered by Contractor.

PART 3 – EXECUTION

3.1 CONSTRUCTION OBSERVATION

A. The line, grade, deflection, and infiltration of sewers [and pump station operation] shall be tested by Contractor under the direction of Engineer. Engineer or Project Representative will have the right to require any portion of work be completed in their presence. If work is covered up after such instruction, it shall be exposed by Contractor for observation. However, if Contractor notifies Engineer such work is scheduled and Engineer fails to appear within 48 hours, the Contractor may proceed. All work completed and materials furnished shall be subject to review by the Engineer or Project Representative. All improper work shall be reconstructed. All materials not conforming to requirements of specifications shall be removed from the work upon notice being received from Engineer for rejection of such materials. Engineer shall have the right to mark rejected materials to distinguish them as such.

Contractor shall give the Project Engineer or Project Representative a minimum of 48 hours' notice for all required observations or tests.

It will also be required by Contractor to keep accurate, legible records of the location of all sanitary lines, service laterals, manholes, force mains, valves, bends, and appurtenances. These records will be prepared in accordance with the requirements of "Record Data and Drawings". Final payment to the Contractor will be withheld until all such information is received and accepted.

3.2 LOCATION AND GRADE

A. Line and grade of sewers and position of all manholes and other structures are shown on the drawings. Grade line as given on the profile or mentioned in these specifications means invert or inside bottom of pipe. Price for trenching shall include trench for depth below this line necessary to lay sewer to grade, but measurements for payment will be made only to grade line. The Contractor shall be responsible for proper locations and grades of sewers.

3.3 SEWER EXCAVATION

A. Contractor shall perform all excavations of every description and of whatever substance encountered to the depth shown on the plans or specified for all sewers, manholes, and other appurtenances. All excavations shall be properly dewatered before installations are made, by the use of well points, pumping, or other methods accepted by Engineer. Trenches shall be excavated in conformance with the Occupational and Safety Health Administration's (OSHA) Regulations.

Where the character of soil is unsuitable for pipe bedding as determined by Engineer or Geotechnical Consultant, additional excavation will be authorized. Engineer or Geotechnical Consultant shall determine the depth needed for additional bedding and whether material will be sand or stone. The unsuitable material shall be disposed of at Contractor's expense in a proper manner. Bottom of all trenches shall be rounded to conform to the bottom of pipe, to afford full bearing on pipe barrel. Excavation in excess of depths and widths required for sewers, manholes, and other structures shall be corrected by pouring sub foundations of 3,000 p.s.i. concrete and half cradle at the Contractor's expense.

B. Trenches shall not be excavated more than 400 feet in advance of pipe laying.

3.4 TRENCH WALL SUPPORT

A. Bracing and Sheeting – The sides of all trenches shall be securely held by stay bracing, or by skeleton or solid sheeting and bracing, as required by soil conditions encountered, to protect adjoining property and for safety. Where shown on drawings or where directed by Engineer, the Contractor must install solid sheeting to protect adjacent property and utilities. Sheeting shall be steel, or timber and Contractor shall submit design data, including the section modulus of members and arrangement for bracing at various depths, to Engineer for review before installing sheeting. It shall penetrate at least 3–feet below the pipe invert. Contractor shall ensure support of pipe and its embedment is maintained throughout installation and ensure sheeting is sufficiently tight to prevent washing out of the trench wall from behind sheeting.

B. Sheeting Removal – Sheeting shall be removed in units and only when backfilling elevation has reached the level necessary to protect pipe, adjoining property, personnel, and utilities. Removal of sheeting or shoring shall be accomplished in a manner to preclude loss of foundation support and embedment materials. Fill voids left on removal of sheeting or shoring and compact all materials to required densities.

C. Movable Trench Wall Supports – Do not disturb installed pipe and its embedment when using movable trench boxes and shields. Movable supports should not be used below top of pipe zone unless acceptable methods are used for maintaining the integrity of embedment material. Before moving supports, place and compact embedment to sufficient depths to ensure protection of the pipe. As supports are moved, finish placing and compacting embedment.

D. When sheeting or shoring cannot be safely removed, it shall be left in place. Sheeting left in place shall be cut off at least 2 feet below the surface. No separate payment shall be made for bracing and sheeting except where shown on drawings or authorized by the Engineer.

3.5 LAYING PIPE

A. All sewer pipe shall be laid upgrade with spigots pointing downgrade and in accordance with ASTM D 2321. The pipe shall be laid in a ditch prepared in accordance with Paragraph 3.3 "Sewer Excavation." When sewer is complete, the interior surface shall conform on bottom accurately to grades and alignment fixed or given by Engineer. Special care shall be taken to provide a firm bedding in good material, select borrow, stone backfill or 3,000 p.s.i. concrete, as authorized, for length of each joint and 1/2 of the circumference. Holes shall be provided to relieve bells from bedding strain, but not so large to allow separation of the bell from barrel by settlement after backfilling. All pipe shall be cleaned out and left clean. Every third joint shall be filled around immediately after being properly placed.

B. Jointing – Comply with manufacturer's recommendations for assembly of joint components, lubrication, and making joints. When pipe laying is interrupted, secure piping against movement and seal open ends to prevent the entrance of water, mud, or foreign material.

C. Placing and Compacting Pipe Embedment – Place embedment materials by methods that will not disturb or damage the pipe. Work in and tamp haunching material in area between the bedding and underside of pipe before placing and compacting remainder of embedment in pipe zone. Do not permit compaction equipment to contact and damage the pipe. Use compaction equipment and techniques compatible with materials used and location in the trench. Before using heavy compaction or construction equipment directly over the pipe, place sufficient backfill to prevent damage, excessive deflections, or other disturbance of the pipe.

D. Rock or Unyielding Materials in Trench Bottom – If ledge rock, hard pan, shale, or other unyielding material, cobbles, rubble, debris, boulders, or stones larger than 1.5–inches are encountered in the trench bottom, excavate a minimum depth of 6–inches below pipe bottom and replace with proper embedment material.

E. Vertical Risers – Provide support for vertical risers as commonly found at service connections, cleanouts, and drop manholes to preclude vertical or lateral movement. Prevent the direct transfer of thrust due to surface loads and settlement and ensure adequate support at points of connection to main lines.

F. Exposing Pipe for Making Service Line Connections – When excavating for a service line connection, excavate material from above the top of main line before removing material from sides of pipe. Materials and density of service line embedment shall conform to specifications for the main line.

G. Cleanouts and access boxes shall be installed as shown on the construction drawings. Install concrete collar around access box as shown on detail.

H. Manhole Connections – Use flexible water stops, resilient connectors, or other flexible systems acceptable to the Engineer making watertight connections to manholes and other structures. Fill annular space between pipe and precast concrete on inside of manhole with non–shrink grout.

I. Jacking and Boring – Steel casing of diameter shown on the plans shall be jacked and bored in location indicated. Joints between sections of the steel casing shall be of a continuous weld made by a certified welder. Jacking and boring shall be in accordance with South Carolina Department of Transportation Standard Specifications. Carrier pipe shall be installed as shown on the detail. After carrier pipe has been installed, ends of the casing shall be sealed using a rubber enclosure and stainless-steel straps or brick and mortar.

Where work involves a highway, a Resident Engineer of the State Department of Transportation shall be notified 3 days before crossing is started. Where work involves a railroad, the work shall conform to requirements of AREA specifications. Division Superintendent of the Railroad shall be notified 3 days prior to beginning work. Before commencing work within the right–of–way of railroads or highways, Contractor shall verify Owner has obtained required permits.

3.6 SEPARATION BETWEEN WATER AND SANITARY SEWER

A. Parallel Installation:

1. Water mains shall be laid at least 10 feet horizontally from any existing or proposed sanitary sewer, storm sewer, or sewer manhole. The distance shall be measured edge–to–edge.

2. When conditions prevent a horizontal separation of 10 feet, water main may be laid closer to a sewer (on a case–by–case basis) provided the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation where bottom of water main is at least 18 inches above top of sewer. It is advised the sewer be constructed of materials and with joints equivalent to water main standards of construction and be pressure tested to assure water–tightness prior to backfilling.

B. Crossing:

1. Water mains crossing house sewers, storm sewers, or sanitary sewers shall be laid to provide a separation of at least 18 inches between the bottom of water main and top of sewer. At crossings, one full length of water pipe shall be located so both joints will be as far from the sewer as possible. Special structural support for the water and sewer pipes may be required.

2. When conditions prevent a vertical separation of 18 inches, the sewer passing over or under water mains shall be constructed of materials and with joints equivalent to water main standards of construction and shall be pressure tested to assure water–tightness prior to backfilling.

3. When water mains cross under sewers, additional measures shall be taken by providing:

   a. a vertical separation of at least 18 inches between bottom of the sewer and top of water main.

   b. adequate structural support for sewers to prevent excessive deflection of joints settling on and breaking the water mains.

   c. length of water pipe be centered at the point of crossing so joints will be equidistant and as far as possible from sewer; and

   d. both sewer and water main shall be constructed of water pipe and subjected to hydrostatic tests, as prescribed in this document. Encasement of the water pipe in concrete shall also be considered.

   e. crossings shall conform to South Carolina Department of Health and Environmental Control's Bureau of Water Standards for Wastewater Facility Construction: Regulation 61–67.

3.7 BACKFILLING

A. All trenches and excavation shall be backfilled immediately after pipes are laid therein, unless other protection of the pipeline is directed. Backfilling material shall be selected and deposited with special reference to the future safety of pipes. Except where special methods of bedding and tamping are provided for, clean earth or sand shall be solidly tamped about pipe up to a level at least 2 feet above top of pipes, and shall be carefully deposited to uniform layers, each layer solidly tamped or rammed with proper tools to not injure or disturb the pipeline. Remainder of the trench backfilling shall be carried on simultaneously on both sides of pipe in such a manner preventing injurious side pressure. The material used shall be selected from excavations anywhere on site if any of this soil is suitable. Backfill material shall be clean and free of rock, organic and other deleterious matter.

Under traffic areas, the top 24 inches of backfill material shall be compacted to a density of not less than 98% of maximum laboratory density at optimum moisture. Below the 24–inch line and to and including area around pipe, density shall not be less than 95% of maximum laboratory density at optimum moisture. In non–traffic areas, the backfill material shall be compacted to a density of not less than 90% of maximum laboratory density at optimum moisture unless otherwise accepted by Engineer. Compaction tests shall be conducted in accordance with ASTM D 6938 by an independent testing laboratory. Tests are to be taken at the direction of Engineer.

Whenever trenches have not been properly backfilled, or if settlement occurs, they shall be refilled, smoothed off and finally made to conform to the ground surface. Backfilling shall be carefully performed, and original surface restored to the full satisfaction of Engineer immediately after installation.

Where thermoplastic (PVC) pipe is installed, Contractor shall take precautions in accordance with ASTM D 2321, during backfilling operations so not to create excessive side pressures, or vertical or horizontal deflection of the pipe nor impair flow capacity.

3.8 MANHOLES

A. Manholes shall be constructed where shown on the drawings or where directed by Engineer. The channel in bottom of manholes shall be smooth and properly rounded. Special care must be exercised in laying the channel and adjacent pipes to grade. Manhole top elevations shall be greater than or equal to the 50–year flood elevation, unless watertight covers are provided. Tops of manholes outside of roads shall be built to grades 1–inch above ground surface in developed areas and 6 inches above ground surface in undeveloped areas unless otherwise shown on the plans. Manholes in roads shall be built to grades designated by the Engineer. Manhole sections with either honeycomb defects; exposed reinforcing; broken/fractured tongue or groove; or cracked walls will be subject to rejection by Engineer for use on the project. When mastic sealant is used, improperly applied primer will also be cause for rejection.

No leaks in any manhole will be acceptable. All repairs made from inside the manhole shall be made with mortar composed of one-part Portland cement and two parts clean sand. The mixing liquid shall be straight bonding agent equivalent to "Acryl 60."

3.9 STONE BEDDING

A. Where, in the Engineer's or Geotechnical Consultant's opinion, subgrade of pipe trench is unsuitable material and additional stone bedding beyond the minimum depth required by the details, Contractor shall remove unsuitable material to a depth determined by Engineer or Geotechnical Consultant and furnish and place additional stone backfill in trench to stabilize subgrade. Presence of water does not necessarily mean stone backfill is required. If well points or other types of dewatering will remove the water, Contractor shall be required to completely dewater trench in lieu of stone backfill. Additional stone bedding will be limited to areas where well pointing and other conventional methods of dewatering will not produce a dry bottom. Stone shall be placed at least 4 feet wider than the outside diameter of pipe. The pipe shall be carefully bedded in stone as specified, or in accordance with manufacturer's recommendations.

3.10 SAND BEDDING AND BACKFILL

A. Where, in the Engineer's or Geotechnical Consultant's opinion, character of soil is unsuitable for pipe bedding, even though dewatered, additional depth of excavation as determined by Engineer or Geotechnical Consultant shall be made and replaced with clean sand or stone furnished by Contractor.

3.11 DEFLECTION

A. It is the Contractor's responsibility to assure backfill is sufficient to limit pipe deflection to no more than 5%. When flexible pipe is used, a deflection test shall be made by Contractor on the entire length of installed pipeline, not less than 30–days after completion of all backfill and placement of any fill. Deflection shall be determined by use of a deflection device or by use of a spherical, spheroidal, or elliptical ball, a cylinder, or circular sections fused to a common shaft. Ball, cylinder, or circular sections shall have a diameter, or minor diameter as applicable, of 95% the inside pipe diameter. The ball, cylinder, or circular sections shall be of a homogeneous material throughout, shall have a density greater than 1.0 as related to water at 39.2 degrees F, and shall have a surface brinell hardness of not less than 150. The device shall be center bored and through bolted with a 1/4-inch minimum diameter steel shaft having a yield strength of 70,000 p.s.i. or more, with eyes at each end for attaching pulling cables. The eye shall be suitably backed with flange or heavy washer; a pull exerted on opposite end of shaft shall produce compression throughout remote end of ball, cylinder, or circular section. Circular sections shall be spaced so distance from the external faces of front and back sections shall equal or exceed diameter of circular section. Failure of the ball, cylinder, or circular section to pass freely through a pipe run, either by being pulled through by hand or by being flushed through with water, shall be cause for rejection of individual run. When a deflection device is used for the test in lieu of a ball, cylinder, or circular sections described, such device shall be acceptable to Engineer prior to use. Device shall be sensitive to 1.0% of diameter of pipe being measured and shall be accurate to 1.0% of indicated dimension.

Installed pipe showing deflections greater than 5% of the normal diameter of pipe shall be retested by a run from opposite direction. If retest also fails, the suspect pipe shall be repaired or replaced at no cost to Owner.

3.12 LEAKAGE

A. In no stretch of sewer between any two adjoining manholes shall infiltration/exfiltration exceed 25 gallons/day/inch of pipe diameter per mile of pipe. In case leakage exceeds this amount, the sewer shall not be accepted until such repairs and replacements are made to comply with above requirements. Such corrections will be made at the Contractor's expense. All visible leaks shall be repaired, regardless of the amount of leakage.

B. Lines shall be tested for leakage by low pressure air testing, infiltration tests, or exfiltration tests, as appropriate. Low pressure air testing for PVC pipe shall be as prescribed in ASTM F 1417. Prior to infiltration or exfiltration tests, trench shall be backfilled up to at least the lower half of pipe. If required, sufficient additional backfill shall be placed to prevent pipe movement during testing, leaving the joints uncovered to permit inspection. Visible leaks encountered shall be corrected regardless of leakage test results. When water table is 2 feet or more above top of pipe at the upper end of pipeline section to be tested, infiltration shall be measured using a suitable weir or other device acceptable to Engineer. When Engineer determines infiltration cannot be properly tested, an exfiltration test shall be made by filling the line to be tested with water so a head of at least 2 feet is provided above both water table and top of pipe at upper end of pipeline to be tested.

The filled line shall be allowed to stand until pipe has reached its maximum absorption, but not less than 4 hours. After absorption, the head shall be re–established. The amount of water required to maintain this water level during a 2–hour test period shall be measured. Leakage as measured by either the infiltration test or exfiltration test shall not exceed 25 gallons per inch diameter per mile of pipeline per day. When leakage exceeds the maximum amount specified, satisfactory correction shall be made and retesting accomplished. Testing, correction, and retesting shall be made at no additional cost to the Owner.

C. The Contractor shall furnish equipment and plugs and subject force mains to hydrostatic tests at 100 p.s.i. for a period of two hours. Any leaks shall be located and repaired. Each section tested shall be slowly filled with water, care being taken to expel all air from the pipes. No pipe installation will be accepted until leakage during pressure test is less than the number of gallons listed for each 1000–feet of pipe tested:

6 inches and less – 0.9 gallons	12 inches – 1.80 gallons
8 inches – 1.20 gallons	14 inches – 2.10 gallons
10 inches – 1.50 gallons	16 inches – 2.40 gallons

3.13 CLEANING AND ACCEPTANCE

A. Before acceptance of sewer system, it shall be tested and cleaned to the satisfaction of Engineer. Where any obstruction is met, Contractor will be required to clean sewers by means of rod and swabs or other instruments. The pipeline shall be straight and show a uniform grade between manholes. The Engineer shall check lines by lamping or other methods to determine final acceptance.

3.14 CLOSING PIPE

A. When work or pipe installation is suspended, either for the night or at other times, end of sewer must be closed with a tight cover. Contractor will be held responsible for keeping the sewer free from obstruction.

3.15 PARTIAL ACCEPTANCE OF THE WORK

A. Owner reserves right to accept and use any part of the work. Engineer shall have power to direct on what line the Contractor shall work and order thereof.

3.16 GRASSING

A. Grassing of areas disturbed during construction shall be in accordance with Section 02902 – "Grassing."

3.17 RECORD DATA

A. It will be required of the Contractor to keep accurate, legible records, locating all sewers, force mains, tees, and laterals. These records will be made available to Engineer before final review. Final payment to the Contractor will be withheld until all such information is received and accepted.

3.18 REMOVE AND REPLACE PAVEMENT

A. Pavement shall only be removed after prior written authorization by the Owner. Pavement removed and replaced shall be constructed in accordance with latest specifications of the State Department of Transportation. Traffic shall be maintained and controlled per State Department of Transportation regulations.

Edges of the pavement shall be cut to a neat straight line with a masonry saw. Backfill shall be compacted and tested and a concrete base course of 5,000 p.s.i. placed on the fill as shown on details. The concrete base shall be placed within 24 hours after pipeline is installed. A temporary wearing surface may be used provided it presents a smooth surface. The final wearing surface shall be 2 inches Type C asphaltic concrete.

3.19 METALLIC DETECTOR TAPE

A. Contractor shall place metallic detector tape, suitably coded, directly over all installed pipes at a depth of 18 inches below the finished surface.

3.20 TRACER WIRE

A. Tracer wire will be installed on all force mains, sanitary sewer and service laterals directly on top of the pipe. Wire shall be secured to the pipe with tape or other acceptable methods at spacings of no more than 36–inches apart. Where service laterals connect to main lines, the wire connection shall be made with a direct bury moisture resistant connector. Installation of connector shall be per manufacturer's instructions. The insulated wire must maintain electrical continuity. This tracer wire system shall be checked and tested by the Contractor, in presence of Engineer or Owner prior to acceptance of force main sanitary sewer and service laterals. All equipment, meters, detectors, etc., needed for testing shall be furnished by the Contractor.

3.21 CONNECT SEWERS TO EXISTING STRUCTURES

A. Contractor shall connect the system to existing structures where indicated. For brick structures, a hole not more than 4 inches larger than the outside diameter of new pipe shall be cut neatly in structure, new pipe laid so it is flush with inside face of structure, and annular space around pipe filled with a damp, expanding mortar or grout to make a watertight seal. For precast structures, core proper size hole in structure for pipe being connected, attach flexible sleeve into cored hole and connect new pipe into flexible sleeve with a stainless-steel band.

B. The Contractor shall furnish the necessary pipe and perform all excavation, dewatering, sharing, backfilling, etc., necessary to make the connection of a new main to the existing sewer system. The Contractor shall contact IOPWSC a minimum of 72 hours in advance of construction. The Contractor shall be responsible for coordinating his construction with the utility operator.

3.22 FIELD QUALITY CONTROL

A. Soil and density tests shall be made by a testing laboratory acceptable to the Engineer. Laboratory tests of the soil shall be made in accordance with ASTM D 1557. In–place density tests shall be made in accordance with ASTM D 6938. Results of the tests shall be furnished to the Engineer.

The minimum number of tests required shall be:

Backfill over sewer in traffic areas.....	1 per 100 linear feet or less for each 4 feet of depth or portion thereof.
Backfill over sewer in non–traffic areas...	1 per 500 linear feet or less for each 6 feet of depth or portion thereof.

3.23 AIR RELEASE VALVE

A. The manhole and installation of valve shall be in accordance with detail on drawings. Prior to deciding on the location of any air release valve, Contractor shall provide Engineer with an accurate profile of installed force main so high points in system can be determined.

3.24 FORCE MAIN

A. Ductile Iron Force Mains shall be installed in accordance with AWWA C 600.

B. PVC Force Main shall be installed in accordance with ASTM D 2774.

C. The Contractor shall perform excavation of whatever substances are encountered to a depth that will provide a minimum cover over the top of the pipe of 48 inches from the existing or proposed finished grade.

D. Alignment and Grade – The force mains shall be laid and maintained on lines and grades established by the plans and specifications for the project. Fittings, valves, and tapped or bossed outlets must be installed at the required locations unless field conditions warrant otherwise, and these changes are approved in accordance with the specifications. Valve-operating stems shall be oriented to allow proper operation.

E. Prior Investigation – Prior to excavation, an investigation shall be conducted to determine the location of existing underground structures and conflicts. During excavation, damage to existing structures should be avoided. Special precautions shall be taken when the force main being installed crosses or is adjacent to a facility that is cathodically protected.

F. Unforeseen Obstructions – When obstructions not indicated on the plans interfere with the progress of work, an alteration of the plans is required. These alterations or deviation in line and grade, or the removal, relocation, or reconstruction of the obstructions shall be performed in accordance with the specifications.

G. Trench Construction – The trench shall be excavated to the required alignment, depth, and width specified or shown on the plans and shall conform with all federal, state or provincial, and local regulations for the protection of the workers.

1. Trench Preparation – Trench preparation shall proceed in advance of pipe installation as stated in the specifications.

2. Discharges from trench dewatering pumps shall be directed away from the trench to prevent trench instability and shall be in accordance with federal, state or provincial, and local point-discharge requirements.

3. Excavated material shall be placed in a manner that will not obstruct the work nor endanger the workers or the public, or obstruct sidewalks, driveways, roadways, or other structures. Excavated material shall be placed in compliance with federal, state or provincial, and local regulations.

4. Width – The width of the trench at the top of the pipe shall equal the single-pass capabilities of normally available excavating equipment. The width shall permit the pipe to be laid and joined properly and to allow the backfill to be placed in accordance with the specifications. Trench widths shown below may be used as a guide. When required, trenches shall be wider to permit the placement of timber supports, sheeting, bracing, and appurtenances as required by the safety requirements of the agency having jurisdiction.

Nominal Pipe Size		**Trench Width**	
In.	**(mm)**	**In.**	**(mm)**
3 and 4	(76 and 102)	28	(0.71)
6	(152)	30	(0.76)
8	(203)	32	(0.81)
10	(254)	34	(0.86)
12	(305)	36	(0.91)
14	(356)	38	(0.97)
16	(406)	40	(1.02)
18	(457)	42	(1.07)
20	(508)	44	(1.12)
24	(610)	48	(1.22)
30	(762)	54	(1.37)
36	(914)	60	(1.52)
42	(1,067)	66	(1.68)
48	(1,219)	72	(1.83)
54	(1,400)	78	(1.98)
60	(1,500)	84	(2.13)
64	(1,600)	88	(2.24)

5. Bell Holes – Holes for the bells shall be provided at each joint, and they shall be no larger than necessary to allow joint assembly and to ensure the pipe barrel will lie flat on the trench bottom. The dimensions of bell-hole depressions for push-on type joints should be large enough to ensure the pipe is not resting on the bells and is supported by the full length of the pipe barrel.

6. Other than noted previously, the trench bottom shall be true and even to provide support for the full length of the pipe barrel. A slight depression may be provided to allow withdrawal of pipe slings or other lifting tackle without damaging coating or polyethylene encasement.

7. Rock Conditions – When excavation of rock is necessary, all rock shall be removed to provide a clearance below and on each side of all pipe and fittings of at least 6 in. (150 mm) for nominal pipe sizes 24 in. (610 mm) or smaller and 9 in. (230 mm) for nominal pipe sizes 30 in. (762 mm) and larger. When excavation is completed, a layer of appropriate backfill material shall be placed on the bottom of the trench to the appropriate depths, then leveled and tamped.

8. In all cases, the specified clearances shall be maintained between the bottom of all pipe and appurtenances and any part, projection, or point of rock, boulder, or stone of sufficient size and placement that could cause a fulcrum point or point load.

9. Previous Excavations–If the trench passes over a previous excavation, the trench bottom shall be sufficiently compacted to provide support equal to that of the native soils or conform to other regulatory requirements in a manner that will prevent damage to the existing installation.

H. Protecting Property–Trees, shrubs, fences, and all other property and surface structures shall be protected during construction, unless their removal is shown in the plans and specifications.

1. All properties that have been disturbed shall be restored as completely as practical to their original condition.

I. Any cutting of tree roots or branches shall be performed in accordance with the specifications.

J. Temporary support, adequate protection, and maintenance of all underground and surface structures, drains, sewers, and other obstructions encountered during the work shall be provided in accordance with specifications or applicable regulations.

K. Installing Pipe – The proper implements, tools, and facilities shall be provided and used for the safe and convenient performance of the work. All pipe, fittings, valves, and other appurtenances shall be lowered carefully into the trench using a backhoe, a crane, ropes, or other suitable tools or equipment, in such a manner as to prevent damage to force main materials and protective coatings and linings. Under no circumstances shall force main materials be dropped or dumped into the trench. Where practical, the trench should be dewatered prior to installation of the pipe.

K. Examining Material – All pipe, fittings, valves, and other appurtenances shall be examined carefully for damage and other defects immediately before installation. Defective materials shall be marked and held for final disposition as required by the specifications.

L. Pipe Ends – All lumps, blisters, and excess coating shall be removed from the socket and plain ends of each pipe and the outside of the plain end and the inside of the bell shall be wiped clean and dry and be free from dirt, sand, grit, or any foreign materials before the pipe is laid.

M. Pipe Cleanliness – Foreign material shall be prevented from entering the pipe while it is being placed in the trench. No debris, tools, clothing, or other materials shall be placed in the pipe at any time.

N. Pipe Placement – As each length of pipe is placed in the trench, the joint shall be assembled, and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.

O. Direction of Bells – It is common practice to lay pipe with the bells facing the direction in which work is progressing; however, it is not mandatory. For example, when the main is being laid on a slope, the pipe is frequently laid with the bells facing uphill for ease of installation.

P. Pipe Plugs – At times when pipe-laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means as specified. The plug shall be fitted with a means for venting. When practical, the plug shall remain in place until the trench is pumped completely dry. Care must be taken to prevent pipe flotation, if the trench fills with water.

Q. Prior to removal of the plug for extending the line or for any other reason, air and/or water pressure in the line shall be released.

R. Joint Assembly – Shall be performed in accordance to AWWA C 600.

S. Hydrostatic Testing – Shall be performed in accordance with AWWA C 600.

T. Crossings with water mains shall conform to South Carolina Department of Health and Environmental Control's Bureau of Water Standards for Wastewater Facility Construction: Regulation 61-67.

3.25 BYPASSING

A. Bypassing of raw wastewater onto the ground or into a receiving stream is prohibited.

B. Bypassing shall be accomplished with pumping equipment sufficient to maintain the flow of wastewater. Contractor shall provide pump, hoses, materials, and labor to operate and maintain the bypassing operation. A backup pump shall also be made available by the Contractor. Bypassing operations shall be reviewed and acceptable to the sewer system operator before being implemented.

END OF SECTION

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SECTION 02902

GRASSING

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Seeding, planting grass, and fertilizing graded areas behind the structures, pipeline rights-of-way, roadway shoulders and other disturbed areas.

B. Seed protection.

C. Maintaining seeded areas until final acceptance.

1.2 RELATED WORK

A. Civil and Landscape plans and specifications.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Deliver grass seed in original containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of packaging, and location of packaging. Damaged packages are not acceptable. Store in cool, dry locations away from contaminants.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer. Damaged bags are not acceptable. Store in cool, dry locations away from contaminants.

C. Deliver sod on pallets.

D. All material shall be acceptable to Engineer prior to use.

1.4 PLANTING DATES

A. This specification provides for establishment of a permanent grass cover between the dates of March 1 and September 30. If finished earth grades are not completed in time to permit planting and establishment of permanent grass during the favorable season between dates specified above unless otherwise accepted, Contractor will be required to plant a temporary cover to protect new graded areas from erosion and to keep windborne dust to a minimum. The temporary cover shall be planted between October 1 and February 28 unless otherwise permitted.

1.5 MEASUREMENT AND PAYMENT

A. When the season or stage of project is such results of grassing work cannot be determined, conditional acceptance will be made on work completed. When conditional acceptance is made for items of work covered, Contractor shall be entitled to 50% of bid price for the actual work placed and shall receive remaining 50% of bid price when final acceptance is made.

Conditional acceptance shall not apply to the remaining items of work, and full bid price payment shall be made when work is acceptably placed and completed in accordance with specifications.

B. Payment for grassing will be made at contract unit price for the item "Sodding" and such payment shall constitute full compensation for furnishing and placing seed and fertilizer or sod where directed and protecting and maintaining seed and sod in all graded and disturbed areas.

PART 2 – PRODUCTS

A. Contractor shall submit source and species certification documents to Engineer and Owner's Representative for review prior to installation. Supply complete information on all analysis/test methodologies and results; laboratory certifications, manufacturer's specifications, and agency approvals to the Landscape Architect/Project Engineer prior to placement of soil mixtures. In addition, provide the Landscape Architect/Project Engineer with thoroughly mixed sample of soil mixes for acceptance prior to placement. Landscape Contractor shall make modifications and improvements to soil mixes deemed necessary by the soil analysis to meet requirements specified here in before, and to ensure proper growing medium for plant material.

2.1 SEED

A. All seed shall conform to State Laws and requirements and regulations of the State Department of Agriculture.

B. The varieties of seed, as specified in Section 2.2, shall be individually packaged or bagged, and tagged to show name of seed, net weight, origin, germination, lot number, and other information required by the State Department of Agriculture.

C. Engineer reserves the right to test, reject, or accept all seed before seeding.

2.2 SEEDING SCHEDULE

A.

SEED	RATE	PLANTING DATES
Bermuda	50-lbs/acre	March 1 – September 30
Rye	75-lbs/acre	October 1 – February 28

2.3 FERTILIZER

A. Commercial fertilizer of accepted type, conforming to State fertilizer laws at the rate as recommended by soils test.

2.4 LIME

A. Agricultural grade, ground limestone at the rate as recommended by soils test.

2.5 SPRIG

A. Healthy living stems, stolons, or rhizomes and attached roots of locally adapted grass without adhering soil, including two to three nodes and from 4 to 6 inches long. Obtain from heavy, dense certified sod. Provide sprigs which have been grown under climatic conditions similar to those in the locality of project. Coordinate harvesting and planting operations to prevent exposure of sprigs to the sun for more than 30 minutes before covering and moistening. Sprigs showing signs of wilt, mold, containing weeds or other detrimental material or are heat damaged will be rejected.

B. Varieties of sprig, as specified in section 2.6, shall be individually packaged or bagged, and tagged to show name of sprig, net weight, origin, and other information required by the State Department of Agriculture.

C. Sprigs shall be pure to variety specified and shall be free of other grass species, weeds or foreign matter.

D. Sprigs shall be harvested by digging (not collected above soil level), shredding sod, rototilling sod and raking, vericutting, or with a sprig harvester. Sprigs shall consist of mostly rhizomes and crowns with only a few green leaves.

2.6 SPRIGGING SCHEDULE

A.

SPRIG	RATE	PLANTING DATES
'Tifsport' Bermuda	1,000 bushels/acre (Maximum 12 week grow-in)	April 1 – August 31
Stabilize site with temporary grass seed		September 1 – March 31 (See section 2.2)

B. In areas where existing grass is to be matched, Contractor shall sprig at the rate and dates recommended by sprig distributor.

2.7 SOD

A. Sod shall be premium grade, densely rooted, good quality grass of the species and certified variety as shown on the plans, free from noxious weeds with no surface soil being visible. The sod shall be obtained from areas where the soil is reasonably fertile. Sod of specified species shall be grown from seed or sprig with not less than 95 percent germination, 85 percent pure seed, and not more than 0.5 percent weed seed. The sod shall be machine cut to a uniform soil thickness that shall contain practically all of the dense root system and not be less than 1–inch thick.

B. Before cutting, sod shall be mowed to a height of not less that 1–1/2-inches or more than 2-inches. Sod shall be cut in minimum uniform widths of 12-inches and lengths of 24 inches.

C. Sod shall be delivered to site in a fresh, moist condition with healthy green foliage. It shall be unloaded from delivery trucks on pallets or in rolls and placed in final position within 24 hours of delivery. Sod shall be protected from wind and sun and shall not be allowed to dry out before planting.

D. Sod shall be strong enough to support its own weight and retain its size and shape when suspended vertically from a firm grasp on the upper 10 percent of the section.

E. Where sod has been removed or damaged, the sod shall be replaced with like materials. Assume all areas of the project require sod replacement. Sod shall also be placed in areas where existing landscape beds have been removed within the road rights-of-way. Sod shall be densely rooted, good quality grass, free from noxious weeds. The sod shall be obtained from areas where the soil is reasonably fertile. The sod shall be raked free of all debris and the grass mowed to two inches before cutting. The sod shall contain practically all of the dense root system and not be less than one inch (1") thick. Sod shall be cut in uniform strips not less than twelve inches (12") in width and not less than twenty-four inches (24") in length.

2.8 ACCESSORIES

A. Straw Mulch: Oat or wheat straw, reasonably free from weeds, foreign matter detrimental to plant life, and in dry condition.

B. Excelsior Mulch: Excelsior mulch shall consist of wood fibers cut from sound, green timber. The average length of fibers shall be 4 to 6 inches. Cut shall be made in such a manner as to provide maximum strength of fiber, but at a slight angle to natural grain of the wood to cause splintering of fibers when weathering in order to provide adherence to each other and to soil.

C. Wood cellulose fiber shall be made from wood chip particles manufactured particularly for discharging uniformly on the ground surface when dispersed by a hydraulic water sprayer. It shall remain in uniform suspension in water under agitation and blend with grass seed and fertilizer to form a homogenous slurry. Mulch fibers shall intertwine physically to form a strong moisture holding mat on the ground surface and allow rainfall to percolate into underlying soil. The mulch shall be heat processed to contain no germination or growth-inhibiting factors. It shall be dyed (non-toxic) an appropriate color to facilitate metering of material.

2.9 PRODUCT REVIEW

A. Contractor shall provide the Engineer with a complete description of all products before ordering. The Engineer will review all products before they are ordered.

PART 3 – EXECUTION

3.1 PREPARATION

A. Areas to be seeded shall be made smooth and uniform and shall conform to the finished grade indicated on plans.

B. Remove foreign materials, plants, roots, stones, and debris from surfaces to be seeded.

C. Grassing areas, if not loose, shall be loosened to a minimum depth of 3 inches before fertilizer, seed or sod is applied.

D. Amendments to soils shall be incorporated into loosened 3-inch top soil layer as recommended by soils tests.

E. Contractor shall provide Topsoil Analysis Tests performed by a State Agricultural Experiment Station, Soil and Water Conservation District, State University, or other qualified private testing laboratory, as acceptable to Landscape Architect/Project Engineer. Soils test shall identify existing pH and nutrient levels, as well as recommended adjustments based on the type of grass to be installed.

3.2 STAND OF GRASS

A. Before acceptance of seeding, sodding, or sprigging is performed for the establishment of permanent vegetation, Contractor will be required to produce a satisfactory stand of perennial grass whose root system shall be developed sufficiently to survive dry periods and winter weather and be capable of re-establishment in spring.

B. Before acceptance of seeding is performed for the establishment of temporary vegetation, Contractor will be required to produce a stand of grass sufficient to control erosion for a given area and length of time before the next phase of construction or establishment of permanent vegetation is to commence.

3.3 SEEDING AND SPRIGGING DATES

A. Seeding and sprigging shall be performed during periods and at rates specified in their respective schedules. Seeding and sprigging work may, at discretion of Contractor, be performed throughout the year using schedule prescribed for given period. Seeding and sprigging work shall not be conducted when the ground is frozen or excessively wet. Contractor will be required to produce a satisfactory stand of grass regardless of the period of year work is performed.

3.4 APPLYING LIME AND FERTILIZER

A. Following advance preparation and placing selected material for shoulders and slopes, lime and fertilizer, if called for based on soil tests, shall be spread uniformly over the designated areas, and shall be thoroughly mixed with the soil to a depth of approximately 2 inches. Fertilizer and lime shall be applied at the rate recommended by required soils test. Unless otherwise provided, lime will not be applied for temporary seeding. In all cases where practicable, acceptable mechanical spreaders shall be used for spreading fertilizer. On steep slopes subject to slides and inaccessible to power equipment, the slopes shall be adequately scarified. Fertilizer may be applied on steep slopes by hydraulic methods as a mixture of fertilizer and seed. When fertilizer is applied with combination seed and fertilizer drills, no further incorporation will be necessary. The fertilizer and seed shall be applied together when Wood Cellulose Fiber Mulch is used. Any stones larger than 2-1/2 inches in any dimension, larger clods, roots, or other debris brought to the surface shall be removed.

3.5 SEEDING

A. Seed shall be sown within 24 hours following application of fertilizer and lime and preparation of the seedbed as specified in Section 3.4. Seed shall be uniformly sown at rate specified by the use of acceptable mechanical seed drills. Rotary hand seeders, power sprayers or other satisfactory equipment may be used on steep slopes or on other areas inaccessible to seed drills.

B. Seeds shall be covered and lightly compacted by means of cultipacker or light roller if the drill does not perform this operation. On slopes inaccessible to compaction equipment, the seed shall be covered by dragging spiked chains, by light harrowing or by other satisfactory methods.

C. Apply water with fine spray immediately after each area has been sown.

D. Do not sow seed when ground is too dry, during windy periods or immediately following a rain.

E. If permitted by the special provisions, wood cellulose fiber mulch or excelsior fiber mulch may be used.

3.6 SEED PROTECTION (STRAW MULCH)

A. All seeded areas seeded with permanent grasses shall be uniformly mulched in a continuous blanket immediately following seeding and compacting operations, using at least 2 tons of straw per acre.

3.7 SEED PROTECTION (EXCELSIOR MULCH)

A. Seed shall be sown as specified in Section 3.5. Within 24 hours after covering of seed, excelsior mulch shall be uniformly applied at the rate of 2 tons per acre. The mulch may be applied hydraulically or by other acceptable methods. Should the mulch be placed in a dry condition, it shall be thoroughly wetted immediately after placing. Engineer may require light rolling of the mulch to form a tight mat.

3.8 SEED PROTECTION (WOOD CELLULOSE FIBER MULCH)

A. After the lime has been applied and ground prepared as specified in Section 3.4, wood cellulose fiber mulch shall be applied at a rate of 1,500 pounds per acre in a mixture of seed and fertilizer. Hydraulic equipment shall be used for application of fertilizer, seed, and slurry of the prepared wood pulp. This equipment shall have a built-in agitation system with an operating capacity sufficient to agitate, suspend, and homogeneously mix a slurry of the specified amount of fiber, fertilizer, seed, and water. The slurry distribution lines shall be large enough to prevent stoppage. The discharge line shall be equipped with a set of hydraulic spray nozzles which will provide an even distribution of slurry on various areas to be seeded. The slurry tank shall have a minimum capacity of 1,000 gallons.

Seed, fertilizer, wood pulp mulch, and water shall all be combined into the slurry tank for distribution of all ingredients in one operation by hydraulic seeding method specified herein. Materials shall be combined in a manner recommended by the manufacturer. The slurry mixture shall be regulated so amounts and rates of application shall result in a uniform application of all materials at rates not less than amount specified. Using the color of wood pulp as a guide, equipment operator

shall spray prepared seedbed with a uniform visible coat. The slurry shall be applied in a sweeping motion, in an arched stream to fall like rain, allowing wood fibers to build upon each other until an even coat is achieved.

3.9 SPRIGGING

A. Sprigs shall be placed at the date and rates as shown in section 2.6. The sprigging method shall be by broadcast sprigging, hydroplanting or row planter. Sprigging procedure shall ensure even coverage.

B. Sprigs applied by broadcast over the site with a distributor or hydroseeder shall be planted at the rates listed in section 2.6. Cover broadcast sprigs with straw mulch immediately after broadcast and water in immediately (within 2 hours).

C. Sprigs installed by row planter creating a narrow furrow that covers 50 to 80% of the sprig with soil may use less sprig material. Rate shall be as recommended by sprig supplier to provide a solid stand of turf within the time required in Section 2.6. Water in immediately (within 1 hour).

3.10 SODDING

A. Sod shall be placed between March 1st and December 1st. However, if sod is to be placed during periods of temperatures over 90 degrees F., the Contractor shall take extra care for quick placement of sod with adequate, consistent watering necessary to ensure sod thrives as planted.

B. Sod shall be placed within 24 hours of cutting.

C. Place top elevation of sod 1/2 inch below adjoining paving or curbs.

D. All areas to be sodded shall be brought to the proper line grade or cross section as was existing prior to construction. Sod shall be placed so, upon completion, edges of sodded areas will be smooth and will conform to the proposed finished grade. Sod shall be laid smooth, edge to edge, with staggered joints. Sod shall be immediately pressed firmly into contact with the sod bed by tamping or rolling, to eliminate any air pockets. A true and even surface shall be provided, to insure knitting without displacement of the sod or deformation of the sodded areas surfaces. Do not stretch or overlap sod pieces. Following compaction, screened soil of good quality shall be used to fill all cracks. Excess soil shall be worked into the grass with rakes or other suitable equipment. On slopes steeper than 3 to 1, sod shall be fastened in place with suitable wood or metal pins to hold the sod in place. Any damage by erosion or other causes occurring after completion of grading operations shall be repaired, before commencing with the sodding operations.

E. Immediately before sodding, moisten topsoil with a fine spray to a minimum 1-inch depth. Sod shall not be laid on dry or powdery soil.

F. Sod shall be moist when laid and placed on moist ground. The sod shall be carefully placed by hand, beginning at the toe of slopes and working upwards. The length of strips shall be at right angles to flow of surface water. All joints shall be tightly butted and end joints shall be staggered at least 12 inches. Sod shall be immediately pressed firmly into the ground by tamping or rolling. Fill all joints between strips with fine screened soil. Sod on slopes shall be pegged with sod

pegs to prevent movement.

G. Within two hours after sod has been placed, thoroughly water to a minimum depth of 4-inches. After sod and soil have dried, roll sodded areas to ensure good bond between sod and soil and to remove depressions and irregularities. Roll sodded areas with a roller not exceeding 150 lbs. per foot of roller width.

PART 4 – MAINTENANCE, WARRANTY AND ACCEPTANCE

4.1 MAINTENANCE

A. Maintain grassed surfaces until final acceptance.

B. Maintenance shall consist of providing protection against traffic, watering to ensure uniform seed germination and to keep surface of soil damp, and repairing any areas damaged as a result of construction operations or erosion. Maintenance shall also include, but is not limited to, watering, weeding, cultivating, removal of dead material, lawn mowing, fertilizing, and other necessary operations.

Water to prevent grass and soil from drying out. Contractor is required to water all seeded and sodded areas a minimum of 2 times a week until the grass is established. Contractor shall coordinate with IOPWSC for water supply, and shall notify IOPWSC each time water supply is obtained.

C. The Contractor shall maintain all proposed plantings until the date of substantial completion issued by the Owner.

4.2 WARRANTY

A. All grassed areas shall be guaranteed by Contractor to be alive and healthy for one-year period from date of substantial completion issued by the Owner. A final walk through with the Owner shall be conducted at end of warranty period to determine if any areas require replanting. At end of warranty period, sod shall show evidence of rooting to underlying soil and shall have no competitive weed growth from either the sod or from between sod joints.

B. Any grassed area which is dead or not showing satisfactory growth shall be replaced at Contractor's expense at the end of warranty period. All replacement shall be of original quality. Replacement required because of vandalism, excessive use, or other causes beyond the control of Contractor are not part of this contract.

4.3 ACCEPTANCE

A. Before acceptance of seeding performed for the establishment of permanent vegetation, Contractor will be required to produce a satisfactory stand of perennial grass whose root system shall be developed sufficiently to survive dry periods and winter weather and be capable of reestablishment in spring.

B. A minimum coverage of 80% density over 100% of the disturbed area is required for seeded areas before project acceptance. Sprig and sod areas shall have 95% coverage over 100% of the disturbed area prior project acceptance.

END OF SECTION

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ISLE OF PALMS STORMWATER INFRASTRUCTURE

WATERWAY BLVD PATHWAY

ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

DECEMBER 5, 2025

PREPARED FOR:

CITY OF ISLE OF PALMS

P.O. DRAWER 508

ISLE OF PALMS, SC 29451

J-27670.0010

PREPARED BY:

THOMAS & HUTTON

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C1.0	PAVING, GRADING, & DRAINAGE SHEET INDEX
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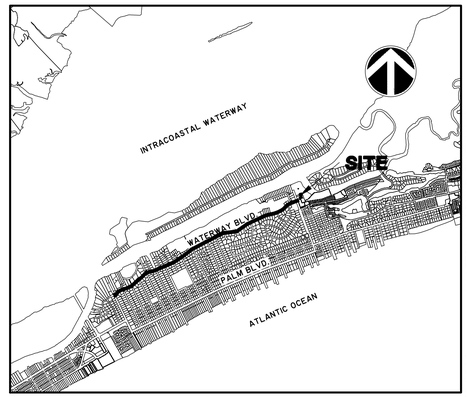

VICINITY MAP
SCALE: 1" = 3000'

WATERWAY BLVD PATHWAY

J-27670.0010
11/11/2024

ISSUED FOR CONSTRUCTION

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 18857 RICHARD PETER KARKOSKI 12/5/2025

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00285 CERTIFICATE OF AUTHORIZATION

REVISION HISTORY			
0	FOR CONSTRUCTION	MCV	10/29/25
REV. NO.	REVISION	BY	DATE

SUBMITTAL HISTORY	
FOURTH SUBMITTAL	10/29/25
THIRD SUBMITTAL	9/25/25
SECOND SUBMITTAL	8/20/25
INITIAL SUBMITTAL	2/11/25
SUBMITTED TO	DATE

811 Know what's below. Call before you dig.

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ABBREVIATIONS

DBL	DOUBLE		FM	FORCE MAIN (SANITARY SEWER)		PC	POINT OF CURVE		TC	TOP OF CURB
BOT	BOTTOM		FP	FINISH PAD		PH	POST HYDRANT		TH	THROAT ELEVATION
CB	CATCH BASIN		FR	FRAME		PT	POINT OF TANGENT		TG	TOP OF GUTTER
CI	CURB INLET		GI	GRATE INLET		PVC	POLYVINYL CHLORIDE		TP	TOP OF PAVEMENT
CO	CLEAN OUT		GV	GATE VALVE		RCP	REINFORCED CONCRETE PIPE		TW	TOP OF WALK
CPP	CORRUGATED PLASTIC PIPE		HDPE	HIGH DENSITY POLYETHYLENE		RC	ROLL CURB INLET		TYP	TYPICAL
DBL	DOUBLE		HI	HOODED INLET		RCP	REINFORCED CONCRETE PIPE		VI	VALLEY INLET
DI	DITCH INLET		INV	INVERT ELEVATION		RI	ROOF INLET		W	WATER
DIP	DUCTILE IRON PIPE		JB	JUNCTION BOX		RJP	RESTRAINED JOINT PIPE		W/	WITH
EL	ELEVATION		LF	LINEAR FEET		R/W	RIGHT-OF-WAY		WV	WATER VALVE
ES	END SECTION		MAX	MAXIMUM		SD	STORM DRAINAGE		YI	YARD INLET
FES	FLARED END SECTION		MIN	MINIMUM		SDMH	STORM DRAINAGE MANHOLE		YI	YARD INLET
FG	FINISH GRADE		MH	MANHOLE		SF	SQUARE FEET			
FH	FIRE HYDRANT		OC	ON CENTER		SS	SANITARY SEWER			

OTHER UTILITIES LEGEND

DESCRIPTION	EXISTING
NATURAL GAS	UGG
TELEPHONE	OHT
UNDERGROUND TELEPHONE	UTL
ELECTRICITY	OHP
UNDERGROUND ELECTRICITY	UGP

DRAINAGE LEGEND

DESCRIPTION	EXISTING	PROPOSED
PIPE		
DITCH		
CURB INLET (CI) CATCH BASIN (CB)		
CURB INLET - RIGHT (CI) OR CATCH BASIN - RIGHT (CB)	OR	OR
CURB INLET - LEFT (CI) OR CATCH BASIN - LEFT (CB)	OR	OR
CURB INLET - BOTH (CI) OR CATCH BASIN - LEFT (CB)	OR	OR
CONTROL STRUCTURE (CS)		
DITCH INLET (DI)		
GRATE INLET (GI)		
HOODED INLET (HI)	OR	OR
JUNCTION BOX (JB)		
MANHOLE (SDMH)		
ROLL CURB INLET (RC)		
ROOF INLET (RI)		
YARD INLET (YI)		
FLARED END SECTION (FES)		

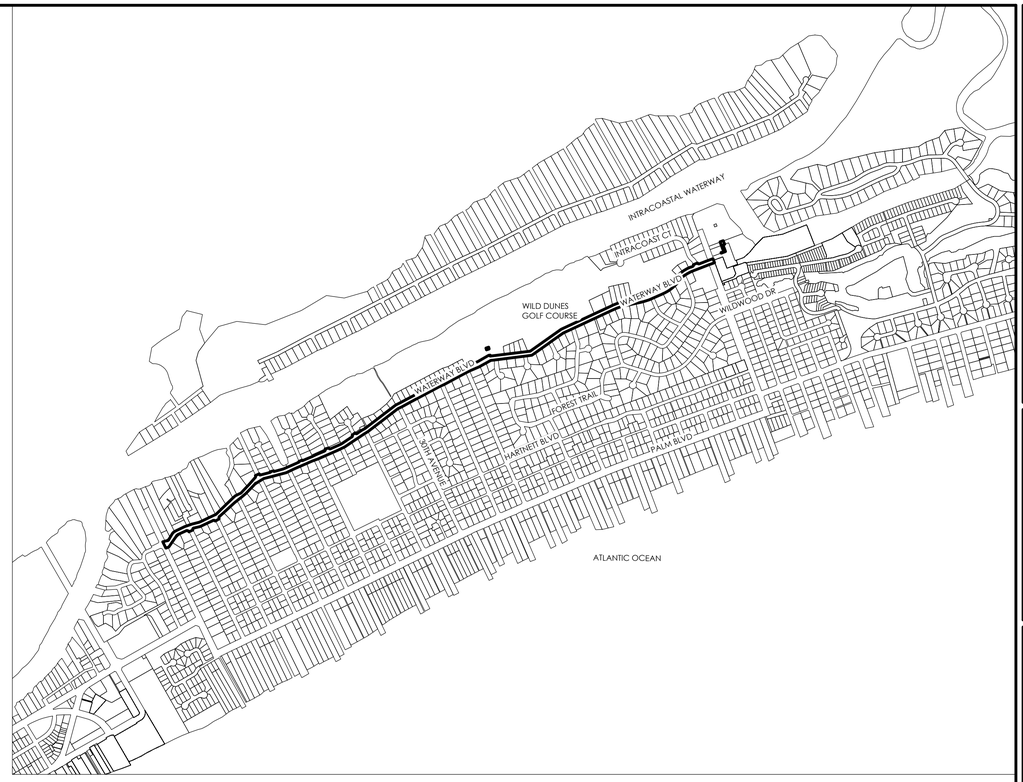
WATER LEGEND

DESCRIPTION	EXISTING	PROPOSED
WATER MAIN	10"W	10"W
SINGLE SERVICE LATERAL		
DOUBLE SERVICE LATERAL		
VALVE AND BOX		
FIRE HYDRANT W/VALVE & BOX		
POST HYDRANT		
REDUCER		
BACKFLOW PREVENTOR		
CROSS		
TEE		
90° BEND - HORIZONTAL		
45° BEND - HORIZONTAL		
22-½° BEND - HORIZONTAL		
11-¼° BEND - HORIZONTAL		
BEND - VERTICAL		
CAP		

SEWER LEGEND

DESCRIPTION	EXISTING	PROPOSED
GRAVITY PIPE	SS	
SINGLE SERVICE LATERAL		
DOUBLE SERVICE LATERAL		
MANHOLE		
CLEANOUT		
FORCEMAIN	10"FM	10"FM
VALVE AND BOX		
FLUSH HYDRANT		
REDUCER		
BACKFLOW PREVENTOR		
CROSS		
TEE		
90° BEND - HORIZONTAL		
45° BEND - HORIZONTAL		
22-½° BEND - HORIZONTAL		
11-¼° BEND - HORIZONTAL		
BEND - VERTICAL		
PLUG \ CAP		

1. CONTRACTOR SHALL COORDINATE TIE-IN OF NEW WATER AND SEWER FACILITIES TO ISLE OF PALMS WATER & SEWER COMMISSION.
2. CONTRACTOR SHALL MAINTAIN MINIMUM COVER OVER THE WATER MAIN PIPE BARREL OF 3'-0" UNLESS OTHERWISE INDICATED. TOP OF PIPE ELEVATIONS ARE SHOWN FOR CASES WHERE FUTURE STORM SEWERS ARE TO BE INSTALLED. IN NO CASE SHALL THE WATER MAIN BE INSTALLED AT A LOWER ELEVATION THAN THAT SHOWN.
3. SHOULD PIPE, FITTINGS, AND OTHER MATERIALS BE NEEDED IN ADDITION TO THAT SHOWN ON THE DRAWINGS BECAUSE PIPELINE WAS NOT INSTALLED TO THE ALIGNMENT AND PROFILE SHOWN, THEN THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING THOSE NECESSARY MATERIALS AND PROVIDING THE EQUIPMENT AND LABOR TO INSTALL THEM TO MEET THE DESIGN INTENT OF THE WATERMAIN AT NO ADDITIONAL COST TO THE OWNER.
4. THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER 48 HOURS IN ADVANCE OF ALL REQUIRED TESTS AND INSPECTIONS.
5. THE CONTRACTOR WILL NOTIFY THE ENGINEER IF UNSUITABLE MATERIAL IS DISCOVERED PRIOR TO BEGINNING ANY REMOVAL OPERATION.
6. ALL WATERMAINS SHALL BE POLYVINYL CHLORIDE (PVC C900) UNLESS OTHERWISE INDICATED.
7. ALL GRAVITY SEWER MAIN SHALL BE POLYVINYL CHLORIDE (PVC SDR35) UNLESS OTHERWISE INDICATED.
8. SURVEYING AND BOUNDARY INFORMATION BY THOMAS AND HUTTON.
9. ALL ELEVATIONS SHOWN ARE BASED ON NAVD88.
10. TOPOGRAPHIC SURVEY BY THOMAS AND HUTTON.
11. CONTRACTOR IS TO VERIFY ACCURACY OF ANY TEMPORARY BENCHMARKS SHOWN PRIOR TO UTILIZING THEM FOR CONSTRUCTION.
12. THE EXISTING UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON AVAILABLE INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL UTILITIES OTHER THAN THOSE SHOWN ARE ENCOUNTERED DURING CONSTRUCTION , THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY AND TAKE STEPS TO PROTECT THE LINE(S) AND ENSURE CONTINUED SERVICE. DAMAGE CAUSED TO EXISTING UTILITIES BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR. ADDITIONALLY, THE CONTRACTOR SHALL CONFIRM THE CONNECTION POINTS OF NEW UTILITIES TO EXISTING UTILITIES PRIOR TO BEGINNING NEW CONSTRUCTION.
13. IF WORK IS SUSPENDED OR DELAYED FOR 14 DAYS, THE CONTRACTOR SHALL TEMPORARILY STABILIZE THE DISTURBED AREA AT NO ADDITIONAL COST TO THE OWNER.
14. THE CONTRACTOR SHALL INSTALL ANY BARRICADES PRIOR TO BEGINNING CONSTRUCTION
15. THE FOLLOWING NOTES ARE SPECIFIED BY THE ENGINEER AND ARE TO BE EXECUTED BY THE CONTRACTOR:
    a. ANY DAMAGE TO EXISTING PAVEMENT MUST BE REPAIRED AT CONTRACTORS EXPENSE AND TO THE SATISFACTION OF THE COUNTY ENGINEER AND THE PROJECT ENGINEER.
    b. ALL RIGHT-OF-WAY AND DRAINAGE EASEMENT CONSTRUCTION SHALL MEET SCDOT STANDARD SPECIFICATIONS UNLESS SPECIFIED ELSEWHERE AND APPROVED IN WRITING BY THE COUNTY ENGINEER.
    c. ALL LOTS WITHIN THE DEVELOPMENT SHALL BE FILLED AND HAVE POSITIVE DRAINAGE TO THE APPROPRIATE EASEMENT OR RIGHT-OF-WAY AS APPROVED ON THE PLANS PRIOR TO THE ISSUANCE OF ANY BUILDING PERMITS OR FINAL ACCEPTANCE OF THE RIGHT-OF-WAYS BY THE COUNTY
    d. WHERE FIELD INSPECTIONS ARE REQUIRED BY THE COUNTY, THE CONTRACTOR SHALL NOTIFY THE ENGINEERING DIVISION A MINIMUM OF 48 HOURS IN ADVANCE TO SCHEDULE SUCH INSPECTIONS.
    e. A COMPLETE SET OF APPROVED DRAWINGS AND SPECIFICATIONS MUST BE MAINTAINED ON SITE AT ALL TIMES THAT THE CONTRACTOR IS PERFORMING WORK. THESE DRAWINGS SHALL BE MADE AVAILABLE UPON REQUEST.
    f. ANY REVISIONS DURING CONSTRUCTION WHICH ALTER THE ROAD LAYOUT, CONSTRUCTION METHODS, RIGHT-OF-WAY LOCATION OR DRAINAGE MUST BE SUBMITTED AND APPROVED IN WRITING BY THE COUNTY ENGINEER.
    g. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL CONSTRUCTION PERMITS NECESSARY FROM OTHER RESPONSIBLE AGENCIES.
    h. ALL TREES SHOWING DISTURBANCE WITHIN THE PROTECTED ROOT ZONE SHALL BE PRUNED AND FERTILIZED BY A CERTIFIED ARBORIST PRIOR TO RECEIVING FINAL APPROVAL.
    i. LAKE CONTOURS SHOWN HEREIN WILL PROVIDE A DEPTH ONE FOOT GREATER THAN NECESSARY FOR STORM WATER MANAGEMENT. THIS IS TO PROVIDE FOR ONE FOOT OF SILT BUILDUP DURING CONSTRUCTION OF ANY AREA OF ANY POND WHICH SILTS MORE THAN ONE FOOT ABOVE DESIGNED BOTTOM ELEVATION SHALL BE RESTORED TO THE MINIMUM ACCEPTABLE DEPTH OF ONE FOOT LESS THAN ORIGINAL CONSTRUCTED DEPTH.
    j. ALL ABOVE GROUND UTILITIES ARE TO BE OUTSIDE OF THE R/W AND ALL AT GRADE UTILITIES ARE TO BE OUT OF THE CURB LINE.
16. THE CONTRACTOR SHALL INSTALL ALL EROSION CONTROL AND PREVENTION STRUCTURES SHOWN ON THE PLANS. BOTH MUST BE APPROVED BY ENGINEER PRIOR TO BEGINNING ANY LAND DISTURBING ACTIVITIES.
17. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF UNSUITABLE MATERIAL IS DISCOVERED PRIOR TO BEGINNING ANY REMOVAL OPERATION.
18. CONTRACTOR WILL BE REQUIRED TO ADJUST MANHOLE FRAMES TO MATCH FINAL GRADE AT NO ADDITIONAL COST.
19. THE FOLLOWING NOTES ARE SPECIFIED BY THE SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL - OFFICE OF OCEAN AND COASTAL RESOURCES MANAGEMENT (SCDHEC-OCRM) AND ARE TO BE EXECUTED BY THE CONTRACTOR:
    a. ALL SEDIMENT CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND AFTER ANY STORM EVENT OF GREATER THAN 0.5 INCHES OF PRECIPITATION DURING ANY 24-HOUR PERIOD. ALL SEDIMENT CONTROL FEATURES SHALL BE MAINTAINED UNTIL FINAL STABILIZATION HAS BEEN OBTAINED.
    b. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED, UNLESS ACTIVITY IN THAT PORTION OF THE SITE WILL RESUME WITHIN 14 DAYS.
    c. RESIDENTIAL SUBDIVISIONS REQUIRE EROSION CONTROL FEATURES FOR INFRASTRUCTURE AS WELL AS FOR INDIVIDUAL LOT CONSTRUCTION. INDIVIDUAL PROPERTY OWNERS SHALL FOLLOW THESE PLANS DURING LOT CONSTRUCTION OR PROVIDE AN INDIVIDUAL PLAN MEETING SECTION R.72-307 OF THE STORM WATER MANAGEMENT AND SEDIMENT REDUCTION ACT REQUIREMENTS.
20. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE CONSTRUCTED SIMULTANEOUSLY WITH THE DISTURBANCE OF THE LAND AND SHALL REMAIN FUNCTIONAL UNTIL THE CONTRIBUTING DISTURBED AREAS ARE STABILIZED. SILT BARRIERS WILL BE INSTALLED AS NECESSARY TO PREVENT EXCESSIVE SEDIMENTATION OF DOWNSTREAM AREAS. DEVICES SHALL BE IN ACCORDANCE WITH THE MANUAL OF "EROSION AND SEDIMENT CONTROL PRACTICES FOR DEVELOPING AREAS" BY THE S.C. LAND RESOURCES CONSERVATION COMMISSION.
21. CONTRACTOR SHALL GRADE AREAS TO DRAIN FOR POSITIVE FLOW PRIOR TO FINAL APPROVAL.
22. ALL TRAFFIC CONTROL SIGNS AND PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE MANUAL ON "UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AND "SOUTH CAROLINA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" BOTH CURRENT EDITIONS.
23. ALL AREAS DISTURBED WILL BE GRASSED IMMEDIATELY AFTER THE INSTALLATION. GRASSING SHALL BE IN ACCORDANCE WITH SECTION 810 OF THE SCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION CURRENT EDITION.
24. ALL DRAINAGE WILL BE MADE FUNCTIONAL DAILY AS WORK PROGRESSES.
25. EACH EXISTING ROAD WILL BE CLEANED UP AND RESTORED DAILY.
26. NEW PAVEMENT TO BE FLUSH WITH EDGE OF EXISTING PAVEMENT.
27. ALL STORM DRAIN PIPE INVERTS IN AND OUT ARE THE SAME AS THE BOX INVERT UNLESS OTHERWISE NOTED ON THE PLAN SHEETS AND/OR PROFILES.
28. ALL SEWER PIPE AND APPURTENANCES (EG VALVES) SHALL BE IN ACCORDANCE WITH ISLE OF PALMS WATER & SEWER COMMISSION (IOPWSC) STANDARDS.
29. ALL WATER MAINS AND APPURTENANCES (EG VALVES) SHALL BE IN ACCORDANCE WITH ISLE OF PALMS WATER & SEWER COMMISSION (IOPWSC) STANDARDS.
30. ONLY TYPE S AND M MORTAR IS TO BE USED IN STORMWATER SYSTEM CONSTRUCTION AND ALL BRICKWORK AND BRICK MUST MEET SCDOT SPECIFICATIONS.
31. THE DESIGN OF THE PAVEMENT AND EARTHWORK MATERIALS, PROCEDURES AND METHODS SPECIFIED ARE BASED ON THE CRITERIA AND RECOMMENDATIONS ESTABLISHED IN THE GEOTECHNICAL INVESTIGATION REPORT PREPARED BY TERRACON CONSULTANTS, INC. , DATED MARCH 3, 2020, TERRACON PROJECT NO. EN195131 AND SUBSEQUENT ADDENDUMS.
32. ALL ELEVATIONS FOR THIS PROJECT ARE BASED ON NAVD88. COORDINATES FOR THIS PROJECT ARE BASED ON THE SOUTH CAROLINA STATE PLANE COORDINATE SYSTEM, NAD83 (2011).



INDEX

SCALE: 1" = 1000'

GENERAL NOTES

GENERAL INFORMATION

COUNTY	CHARLESTON
TOWN	CITY OF ISLE OF PALMS
ZONING	RESIDENTIAL

OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451
843-886-9912

ENGINEER:
THOMAS & HUTTON
682 JOHNNIE DODDS BLVD.
MT. PLEASANT, SC 29464
(843) 849-0200

SURVEYOR:
THOMAS & HUTTON
682 JOHNNIE DODDS BLVD.
MT. PLEASANT, SC 29464
(843) 849-0200

WATER/SEWER
ISLE OF PALMS WATER & SEWER COMMISSION
P.O. BOX 528
1300 PALMS BLVD.
ISLE OF PALMS, SC 29451
843-886-6148

GAS SERVICE
DOMINION ENERGY
4481 LEEDS PLACE WEST
NORTH CHARLESTON, SC 29405
PHONE - 843-576-8932

ELECTRIC SERVICE
DOMINION ENERGY
1277 CHUCK DAWLEY BLVD
MOUNT PLEASANT, SC 29464
PHONE - 843-576-8726

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 11/12/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

THOMAS & HUTTON

www.thomasandhutton.com

GENERAL NOTES

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

1000 0 500 1000
GRAPHIC SCALE:
1 INCH = 1000 FEET

DATUM: HORIZ.: VERT.:

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DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
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MATCH LINE THIS SHEET

MATCH LINE + SEE SHEET NO. D1.2

2IST AVE (SC 259) 80' R/W

22ND AVE (SC 260) 60' R/W

23RD AVE (SC 261) 60' R/W

WATERWAY BLVD 60' R/W

WHISPERING PALMS LN 50' R/W

8 WHISPERING PALM LN

2100 WATERWAY BLVD.

2101 WATERWAY BLVD.

2102 WATERWAY BLVD.

2103 WATERWAY BLVD.

2104 WATERWAY BLVD.

2200 WATERWAY BLVD.

2201 WATERWAY BLVD.

2202 WATERWAY BLVD.

2203 WATERWAY BLVD.

2204 WATERWAY BLVD.

2205 WATERWAY BLVD.

2300 WATERWAY BLVD.

2301 WATERWAY BLVD.

2302 WATERWAY BLVD.

2303 WATERWAY BLVD.

REMOVE EXISTING ASPHALT PATH

REMOVE AND REPLACE EXST. CONCRETE DRIVE

REMOVE AND REPLACE EXST. ASPHALT DRIVE

PATCH ROADWAY AS NEEDED FOR INLET INSTALLATION

PATH ROADWAY AS NEEDED FOR INLET INSTALLATION

REMOVE 80 LF OF WATER MAIN

MILL/REPLACE SURFACE COURSE PAVEMENT TO LIMITS SHOWN. CONTRACTOR SHALL REPLACE FULL DEPTH OF PAVEMENT WITHIN ALL TRENCH LIMITS.

PAVEMENT MARKINGS TO BE REPLACED PER SCDOT DETAILS.

PRES. 40' R/W (FILE 10.340)

PRES. 30' R/W (FILE 10.340) (P.B. J, PG. 82)

PRES. 30' R/W (FILE 10.340) (P.B. 6, PG. 13)

PRES. 30' R/W (P.B. 55, PG. 43)

PRES. 25' R/W (P.B. 55, PG. 243)

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARON 12/5/2025

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

THOMAS & HUTTON

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

DEMOLITION PLAN

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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GRAPHIC SCALE:
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SCALE:	SEE SCALE BAR

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SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARDOS 12/5/2024

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION THOMAS & HUTTON ENGINEERING CO. No. C00265

THOMAS & HUTTON

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Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

DEMOLITION PLAN

WATERWAY BLVD PATHWAY

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ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

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ISLE OF PALMS, SC 29451

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MATCH LINE - SEE SHEET NO. D1.2

MATCH LINE - SEE SHEET NO. D1.4

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MATCH LINE THIS SHEET

WATERWAY BLVD
60' R/W

DRIFTWOOD LANE
30' R/W

SEAHORSE COURT
50' R/W

ENSIGN COURT
50' R/W

26TH AVE
(SC 595) 60' R/W

27TH AVE
(SC 596) 60' R/W

28TH AVE
60' R/W

1 DRIFTWOOD LN

2 DRIFTWOOD LN

1 SEAHORSE COURT

2 SEAHORSE CT

1 ENSIGN CT

2600 WATERWAY BLVD.

2602 WATERWAY BLVD.

2604 WATERWAY BLVD.

2700 WATERWAY BLVD

2702 WATERWAY BLVD

2704 WATERWAY BLVD

2800 WATERWAY BLVD

2802 WATERWAY BLVD

PRES. 30' R/W (FILE 10.545) (P.B. 88, PG. 20)

PRES. 30' R/W (FILE 10.545) (P.B. S, PG. 69)

PRES. 30' R/W (FILE 10.545) (P.B. U, PG. 72)

PRES. 30' R/W (FILE 10.545) (P.B. T, PG. 97)

PRES. 25' R/W (P.B. 141, PG. 132)

PRES. 25' R/W (P.B. 124, PG. 122)

REMOVE EXISTING ASPHALT PATH

REMOVE/REPLACE EXST. CONCRETE CURB AND GUTTER

TMS# 571-05-00-160
DAVID R SYKES IRREVOCABLE TRUST

TMS# 571-05-00-171
MARGARET PATER 2013 TRUST &
ORAZIO PATER 2013 TRUST

TMS# 571-05-00-213
CHRISTOPHER C. & SHARYN L. NICHOLS

TMS# 571-05-00-197
CITY OF I.O.P. COMM.
OF PUBLIC WORKS

TMS# 571-05-00-198
BRUCE D & DORIS A. LINDSEY

TMS# 571-05-00-196
ANTOINE MAKHLOUTA &
KATHLEEN ELLEN ASHTON

SSMH
FR: 6.83
BOX: 0.21

SSMH
FR: 6.57
BOX: 0.58

SSMH
FR: 6.82
BOX: (-)

SSMH
FR: 7.28
BOX: (-)

SD MANHOLE
FR: 6.32
BOX: 1.08
IE RCP (N): 1.08
IE RCP (S): 1.12
IE 18"RCP (E): 2.48
IE 18"RCP (W): 2.20

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 18837
RICHARD PETER KARG
12/5/2024

SOUTH CAROLINA
THOMAS & HUTTON ENGINEERING CO.
No. C00265
CERTIFICATE OF AUTHORIZATION

THOMAS & HUTTON

682 Johnnie Dodds Blvd. • Suite 100
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www.thomasandhutton.com

DEMOLITION PLAN

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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MATCH LINE - SEE SHEET NO. D1.3

MATCH LINE THIS SHEET

MATCH LINE THIS SHEET

MATCH LINE - SEE SHEET NO. D1.5

WATERWAY BLVD
60' R/W

29TH AVE
60' R/W

30TH AVE
(SC 918) 60' R/W

2 ENSIGN CT

2804 WATERWAY BLVD

2900 WATERWAY BLVD

2902 WATERWAY BLVD

2903 WATERWAY BLVD

2904 WATERWAY BLVD

2905 WATERWAY BLVD

2906 WATERWAY BLVD

2907 WATERWAY BLVD

2908 WATERWAY BLVD

2911 WATERWAY BLVD

3000 WATERWAY BLVD

3001 WATERWAY BLVD

3002 WATERWAY BLVD

3003 WATERWAY BLVD

3004 WATERWAY BLVD

3005 WATERWAY BLVD

3007 WATERWAY BLVD

3009 WATERWAY BLVD

3011 WATER

REMOVE AND REPLACE EXST. ASPHALT DRIVE

REMOVE AND REPLACE EXST. CONCRETE DRIVE

REMOVE AND REPLACE EXST. ASPHALT/CONCRETE DRIVE

REMOVE EXISTING ASPHALT PATH

CUT AND CAP IRRIGATION SYSTEM AT RIGHT-OF-WAY

REMOVE AND RELOCATE MAILBOX TO FINISHED GRADE

REMOVE AND RELOCATE MAILBOX TO FINISHED GRADE AND OUTSIDE OF PATHWAY

PRES. 30' R/W (FILE 10.545) (P.B. BB, PG. 20)

PRES. 30' R/W (FILE 10.545) (P.B. T, PG. 97)

PRES. 30' R/W (FILE 10.545) (P.B. S, PG. 107)

PRES. 30' R/W (FILE 10.545) (P.B. X, PG. 109)

PRES. 30' R/W (FILE 10.469) (P.B. BB, PG. 20)

PRES. 30' R/W (FILE 10.469) (P.B. X, PG. 13)

PRES. 30' R/W (FILE 10.469) (P.B. X, PG. 109)

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

THOMAS & HUTTON

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

DEMOLITION PLAN

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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D1.4

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MATCH LINE - SEE SHEET NO. D1.4

MATCH LINE THIS SHEET

MATCH LINE - SEE SHEET NO. D1.6

MATCH LINE THIS SHEET

WATERWAY BLVD
60' R/W

31ST AVE
(SC 2671) 60' R/W

32ND AVE
(SC 3937) 60' R/W

REMOVE AND RELOCATE MAILBOX TO FINISHED GRADE AND OUTSIDE OF PATHWAY

REMOVE EXISTING ASPHALT PATH

REMOVE AND REPLACE EXST. CONCRETE DRIVE

REMOVE AND REPLACE EXST. ASPHALT DRIVE

REMOVE AND REPLACE EXST. PAVERS DRIVE

REMOVE AND REPLACE EXST. CONCRETE DRIVE. PROTECT EXST. INLET.

REMOVE AND REPLACE EXST. BRICK PAVER DRIVE

REMOVE AND REPLACE EXST. CONCRETE DRIVE

MILL/REPLACE SURFACE COURSE PAVEMENT TO LIMITS SHOWN. CONTRACTOR SHALL REPLACE FULL DEPTH OF PAVEMENT WITHIN ALL TRENCH LIMITS.

PAVEMENT MARKINGS TO BE REPLACED PER SCDOT DETAILS.

REMOVE 29 LF OF 12" WATER MAIN

REMOVE 28 LF OF 12" WATER MAIN

REMOVE 22 LF OF 8" WATER MAIN

REMOVE AND REPLACE WATER SERVICE

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARON 12/5/2025

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

THOMAS & HUTTON

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

DEMOLITION PLAN

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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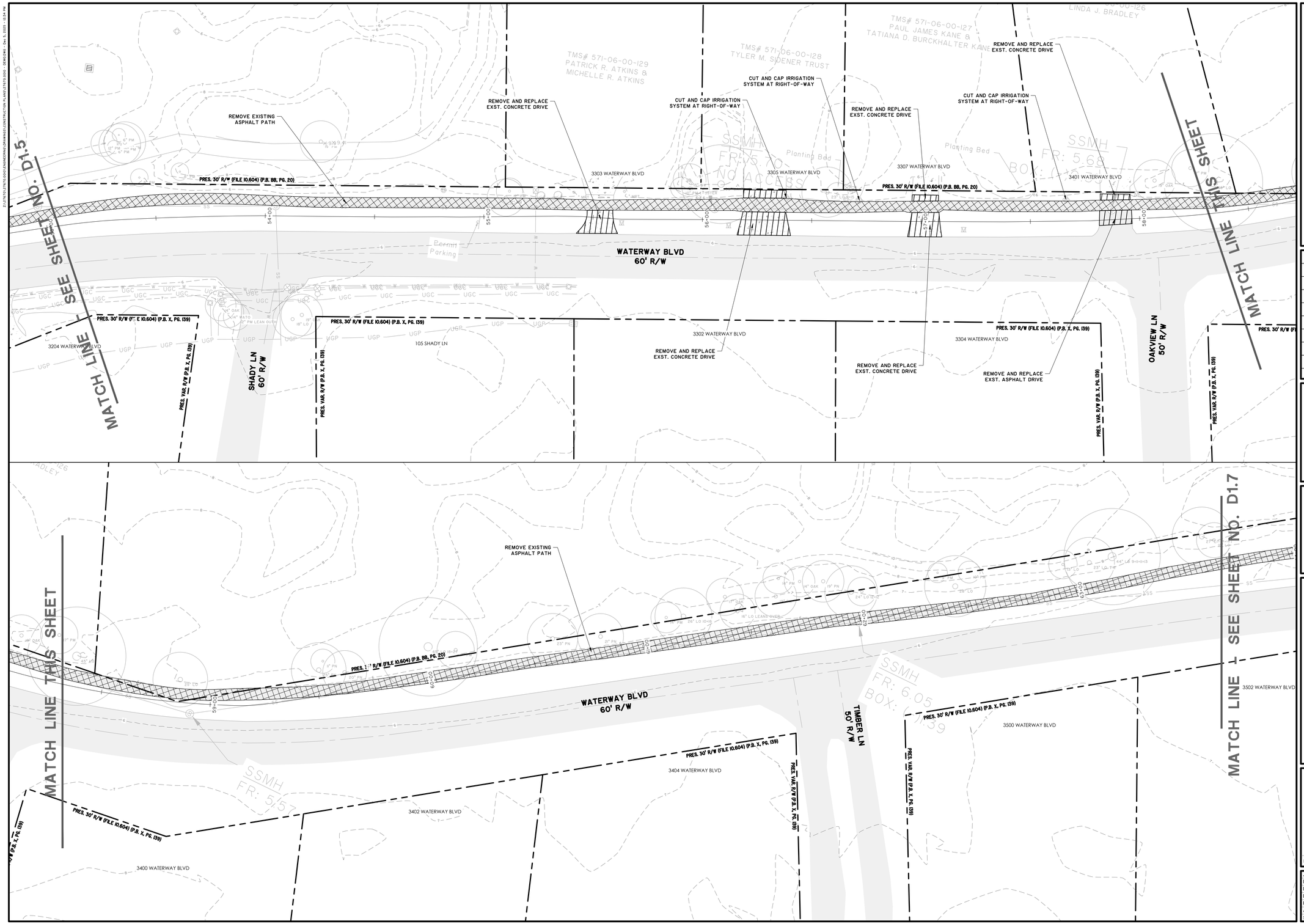

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARON 12/5/2024

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION THOMAS & HUTTON ENGINEERING CO. No. C00265

THOMAS & HUTTON

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

DEMOLITION PLAN

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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MATCH LINE - SEE SHEET NO. D1.6

MATCH LINE THIS SHEET

REMOVE EXISTING ASPHALT PATH

PRES. 30' R/W (FILE 10.604) (P.B. BB, PG. 20)

WATERWAY BLVD
60' R/W

Permit Parking

FOREST TRAIL
50' R/W

PRES. 30' R/W (FILE 10.604) (P.B. X, PG. 139)

PRES. VAR. R/W (P.B. X, PG. 139)

3502 WATERWAY BLVD

3504 WATERWAY BLVD

3600 WATERWAY BLVD

3602 WATERWAY BLVD

TMS# 571-00-00-001
WILD DUNES LLC
HARBOR GOLF COURSE

TMS# 571-07-00-022
PAT R. ROSS & THOMAS J. C

TMS# 571-07-00-162
JOHN M. AND
LYNN Z. GARLAND

TMS# 571-07-
BRIAN J. DUFFY, RE
CATHERINE L. MALLORY

MATCH LINE - SEE SHEET NO. D1.8

MATCH LINE THIS SHEET

REMOVE AND REPLACE EXST. CONCRETE DRIVE

REMOVE EXISTING ASPHALT PATH

REMOVE AND RELOCATE MAILBOX TO FINISHED GRADE

REMOVE AND RELOCATE MAILBOX TO FINISHED GRADE AND OUTSIDE OF PATHWAY

PRES. 30' R/W (FILE 10.604) (P.B. BB, PG. 20)

WATERWAY BLVD
60' R/W

REMOVE AND REPLACE EXST. ASPHALT DRIVE

PRES. 30' R/W (FILE 10.604) (P.B. AB, PG. 22)

REMOVE AND REPLACE 614 SY ASPHALT

REMOVE AND REPLACE EXST. CONCRETE DRIVE

REMOVE AND REPLACE EXST. CONCRETE DRIVE

PAVEMENT MARKINGS TO BE REPLACED PER SCDOT DETAILS.

3604 WATERWAY BLVD

3605 WATERWAY BLVD

3606 WATERWAY BLVD

3607 WATERWAY BLVD

3608 WATERWAY BLVD

3609 WATERWAY BLVD

3610 WATERWAY BLVD

3611 WATERWAY BLVD

3612 WATERWAY BLVD

3613 WATERWAY BLVD

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER
No. 18837
RICHARD PETER KARDOS
12/5/2025

SOUTH CAROLINA
THOMAS & HUTTON ENGINEERING CO.
No. C00265
CERTIFICATE OF AUTHORIZATION

THOMAS & HUTTON

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

DEMOLITION PLAN

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

20 0 10 20
GRAPHIC SCALE:
1 INCH = 20 FEET

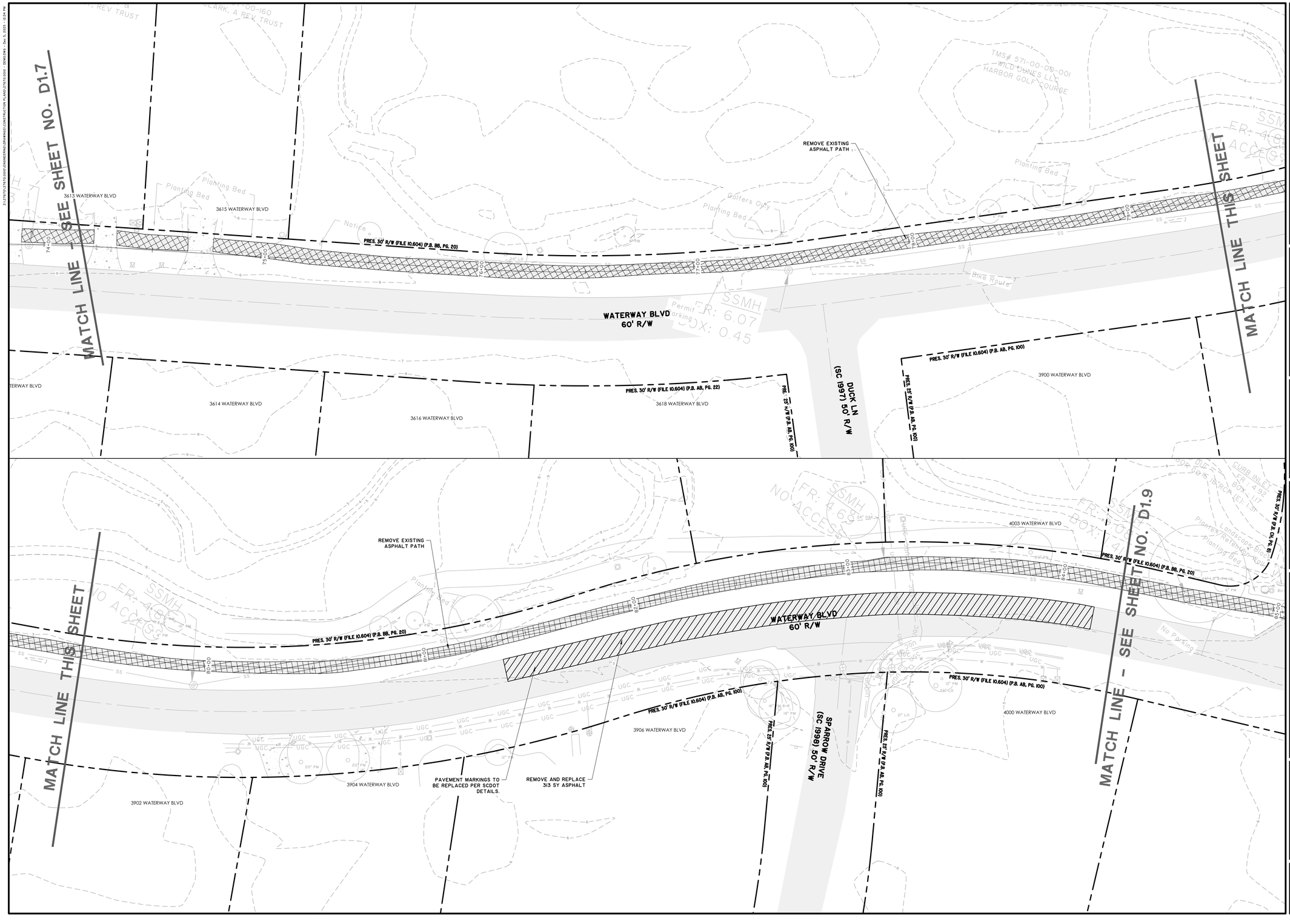
20 0 10 20
GRAPHIC SCALE:
1 INCH = 20 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/17/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

D1.7

Z:\27670.0010\ENGINEERING\DRAWINGS\CONSTRUCTION PLANS\27670.0010 - DEMO.DWG - Dec 5, 2025 - 10:34 AM



NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2025

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION THOMAS & HUTTON ENGINEERING CO. No. C00265

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APPROVED:	RPK
SCALE:	SEE SCALE BAR

D1.8

Z:\27670.0010\ENGINEERING\DRAWINGS\CONSTRUCTION PLANS\27670.0010 - DEMO.DWG - Dec 5, 2023 - 10:34 AM

MATCH LINE - SEE SHEET NO. D1.2

INTRACOASTAL COURT
60' R/W

WATERWAY BLVD
60' R/W

41ST AVE
(SC 914) 80' R/W

MATCH LINE THIS SHEET

MATCH LINE THIS SHEET

REMOVE EXISTING ASPHALT PATH

REMOVE/REPLACE EXST. CONCRETE CURB AND GUTTER

REMOVE AND REPLACE GRAVEL DRIVEWAY

PRES. 30' R/W (FILE 10.604) (P.B. BB, PG. 20)

PRES. 30' R/W (FILE 10.604) (P.B. AB, PG. 100)

PRES. 40' R/W (FILE 10.604) (P.B. AH, PG. 100)

PRES. 30' R/W (P.B. CH, PG. 8)

PRES. 40' R/W (FILE 10.604) (P.B. AB, PG. 100)

4003 WATERWAY BLVD

4000 WATERWAY BLVD

2 INTRACOASTAL CT

TMS# 571-07-00-159
JOHN S. & DONNA G. BRENNER

TMS# 571-08-00-019
CITY OF ISLE OF PALMS

TMS# 571-08-00-226
WILD DUNES LLC

TMS# 571-07-00-XXX
ISLE OF PALMS WATER AND SEWER COMMISSION

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 18837
RICHARD PETER KARON
12/5/2024

SOUTH CAROLINA
THOMAS & HUTTON ENGINEERING CO.
No. C00265
CERTIFICATE OF AUTHORIZATION

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DEMOLITION PLAN

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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JOB NO:	27670.0010
DATE:	11/17/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

D1.9

STORMWATER POLLUTION PREVENTION PLAN

I. SITE DESCRIPTION

A. PROJECT DESCRIPTION

A.1.	PROJECT AREA	12.6 ACRES
A.2.	AREA DISTURBED	12.6 ACRES
A.3.	PERCENT IMPERVIOUS AREA BEFORE CONSTRUCTION	38 %
A.4.	RUNOFF COEFFICIENT BEFORE CONSTRUCTION	61 CN
A.5.	PERCENT IMPERVIOUS AREA AFTER CONSTRUCTION	37 %
A.6.	RUNOFF COEFFICIENT AFTER CONSTRUCTION	61
A.7.	CN	

B. DESCRIPTION OF CONSTRUCTION ACTIVITY

WORK CONSISTS OF ##

C. RUNOFF DATA

C.1.	SOIL CLASSIFICATIONS:	(HSG) A
C.2.	LAND USE(S):	RESIDENTIAL

D. RECEIVING WATERS

D.1.	CLOSEST RECEIVING WATERS:	INTRACOASTAL WATERWAY
D.2.	ULTIMATE RECEIVING WATERS:	ATLANTIC OCEAN

E. FLOOD

E.1.	FEMA FLOOD ZONE(S):	ZONE AE ELEV. 10 & AE ELEV. 11
E.2.	FEMA FLOOD INSURANCE MAP(S):	45019C0541K EFF. 1/29/2021 AND 45019C0542K EFF. 1/29/2021

II. CONTROL MEASURES

1. EROSION and SEDIMENT CONTROLS

PRIOR TO START OF CONSTRUCTION, ALL EXTERIOR SILT FENCE WILL BE INSTALLED AS SHOWN ON THE PLANS.

1.1. CLEARING

1.1.1. AS CLEARING IS COMPLETED, ADDITIONAL SILT FENCE WILL BE INSTALLED WHERE NECESSARY, SUCH AS POINTS WHERE FLOWS BECOME CHANNELIZED, AND OTHER POINTS WHERE EXCESSIVE RUNOFF VELOCITIES MAY OCCUR.
1.1.2. INSTALL CONSTRUCTION ENTRANCES / EXITS BEFORE BEGINNING CLEARING
1.1.3. CONSTRUCTION DELAYS IN ANY ONE AREA GREATER THAN 14 DAYS PRIOR TO START OF ROUGH GRADING WILL MANDATE STABILIZATION PROCEDURES. ACCEPTABLE METHODS OF STABILIZATION INCLUDE MULCHING AND TEMPORARY SEEDING.
1.1.4. MAINTAIN EXISTING VEGETATION WHENEVER POSSIBLE AND MINIMIZE THE AREA OF DISTURBANCE. RETAIN AND PROTECT TREES TO ENHANCE FUTURE LANDSCAPING EFFORTS AND REDUCE RAINDROP IMPACT.
1.1.5. INSTALL ALL SEDIMENT CONTROL PRACTICES PRIOR TO ANY UP-SLOPE SOIL DISTURBING ACTIVITIES.
1.1.6. PHASE CONSTRUCTION ACTIVITIES TO MINIMIZE THE AREAS DISTURBED AT ONE TIME. THIS WILL ALSO ALLOW COMPLETED AREAS TO BE STABILIZED AND RE-VEGETATED BEFORE DISTURBING ADJACENT SITES. THE NEED FOR TEMPORARY EROSION CONTROL MEASURES MAY BE AVOIDED BY COMPLETING A PHASE AND INSTALLING PERMANENT EROSION CONTROL MEASURES WHEN THE FINAL GRADE IS ATTAINED.
1.1.7. MAINTAIN AND PROTECT ALL NATURAL WATERWAYS. RETAIN AT LEAST A 35-FOOT UNDISTURBED BUFFER OF NATURAL VEGETATION ALONG ALL WATERWAYS TO FILTER OUT SEDIMENT AND OTHER POLLUTANTS. MAINTAIN A 45-FOOT UNDISTURBED BUFFER AROUND SENSITIVE WATERS.
1.1.8. INSTALL SILT FENCE (OR BIO ROLLS/ROCK SOCK PRODUCTS) ON THE DOWN-SLOPE PERIMETER OF ALL DISTURBED AREAS PRIOR TO ANY SOIL DISTURBING ACTIVITIES (INCLUDING CLEARING AND GRUBBING). SILT FENCE CAN TREAT A MAXIMUM OF 100 SQUARE FEET PER LINEAL FOOT OF FENCE. INSTALL SILT FENCE IN SHORTER REACHES ON THE CONTOUR WITH EACH END TURNED UP-SLOPE . SWALES AND SHORELAND AREAS SHOULD ALSO BE PROTECTED WITH SILT FENCE, BIO ROLLS, OR ROCK SOCKS.
1.1.9. IN AREAS OF CONCENTRATED FLOW INSTALL STRAW BALE CHECKS, ROCK CHECK DAMS, TRIANGULAR DIKES, BIO ROLL BLANKETS, OR ROCK SOCKS TO SLOW RUNOFF AND TRAP SEDIMENT.
1.1.10. USE TEMPORARY SLOPE DRAINS OR ROCK CHUTES TO MOVE WATER DOWN STEEP SLOPES.
1.1.11. CONSTRUCT SEDIMENT BASINS FOR DRAINAGE AREAS GREATER THAN 10 ACRES

1.2. ROUGH GRADING

1.2.1. ALL EXISTING CONTROLS WILL BE MAINTAINED DURING ROUGH GRADING, DELAYS OF GREATER THAN 14 DAYS PRIOR TO START OF NEXT ACTIVITY WILL MANDATE STABILIZATION PROCEDURES. ACCEPTABLE METHODS OF STABILIZATION INCLUDE MULCHING AND TEMPORARY SEEDING.
1.2.2. ALL AREAS NOT SUBJECT TO FURTHER CONSTRUCTION (DRAINAGE, SANITARY SEWER, ROADS, WATER DISTRIBUTION SYSTEMS, OR STORM WATER FACILITIES) SHALL BE GRASSED WITH A PERMANENT COVER.
1.2.3. COVER ANY STOCK PILED TOPSOIL WITH PLASTIC (OR OTHER IMPERVIOUS COVERING) OR USE A TEMPORARY SEED MIX. USE STOCKPILED TOPSOIL AS EARTHEN BERMS TO SERVE AS TEMPORARY SEDIMENT BASINS.

1.3. DRAINAGE

1.3.1. ALL EXISTING CONTROLS WILL BE MAINTAINED DURING DRAINAGE INSTALLATION.
1.3.2. CONSTRUCTION DRAINAGE WILL BE ROUTED THROUGH LAKES, WHICH WILL ACT AS SEDIMENT BASINS OR OTHER ACCEPTABLE SEDIMENT BASINS/TRAPS.
1.3.3. STORM DRAIN INLET PROTECTION AS SHOWN ON DETAIL SHEET SHALL BE INSTALLED ON ALL CURB INLETS, STORM DRAIN MANHOLES, JUNCTION BOXES, AND GRATE INLETS.
1.3.4. DELAYS OF GREATER THAN 14 DAYS PRIOR TO START OF THE NEXT CONSTRUCTION SEQUENCE WILL MANDATE STABILIZATION PROCEDURES. ACCEPTABLE METHODS OF STABILIZATION INCLUDE MULCHING AND TEMPORARY SEEDING.
1.3.5. ALL STORM LINES NOT IN STREETS OR OTHER PAVED AREAS ARE TO BE MULCHED AND SEEDED WITHIN 5 DAYS AFTER BACKFILL.

1.4. WASTE DISTRIBUTION SYSTEM INSTALLATION

1.4.1. ALL EXISTING CONTROLS WILL BE MAINTAINED DURING INSTALLATION OF THE WATER DISTRIBUTION SYSTEM.
1.4.2. DELAYS OF GREATER THAN 14 DAYS PRIOR TO START OF NEXT ACTIVITY WILL MANDATE STABILIZATION PROCEDURES. ACCEPTABLE METHODS OF STABILIZATION INCLUDE MULCHING AND TEMPORARY SEEDING.

1.5. WASTEWATER COLLECTION SYSTEM INSTALLATION

1.5.1. ALL EXISTING CONTROLS WILL BE MAINTAINED DURING INSTALLATION OF THE WASTEWATER SYSTEM.
1.5.2. DELAYS OF GREATER THAN 14 DAYS PRIOR TO START OF NEXT ACTIVITY WILL MANDATE STABILIZATION PROCEDURES. ACCEPTABLE METHODS OF STABILIZATION INCLUDE MULCHING AND TEMPORARY SEEDING.

1.6. CONSTRUCTION OF ROADS

1.6.1. ALL EXISTING CONTROLS WILL BE MAINTAINED DURING ROAD CONSTRUCTION.
1.6.2. DELAYS OF GREATER THAN 14 DAYS PRIOR TO START OF NEXT ACTIVITY WILL MANDATE STABILIZATION PROCEDURES. ACCEPTABLE METHODS OF STABILIZATION INCLUDE MULCHING AND TEMPORARY SEEDING.

1.7. GRASSING

1.7.1. ALL EXISTING CONTROLS WILL BE MAINTAINED UNTIL GRASSING IS ESTABLISHED
1.7.2. ANY AREAS THAT ERODE OR WHERE GRASS DOES NOT ESTABLISH ITSELF SHALL BE RE-GRADED AND RE-GRASSED.

2. STORM WATER MANAGEMENT

RUNOFF FROM THIS PROJECT WILL DISCHARGE INTO A STORM WATER MANAGEMENT SYSTEM. TREATMENT WILL OCCUR IN STORM WATER DETENTION PONDS.

3. OTHER CONTROLS

3.1. WASTE DISPOSAL

3.1.1. NO SOLID MATERIALS, INCLUDING BUILDING MATERIALS, SHALL BE DISCHARGED TO ANY RECEIVING WATERS.
3.1.2. OFFSITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST SHALL BE MINIMIZED.
3.1.3. THIS PLAN SHALL COMPLY WITH STATE AND/OR LOCAL WASTE DISPOSAL, SANITARY SEWER OR SEPTIC SYSTEM REGULATIONS.
3.1.4. DUST CONTROL ON DISTURBED AREAS - CONTROLLING SURFACE AND AIR MOVEMENT OF DUST ON CONSTRUCTION SITE AND HAUL ROUTES. THE PURPOSE OF THE MEASURE IS TO REDUCE THE PRESENCE OF AIRBORNE SUBSTANCES, WHICH MAY BE HARMFUL OR INJURIOUS TO HUMAN HEALTH, WELFARE OR SAFETY, OR TO ANIMALS OR PLANT LIFE.

III. MAINTENANCE

1. MAINTENANCE PROGRAM

1.1. THE SITE SUPERINTENDENT, OR HIS/HER REPRESENTATIVE, SHALL MAKE VISUAL INSPECTIONS OF ALL MECHANICAL CONTROLS AND NEWLY STABILIZED AREAS (I.E. SEEDED AND MULCHED AND/OR SODDED AREAS) ON A DAILY BASIS; ESPECIALLY AFTER HEAVY RAINFALL EVENT TO INSURE THAT ALL CONTROLS ARE MAINTAINED AND PROPERLY FUNCTIONING. ANY DAMAGED CONTROLS SHALL BE REPAIRED PRIOR TO THE END OF THE WORK DAY INCLUDING RE-SEEDING AND MULCHING OR RE-SODDING IF NECESSARY.

1.2. EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE. ALL DRAINAGE SWALES, POCKETS, DEPRESSION, LOW LINES, AND OUTLET DITCHES SHALL DRAIN EFFECTIVELY AT ALL TIMES. SETTLEMENT OR WASHING THAT MAY OCCUR SHALL BE REPAIRED BY THE CONTRACTOR. SEDIMENT WILL BE REMOVED FROM BEHIND THE SEDIMENT FENCE WHEN IT REACHES 1/3 THE HEIGHT OF THE FENCE. THE SEDIMENT FENCE WILL BE REPAIRED AS NECESSARY TO MAINTAIN AN EFFECTIVE BARRIER. MAINTAIN THE CONSTRUCTION EXIT IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE SITE. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE. IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED, OR TACKED ONTO PUBLIC ROADWAYS. RESEED AND MULCH AREA WHERE SEEDING EMERGENCE IS POOR, OR WHERE EROSION OCCURS. PROTECT FROM TRAFFIC AS MUCH AS POSSIBLE. INSPECT ALL MULCHES PERIODICALLY, AND AFTER RAINSTORMS TO CHECK FOR EROSION, DISLOCATION OR FAILURE. IF WASHOUT OCCURS, REPAIR THE SLOPE GRADE, RESEED AND REINSTALL MULCH. FOLLOW THE CONSTRUCTION SEQUENCE THROUGHOUT THE PROJECT DEVELOPMENT. WHEN CHANGES IN CONSTRUCTION ACTIVITIES ARE NEEDED, AMEND THE SEQUENCE SCHEDULE IN ADVANCE TO MAINTAIN MANAGEMENT CONTROL IF MAJOR CHANGES ARE NECESSARY, SEND A COPY OF THE MODIFIED SCHEDULE TO THE ENGINEER, SEDIMENT AND EROSION CONTROL MEASURES WILL REMAIN IN PLACE AND BE MAINTAINED UNTIL THE DISTURBED AREAS ARE STABILIZED.

2. SILT FENCE

SILT FENCES WILL BE MONITORED DURING CONSTRUCTION. ANY SILT FENCE WHICH IS NOT FUNCTIONING PROPERLY WILL BE PROMPTLY REPAIRED. CLEAN OUT THE SILT FENCE WHEN IT REACHES 1/3 THE HEIGHT OF THE FENCE OR REPLACE WITH FUNCTIONAL SILT FENCE WITHIN 24 HOURS. USE OF HOSES AND WATER TO FLUSH THE SEDIMENT INTO THE STORM INLETS IS UNACCEPTABLE.

3. SEDIMENTATION BASINS

SEDIMENTATION BASINS WHICH ARE AT 50% USED CAPACITY OR APPROACHING SUCH CAPACITY SHALL BE RE-EXCAVATED TO ORIGINAL DIMENSIONS AND THE SILT PROPERLY DISPOSED OF.

4. SEDIMENT LOGS/ROLLS

SEDIMENT LOGS/ROLLS OR OTHER CONTROL MEASURES WHICH BEGIN TO DISINTEGRATE OR FUNCTION INEFFECTIVELY SHALL BE PROMPTLY REPLACED.

5. VEGETATION COVER

ANY VEGETATION COVER SERVING TO STABILIZE DISTURBED SOILS WHICH IS ITSELF DISTURBED SHALL IMMEDIATELY BE REPLACED.

6. CONSTRUCTION ENTRANCE

MAINTAIN ROCK CONSTRUCTION ENTRANCE AND CLEAN ADJACENT ROADS OF ANY MUD TRACKED ONTO THEM.

IV. INSPECTIONS

1. QUALIFIED PERSONNEL WILL INSPECT DISTURBED AREAS OF THE CONSTRUCTION SITE, AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION THAT HAVE NOT BEEN FINALLY STABILIZED, STRUCTURAL CONTROL MEASURES, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE AT LEAST ONCE EVERY SEVEN CALENDAR DAYS. WHERE SITES HAVE BEEN FINALLY STABILIZED SUCH INSPECTIONS SHALL BE CONDUCTED AT LEAST ONCE EVERY MONTH DURING THE WARRANTY PERIOD.

2. DISTURBED AREAS AND AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM. EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. WHERE DISCHARGE LOCATIONS OR POINTS ARE ACCESSIBLE, THEY SHALL BE INSPECTED TO ASCERTAIN WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATERS. LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFFSITE SEDIMENT TRACKING.

3. A WRITTEN REPORT SUMMARIZING THE SCOPE OF THE INSPECTION, NAME(S) AND QUALIFICATIONS OF PERSONNEL MAKING THE INSPECTION, THE DATE(S) OF THE INSPECTION, WEATHER INFORMATION FOR THE PERIOD SINCE THE LAST INSPECTION (OR SINCE COMMENCEMENT OF CONSTRUCTION ACTIVITY) INCLUDING A BEST ESTIMATE OF THE BEGINNING OF EACH STORM EVENT, DURATION OF EACH STORM EVENT, APPROXIMATE AMOUNT OF RAINFALL FOR EACH STORM EVENT (IN INCHES) AND WHETHER ANY DISCHARGES OCCURRED, LOCATION(S) OF DISCHARGES OF SEDIMENT OR OTHER POLLUTANTS FROM THE SITE, LOCATION(S) OF BMP'S THAT NEED MAINTENANCE, LOCATION(S) OF BMP'S THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION, LOCATION(S) WHERE ADDITIONAL BMP'S ARE NEEDED THAT DID NOT EXIST AT THE TIME OF INSPECTION AND ANY CORRECTIVE ACTION REQUIRED INCLUDING ANY CHANGES TO SWPPP NECESSARY AND IMPLEMENTATION DATES.

4. THE REPORT SHALL BE MAINTAINED AT LEAST THREE YEARS FROM THE DATE THE SITE IS FINALLY STABILIZED. THE REPORT MUST BE SIGNED AND SHALL CONTAIN A CERTIFICATION THAT THE FACILITY IS IN COMPLIANCE WITH THE STORM WATER POLLUTION PREVENTION PLAN AND THE NPDES PERMIT REFERENCED ABOVE. THE CONTRACTOR SHALL MAINTAIN THIS REPORT. THE REPORT SHALL BE SUBMITTED TO THE ENGINEER AND OWNER.

V. LONG TERM MAINTENANCE OF DRAINAGE AND STORM WATER MANAGEMENT SYSTEM

THE ROADS WILL BE OWNED AND MAINTAINED BY THE SCDOT/COUNTY AND THE DRAINAGE SYSTEM WILL BE OWNED AND MAINTAINED BY THE CITY AFTER CONSTRUCTION IS COMPLETE.

VI. SC DHEC STANDARD NOTES

1. IF NECESSARY, SLOPES WHICH EXCEED EIGHT (8) VERTICAL FEET SHOULD BE STABILIZED WITH SYNTHETIC OR VEGETATIVE MATS, IN ADDITION TO GRASSING / HYDROSEEDING. IT MAY BE NECESSARY TO INSTALL TEMPORARY SLOPE DRAINS DURING CONSTRUCTION. TEMPORARY BERMS MAY BE NEEDED UNTIL THE SLOPE IS BROUGHT TO GRADE.

2. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOURTEEN (14) DAYS AFTER WORK HAS CEASED, EXCEPT AS STATED BELOW:

2.1. WHERE STABILIZATION BY THE 14TH DAY IS PRECLUDED BY SNOW COVER OR FROZEN GROUND CONDITIONS STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICABLE.
2.2. WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH-DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 14 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE.

3. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED ONCE EVERY CALENDAR WEEK. IF PERIODIC INSPECTION OR OTHER INFORMATION INDICATES THAT A BMP HAS BEEN USED INAPPROPRIATELY, OR INCORRECTLY, THE PERMITTEE MUST ADDRESS THE NECESSARY REPLACEMENT OR MODIFICATION REQUIRED TO CORRECT THE BMP WITHIN 48 HOURS OF IDENTIFICATION.

4. PROVIDE SILT FENCE AND/OR OTHER CONTROL DEVICES, AS MAY BE REQUIRED, TO CONTROL SOIL EROSION DURING UTILITY CONSTRUCTION. ALL DISTURBED AREAS SHALL BE CLEANED, GRADED AND STABILIZED WITH GRASSING IMMEDIATELY AFTER THE UTILITY INSTALLATION. FILL, COVER, AND TEMPORARY SEEDING AT THE END OF EACH DAY ARE RECOMMENDED. IF WATER IS ENCOUNTERED WHILE TRENCHING, THE WATER SHOULD BE FILTERED TO REMOVE ANY SEDIMENTS BEFORE BEING PUMPED INTO ANY WATERS OF THE STATE.

5. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFFSITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED.

6. THE CONTRACTOR MUST TAKE NECESSARY ACTION TO MINIMIZE THE TRACKING OF MUD ONTO THE PAVED ROADWAY FROM CONSTRUCTION AREAS AND THE GENERATION OF DUST. THE CONTRACTOR SHALL DAILY REMOVE MUD/SOIL FROM PAVEMENT AS MAY BE REQUIRED.

7. RESIDENTIAL SUBDIVISIONS REQUIRE EROSION CONTROL FEATURES FOR INFRASTRUCTURE AS WELL AS FOR INDIVIDUAL LOT CONSTRUCTION. INDIVIDUAL PROPERTY OWNERS SHALL FOLLOW THESE PLANS DURING CONSTRUCTION OR OBTAIN APPROVAL OF AN INDIVIDUAL PLAN IN ACCORDANCE WITH S.C. REG. 72-300 AND SCR100000.

8. TEMPORARY DIVERSION BERMS AND/OR DITCHES WILL BE PROVIDED AS NEEDED DURING CONSTRUCTION TO PROTECT WORK AREAS FROM UPSLOPE RUNOFF AND/OR TO DIVERT SEDIMENT LADEN WATER TO APPROPRIATE TRAPS OR STABLE OUTLETS.

9. ALL WATERS OF THE STATE (WOS), INCLUDING WETLANDS, ARE TO BE FLAGGED OR OTHERWISE CLEARLY MARKED IN THE FIELD. A DOUBLE ROW OF SILT FENCE IS TO BE INSTALLED IN ALL AREAS WHERE A 50-FOOT BUFFER CAN NOT BE MAINTAINED BETWEEN THE DISTURBED AREA AND ALL WOS. A 10-FOOT BUFFER SHOULD BE MAINTAINED BETWEEN THE LAST ROW OF SILT FENCE AND ALL WOS

10. LITTER, CONSTRUCTION DEBRIS, OILS, FUELS, AND BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT (SUCH AS STOCKPILES OF FRESHLY TREATED LUMBER) AND CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE IN STORM WATER DISCHARGES.

11. A COPY OF THE SWPPP, INSPECTION RECORDS AND RAINFALL DATA MUST BE RETAINED AT THE CONSTRUCTION SITE OR A NEARBY LOCATION EASILY ACCESSIBLE DURING NORMAL BUSINESS HOURS, FROM THE DATE OF COMMENCEMENT OF CONSTRUCTION ACTIVITIES TO THE DATE THAT FINAL STABILIZATION IS REACHED.

12. INITIATE STABILIZATION MEASURES ON ANY EXPOSED STEEP SLOPE (3H:1V OR GREATER) WHERE LAND DISTURBING ACTIVITIES HAVE PERMANENTLY OR TEMPORARILY CEASED, AND WILL NOT RESUME FOR A PERIOD OF 7 CALENDAR DAYS.

13. MINIMIZE SOIL COMPACTION IN AREAS NOT UNDER PAVEMENTS AND /OR STRUCTURES AND, UNLESS INFEASIBLE, PRESERVE TOPSOIL.

14. MINIMIZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT AND VEHICLE WASHING, WHEEL WASH WATER AND OTHER WASH WATERS. WASH WATERS MUST BE TREATED IN A SEDIMENT BASIN OR ALTERNATIVE CONTROL THAT PROVIDES EQUAL OR BETTER TREATMENT PRIOR TO DISCHARGE.

15. MINIMIZE THE DISCHARGE OF POLLUTANTS FROM DEWATERING OF TRENCHES AND EXCAVATED AREAS. THESE DISCHARGES ARE TO BE ROUTED THROUGH APPROPRIATE BMPS (SEDIMENT BASIN, FILTER BAG, ETC.).

16. THE FOLLOWING DISCHARGES ARE PROHIBITED:

16.1. WASTEWATER FROM WASHOUT OF CONCRETE, UNLESS MANAGED BY AN APPROPRIATE CONTROL;
16.2. WASTEWATER FROM WASHOUT AND CLEANOUT OF OF STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS;
16.3. FUELS, OILS OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE; AND
16.4. SOAPS OR SOLVENTS USED IN VEHICLE AND EQUIPMENT WASHING.

17. AFTER CONSTRUCTION ACTIVITIES BEGIN, INSPECTIONS MUST BE CONDUCTED AT A MINIMUM OF AT LEAST ONCE EVERY CALENDAR WEEK AND MUST BE CONDUCTED UNTIL FINAL STABILIZATION IS REACHED ON ALL AREAS OF THE CONSTRUCTION SITE.

18. IF EXISTING BMPS NEED TO BE MODIFIED OR IF ADDITIONAL BMPS ARE NECESSARY TO COMPLY WITH THE REQUIREMENTS OF PERMIT SCR100000 AND/OR SC'S WATER QUALITY STANDARDS, IMPLEMENTATION MUST BE COMPLETED BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE. IF IMPLEMENTATION BEFORE THE NEXT STORM EVENT IS IMPRACTICABLE, THE SITUATION MUST BE DOCUMENTED IN THE SWPPP AND ALTERNATIVE BMPS MUST BE IMPLEMENTED AS SOON AS REASONABLY POSSIBLE.

19. A PRE-CONSTRUCTION CONFERENCE MUST BE HELD FOR EACH CONSTRUCTION SITE WITH AN APPROVED ON-SITE SWPPP PRIOR TO THE IMPLEMENTATION OF CONSTRUCTION ACTIVITIES. FOR NON-LINEAR PROJECTS THAT DISTURB 10 ACRES OR MORE, THIS CONFERENCE MUST BE HELD ON-SITE UNLESS THE DEPARTMENT HAS APPROVED OTHERWISE.

VII. EROSION, SEDIMENTATION & POLLUTION CONTROL NOTES

1. THE IMPLEMENTATION OF THESE EROSION SEDIMENT CONTROL (ESC) PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.

2. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.

3. THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT LEAVE THE SITE.

4. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.

5. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 24 HOURS FOLLOWING A MAJOR STORM EVENT.

6. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING AND PRIOR TO FINAL INSPECTION. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT LADEN WATER INTO THE DOWNSTREAM SYSTEM.

7. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

8. BEFORE COMMENCING ANY LAND DISTURBING ACTIVITY, THE EXISTING STORM WATER INLET(S) THAT RECEIVING RUNOFF FROM THE PROPOSED WORK AREA SHALL BE PROTECTED. THE TEMPORARY INLET PROTECTION MUST REMAIN IN PLACE UNTIL THE CONSTRUCTION ACTIVITY IS COMPLETED, THE STREET HAS BEEN SWEPT AND ANY EXPOSED SOILS ARE STABILIZED. THE CONTRACTOR IS ALSO RESPONSIBLE FOR REMOVING ANY TEMPORARY INLET PROTECTION INSTALLED; AFTER ALL DISTURBED AREAS ARE STABILIZED. TEMPORARY PROTECTION OF THE INLETS MAY BE ACCOMPLISHED BY ONE OR MORE OF THE FOLLOWING:

8.1. USE OF GRAVEL BAGS TO FILTER THE SEDIMENT FROM ANY RUNOFF. TO MAKE A GRAVEL BAG, USE A BAG MADE OF GEOTEXTILE FABRIC (NOT BURLAP) AND FILL WITH EITHER 3/4 INCH ROCK OR 1/4 INCH PEA GRAVEL.
8.2. USE OF SEDIMENT LOGS TO FILTER THE SEDIMENT FROM ANY RUNOFF (AVAILABLE THROUGH LOCAL EROSION CONTROL SUPPLIERS).
8.3. USE OF ABOVE OR UNDER-GRATE FILTER BAGS OR DEVICES TO FILTER THE SEDIMENT FROM ANY RUNOFF (AVAILABLE THROUGH EROSION CONTROL SUPPLIERS).

9. WATER MAY NOT BE DISCHARGED IN A MANNER THAT CAUSES EROSION, SEDIMENTATION, OR FLOODING ON THE SITE, ON DOWNSTREAM PROPERTIES, IN THE RECEIVING CHANNELS, OR IN ANY STORM WATER INLET. WHEN SITE DEWATERING, WATER PUMPED FROM THE SITE, INCLUDING TRENCHES, SHALL BE TREATED BY ONE OF THE FOLLOWING:

9.1. TEMPORARY SEDIMENTATION BASINS
9.2. SEDIMENT FILTERING BAGS

10. THE CONTRACTOR SHALL VERIFY THE SIZE AND LOCATION OF ALL EXISTING UTILITIES.

EXISTING UTILITIES ARE ALL UTILITIES THAT EXIST ON THE PROJECT IN AN ORIGINAL, RELOCATED OR NEWLY INSTALLED POSITION. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR THE COST OF REPAIRS TO DAMAGED UNDERGROUND OR OVERHEAD FACILITIES, EVEN IF THE UTILITY IS NOT SHOWN ON THE SITE DEVELOPMENT PLANS. THE CONTRACTOR SHALL CONTACT THE LOCAL UTILITIES PROTECTION CENTER TO COORDINATE THE MARKING OF EXISTING UTILITY LINES A MINIMUM OF 96 HOURS PRIOR TO COMMENCEMENT OF ANY WORK.

11. THE CONTRACTOR SHALL FLUSH ALL INLETS AND PIPE AT THE COMPLETION OF CONSTRUCTION TO REMOVE SILT AND DEBRIS. THE CLEANING AND FLUSHING OF INLETS AND PIPE (EXISTING AND PROPOSED) SHALL BE CONSIDERED PART OF THE COST FOR THE PROJECT.

12. EGRESS FROM THE SITE SHALL BE CONTROLLED SUCH THAT VEHICLES LEAVING THE SITE MUST TRAVERSE CONSTRUCTION EXITS TO REMOVE MUD FROM TIRES.

13. SCHEDULE CONSTRUCTION ACTIVITIES TO MINIMIZE THE EXPOSED AREA AND DURATION OF EXPOSURE. IN SCHEDULING, TAKE INTO ACCOUNT THE SEASON AND THE WEATHER FORECAST.

14. EROSION CONTROL MEASURES ARE THE MINIMUM REQUIRED. THE CONTRACTOR SHALL PROVIDE ADDITIONAL CONTROL MEASURES AS DICTATED BY ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION IN ORDER TO PREVENT EROSION AND CONTROL SEDIMENT. EROSION AND SEDIMENT CONTROL MEASURES WILL REMAIN IN PLACE AND BE MAINTAINED UNTIL THE ENTIRE PROJECT IS TERMINATED OR SUSPENDED FOR AND INDEFINITE LENGTH OF TIME, ALL DISTURBED AREAS SHALL BE PLANTED WITH PERMANENT VEGETATION.

15. THE DATA, TOGETHER WITH ALL OTHER INFORMATION SHOWN ON THESE PLANS, OR IN ANY WAY INDICATED THEREBY, WHETHER BY DRAWINGS OR NOTES, OR IN ANY OTHER MANNER, IS BASED UPON FIELD INVESTIGATIONS AND IS BELIEVED TO BE INDICATIVE OF ACTUAL CONDITIONS. HOWEVER, THE SAME IS SHOWN AS INFORMATION ONLY, IS NOT GUARANTEED AND DOES NOT BIND THOMAS & HUTTON, OR THE OWNER IN ANY WAY.

16. CONTRACTOR SHALL MAINTAIN SITE ON A DAILY BASIS TO PROVIDE FOR POSITIVE DRAINAGE. CONTRACTOR, AT HIS COST, SHALL GRADE SITE AND PROVIDE NECESSARY TEMPORARY DRAINAGE SWALES TO INSURE STORM WATER DOES NOT POND ON SITE.

17. SITE DRAINAGE SHALL BE ESTABLISHED TO PREVENT ANY PONDED WATER CONDITIONS WITHIN THE CONSTRUCTION AREA AND TO FACILITATE STORM WATER DISCHARGE.

18. THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES PRIOR TO, OR CONCURRENT WITH, LAND DISTURBING ACTIVITIES.

19. LIME RATES AND ANALYSIS:

19.1. AGRICULTURAL LIME SHALL BE APPLIED AT THE RATE SHOWN IN THE SEEDING SECTION UNLESS SOIL TESTS INDICATE OTHERWISE. GRADED AREAS REQUIRE LIME APPLICATION. IF LIME IS APPLIED WITHIN SIX MONTHS OF PLANTING PERMANENT PERENNIAL VEGETATION, ADDITIONAL LIME IS NOT REQUIRED. AGRICULTURAL LIME APPLICATION SHALL BE WITHIN THE SPECIFICATIONS

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STORMWATER POLLUTION PREVENTION PLAN

SCDOT SEEDING SCHEDULE FOR PERMANENT VEGETATION

SCHEDULE NO.	COMMON NAME OF SEED	RATE PER ACRE (Lbs) RURAL	RATE PER ACRE (Lbs) URBAN[1]	PLANTING DATES
3[5]	COMMON BERMUDA (HULLED)[3]	30	30	MARCH 1 TO AUG. 14
	WEEPING LOVEGRASS[2]	10	10	
	SERICEA LESPEDEZA (SCARIFIED)[2]	50	50	
4[5]	COMMON BERMUDA (UNHULLED)[3]	40	40	AUG. 15- TO FEB. 28
	WEEPING LOVEGRASS[2]	10	10	
	SERICEA LESPEDEZA (UNSCARIFIED, UNHULLED)[2]	80	80	
	RESEEDING CRIMSON CLOVER[4]	20	0	
	RYE GRAIN	20	0	

NOTES:

[1] INCLUDES RURAL AREAS ADJACENT TO WELL-DEVELOPED LAWNS.

[2] NOT REQUIRED ON SHOULDERS, MEDIANS, ETC., AND SLOPES UNDER 5 FEET IN HEIGHT

[3] GIANT BERMUDA SEED, INCLUDING NK-37 SHALL NOT BE USED.

[4] RESEEDING CRIMSON CLOSER SHALL BE INOCULATED IN ACCORDANCE WITH SUBSECTION 810.05. DO NOT PLANT CLOVER IN MEDIANS OR IN RURAL AREAS ADJACENT TO WELL-DEVELOPED LAWNS.

[5] PENSACOLA BAHIA SHALL BE ALLOWED ONLY AS SHOWN IN SEEDING SCHEDULES 3 AND 4 AT THE RATE OF 50 POUNDS PER ACRE ONLY WHEN SEEDING PIT AREAS THAT ARE GOVERNED BY THE SOUTH CAROLINA MINING ACT. OTHERWISE, DO NOT INCLUDE BAHIA SEED IN THE MIX.

SCDOT SEEDING SCHEDULE FOR TEMPORARY VEGETATION

SCEDULE NO.	COMMON NAME OF SEED	RATE PER ACRE (Lbs)	PLANTING DATES
1	ANNUAL SUDAN GRASS (SWEET OR TIFF)	40	APRIL 1 TO AUGUST 15
2	BROWN TOP MILLET	50	APRIL 1 TO AUGUST 15
3	RYE GRAIN	55	AUGUST 16 TO MARCH 31

EROSION CONTROL LEGEND

DESCRIPTION	PLAN SYMBOL
SILT FENCE	
CLEARING LIMITS	CL
DIVERSION DIKE	DD
DIVERSION BERM	DB
TEMPORARY DIVERSION	TD
PERMANENT DIVERSION	PD
SUBSURFACE DRAIN	SSD
VEGETATED CHANNEL	
RIP RAP LINED CHANNEL	
ECB OR TRM LINED CHANNEL	
PAVED CHANNEL	PC
TREE PROTECTION	
SURFACE ROUGHENING	OR LG
TOP SOILING	
TEMPORARY SEEDING	TS
PERMANENT SEEDING	PS
MULCHING	M
EROSION CONTROL BLANKET OR TURF REINFORCEMENT MAT	

EROSION CONTROL LEGEND

DESCRIPTION	PLAN SYMBOL
FLEXIBLE GROWTH MATRIX	FGM
BONDED FIBER MATRIX	BFM
SODDING	SO
SLOPED SODDING	
STAKED SOD	
STAKED SOD AROUND INLET	OR
RIPRAP	
OUTLET PROTECTION - RIP RAP	
OUTLET PROTECTION - ECB OR TRM	
DUST CONTROL	DC
POLYACRYLAMIDE (PAM)	PAM
SEDIMENT BASIN	
SEDIMENT BASIN WITH SKIMMER	
SEDIMENT TRAP	
ROCK SEDIMENT DIKE	
SEDIMENT TUBE	

EROSION CONTROL LEGEND

DESCRIPTION	PLAN SYMBOL
ROCK CHECK DAM	OR
POROUS BAFFLES	
STABILIZED CONSTRUCTION ENTRANCE	
CONCRETE WASHOUT	
STORM DRAIN INLET PROTECTION - TYPE A FILTER FABRIC	A
STORM DRAIN INLET PROTECTION - TYPE A SEDIMENT TUBE	A
STORM DRAIN INLET PROTECTION - TYPE B HARDWARE FABRIC AND STONE	B
STORM DRAIN INLET PROTECTION - TYPE C BLOCK AND GRAVEL	C
STORM DRAIN INLET PROTECTION - TYPE D RIGID INLET FILTER	D
STORM DRAIN INLET PROTECTION - TYPE E SURFACE COURSE CURB INLET FILTER	E
STORM DRAIN INLET PROTECTION - TYPE F INLET TUBE	F
STORM DRAIN INLET PROTECTION - TYPE G IMPERVIOUS AREA	G
STORM DRAIN INLET PROTECTION - CATCH BASIN INSERT	I
PIPE SLOPE DRAINS	
TEMPORARY STREAM CROSSING	
LEVEL SPREADER	

LIST OF ACRONYMS FOR SEDIMENT AND EROSION CONTROL

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AMD	ACRYLAMIDE POLYMER
BFM	BONDED FIBER MATRIX
BMP(S)	BEST MANAGEMENT PRACTICE(S)
CFS	CUBIC FEET PER SECOND
CMP	CORRUGATED METAL PIPE
DHEC	DEPARTMENT OF HEATH AND ENVIRONMENTAL CONTROL
ECB	EROSION CONTROL BLANKET
EPA	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
EPSC	EROSION PREVENTION AND SEDIMENTATION CONTROL
FDA	UNITED STATES FOOD AND DRUG ADMINISTRATION
FGM	FLEXIBLE GROWTH MATRIX
HDPE	HIGH DENSITY POLYETHYLENE
MS4	MUNICIPAL SEPARATE STORM SEWER SYSTEM
MSDS	MATERIAL SAFETY DATA SHEETS
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
PAM	POLYACRYLAMIDE OR POLYMER
RCP	REINFORCED CONCRETE PIPE
SCS	SOIL CONSERVATION SERVICE
SWPPP	STORMWATER POLLUTION PREVENTION PROGRAM
TRM	TURF REINFORCEMENT MAT
VFS	VEGETATED FILTER STRIP

ALL ITEMS IN SECTION 10D OF THE CURRENT ARMS MANUAL FOR BOTH CONSTRUCTIONS AND POST CONSTRUCTION DESIGN HAVE BEEN STUDIED AND ADDRESSED. ALL NECESSARY BMPS HAVE BEEN IMPLEMENTED FOR BOTH PHASES (CONSTRUCTION AND POST-CONSTRUCTION) TO AVOID NEGATIVELY IMPACTING IMPAIRED WATERS OF THE SCDOT SYSTEM AND/OR ITSDISCHARGES. ALL REQUIREMENTS IN SECTION 10B OF THE CURRENT ARMS MANUAL FOR POST DEVELOPMENT RELEASE RATES HAVE BEEN MET. THERE WILL BE ZERO INCREASE IN RUNOFF TO SCDOT RIGHT OF WAY.

CONSTRUCTION SEQUENCE

	CONSTRUCTION ACTIVITY	SCHEDULE CONSIDERATION
1	OBTAIN COPIES OF ALL PLAN APPROVALS AND OTHER APPLICABLE PERMITS.	CONTRACTOR TO HAVE ONSITE AT ALL TIMES DURING CONSTRUCTION.
2	FLAG THE WORK LIMITS AND BARRICADE TREES AND MARK BUFFER AREAS FOR PROTECTION.	HAVE LOCAL REGULATORY AGENCY INSPECT TREE BARRICADES.
3	HOLD PRE CONSTRUCTION CONFERENCE AT LEAST ONE WEEK PRIOR TO STARTING CONSTRUCTION.	REVIEW TREE PROTECTION (BARRICADE) WITH OWNER AND LOCAL REGULATORY AGENCY. TAKE PICTURES OF ALL PROTECTED TREES AND LOCATIONS WHERE SITE WORK TIES INTO EXISTING TO DOCUMENT PREDEVELOPMENT PROCEDURES.
4	INSTALL CONSTRUCTION ACCESS AND LAY DOWN AREAS	STABILIZE BARE AREAS IMMEDIATELY AND INSTALL CONSTRUCTION EXITS / ENTRANCES.
5	CONSTRUCT SEDIMENT TRAPS AND BARRIERS - BASIN TRAPS, SEDIMENT FENCES, AND OUTLET PROTECTION.	INSTALL PRINCIPAL BASINS AFTER CONSTRUCTION SITE IS ACCESSED. INSTALL ADDITIONAL TRAPS AND BARRIERS AS NEEDED DURING GRADING.
6	ESTABLISH RUNOFF CONTROL - DIVERSIONS, PERIMETER DIKES, WATER BARS, AND OUTLET PROTECTION.	INSTALL KEY PRACTICES AFTER PRINCIPAL SEDIMENT TRAPS AND BEFORE LAND GRADING. INSTALL ADDITIONAL RUNOFF-CONTROL MEASURES DURING GRADING.
7	LAND CLEARING AND GRADING-SITE PREPARATION CUTTING, FILLING AND GRADING, SEDIMENTATION TRAPS, BARRIERS, DIVERSIONS, DRAINS, SURFACE ROUGHENING.	BEGIN MAJOR CLEARING AND GRADING AFTER PRINCIPAL SEDIMENT AND KEY RUNOFF-CONTROL MEASURES ARE INSTALLED. CLEAR BORROW AND DISPOSAL AREAS ONLY AS NEEDED. INSTALL ADDITIONAL CONTROL MEASURES AS GRADING PROGRESSES. MARK TREES AND BUFFER AREAS FOR PRESERVATION.
8	RUNOFF CONVEYANCE SYSTEM- INSTALL STORM DRAINS. STABILIZE BANKS, CHANNELS, INSTALL INLET AND OUTLET PROTECTION, SLOPE DRAINS.	WHERE NECESSARY, STABILIZE BANKS AS EARLY AS POSSIBLE. INSTALL PRINCIPAL RUNOFF CONVEYANCE SYSTEM WITH RUNOFF- CONTROL MEASURES. INSTALL REMAINDER OF SYSTEM AFTER GRADING.
9	INSTALL WASTEWATER COLLECTION, WATER DISTRIBUTION, AND STORM DRAINAGE SYSTEMS	APPLY TEMPORARY OR PERMANENT STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS WHERE WORK IS DELAYED OR COMPLETE.
10	SURFACE STABILIZATION-TEMPORARY AND PERMANENT SEEDING, MULCHING, SODDING, RIP RAP.	APPLY TEMPORARY OR PERMANENT STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS WHERE WORK IS DELAYED OR COMPLETE.
11	BUILDING CONSTRUCTION- BUILDINGS UTILITIES, ROADS, ETC.	INSTALL NECESSARY EROSION AND SEDIMENTATION CONTROL PRACTICES AS WORK TAKES PLACE.
12	LANDSCAPING AND FINAL STABILIZATION - TOPSOILING, TREES AND SHRUBS, PERMANENT SEEDING, MULCHING, SODDING, RIP RAP.	LAST CONSTRUCTION PHASE--STABILIZE ALL OPEN AREAS, INCLUDING BORROW AND SPOIL AREAS. REMOVE AND STABILIZE ALL TEMPORARY CONTROL MEASURES.

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARON 12/5/2025

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

THOMAS & HUTTON

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

SWPPP CHARTS

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

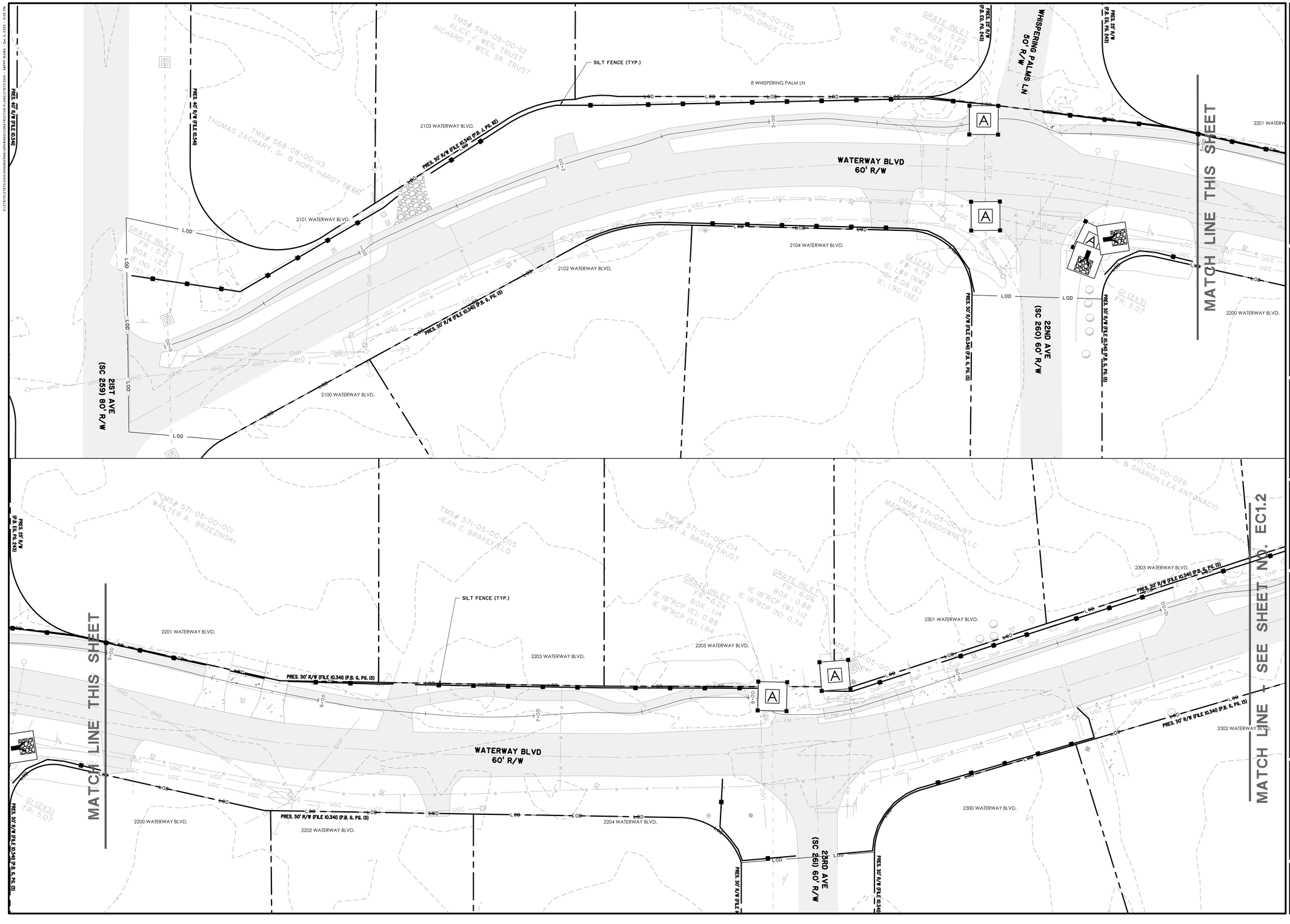
CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/11/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	N/A

N/A

EC0.2



NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER
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RICHARD PETER KARON
12/5/2024

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SWPPP INITIAL

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P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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GRAPHIC SCALE:
1 INCH = 20 FEET

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GRAPHIC SCALE:
1 INCH = 20 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/19/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

EC1.1

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARON 12/5/2024

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MATCH LINE - SEE SHEET NO. EC1.2

MATCH LINE - SEE SHEET NO. EC1.4

MATCH LINE THIS SHEET

MATCH LINE THIS SHEET

DRIFTWOOD LANE
50' R/W

WATERWAY BLVD
60' R/W

26TH AVE
(SC 595) 60' R/W

27TH AVE
(SC 596) 60' R/W

SEAHORSE COURT
50' R/W

ENSIGN COURT
50' R/W

28TH AVE
60' R/W

1 DRIFTWOOD LN

2 DRIFTWOOD LN

1 SEAHORSE COURT

2 SEAHORSE CT

1 ENSIGN CT

2600 WATERWAY BLVD.

2602 WATERWAY BLVD.

2604 WATERWAY BLVD.

2700 WATERWAY BLVD

2702 WATERWAY BLVD

2704 WATERWAY BLVD

2800 WATERWAY BLVD

2802 WATERWAY BLVD

TMS# 571-05-00-160
DAVID R. SYKES IRREVOCABLE TRUST

TMS# 571-05-00-171
MARGARET PATER 2013 TRUST &
ORAZIO PATER 2013 TRUST

TMS# 571-05-00-213
CHRISTOPHER G. & SHARYN L. NICHOLS

TMS# 571-05-00-197
CITY OF I O P COMM
OF PUBLIC WORKS

TMS# 571-05-00-198 / TOP: 2.66
BRUCE D. & DORIS A. LINDSEY

TMS# 571-05-00-196
ANTOINE MAKHLOUTA &
KATHLEEN ELLEN ASHTON

CRITICAL LINE

DOUBLE ROW
SILT FENCE

LOD

OHP

SS

PRES. 30' R/W (FILE 10.545) (P.B. BB, PG. 20)

PRES. 25' R/W (P.B. AH, PG. 132)

PRES. 30' R/W (FILE 10.545) (P.B. S, PG. 69)

PRES. 30' R/W (FILE 10.545) (P.B. U, PG. 72)

PRES. 30' R/W (FILE 10.545) (P.B. T, PG. 97)

PRES. 25' R/W (P.B. CR, PG. 122)

SD MANHOLE
FR: 6.32
BOX: 1.08
IE RCP (N): 1.08
IE RCP (S): 1.12
IE 18"RCP (E): 2.48
IE 18"RCP (W): 2.20

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 18837
RICHARD PETER KARG
12/5/2025

SOUTH CAROLINA
THOMAS & HUTTON ENGINEERING CO.
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REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

EC1.3

J:\27670\27670.0010\ENGINEERING\DRAWINGS\CONSTRUCTION PLANS\27670.0010 - SWPPP.DWG - Dec 5, 2025 - 10:35 PM

MATCH LINE - SEE SHEET NO. EC1.3

MATCH LINE THIS SHEET

MATCH LINE THIS SHEET

MATCH LINE - SEE SHEET NO. EC1.5

WATERWAY BLVD
60' R/W

29TH AVE
60' R/W

30TH AVE
(SC 918) 60' R/W

2 ENSIGN CT

2804 WATERWAY BLVD

2902 WATERWAY BLVD

2904 WATERWAY BLVD

2906 WATERWAY BLVD

2907 WATERWAY BLVD

2905 WATERWAY BLVD

2903 WATERWAY BLVD

2900 WATERWAY BLVD

2911 WATERWAY BLVD

3001 WATERWAY BLVD

3003 WATERWAY BLVD

3005 WATERWAY BLVD

3007 WATERWAY BLVD

3009 WATERWAY BLVD

3011 WATERWAY BLVD

2908 WATERWAY BLVD

3000 WATERWAY BLVD

3002 WATERWAY BLVD

3004 WATERWAY BLVD

TMS# 571-05-00-197
CITY OF I O P COMM
DEPT OF PUBLIC WORKS

TMS# 571-05-00-175
ISLE OF PALMS WATER
AND SEWER COMMISSION

TMS# 571-05-00-174
CITY OF I O P COMM
DEPT OF PUBLIC WORKS

TMS# 571-05-00-172
ROGER W. & LINDA T. STREIGHT REVOCABLE TRUST

TMS# 571-05-00-173
JAMES DONALD REID

TMS# 571-06-00-152
ROCOSO TRUST

TMS# 571-06-00-151
THE HARVEST COMPANY, INC. OF

TMS# 571-06-00-149
MICHAEL & JILL BRIGHT

TMS# 571-06-00-
FOULKE LIVING TR

TMS# 571-06-00-151
COMPANY INC. OF CHARLESTON

TMS# 571-06-00-152
TIMMERMAN LIVING TRUST

TMS# 571-06-00-
HIPP FAMILY

SILT FENCE (TYP.)

PRES. 30' R/W (FILE 10.545) (P.B. BB, PG. 20)

PRES. 30' R/W (FILE 10.545) (P.B. T, PG. 97)

PRES. 30' R/W (FILE 10.545) (P.B. S, PG. 107)

PRES. 30' R/W (FILE 10.545) (P.B. X, PG. 109)

PRES. 30' R/W (FILE 10.469) (P.B. BB, PG. 20)

PRES. 30' R/W (FILE 10.469) (P.B. X, PG. 13)

LOD

OHP

SS

GRATE INLET
FR : 6.93

GRATE INLET
FR : 6.92

GRATE INLET
FR : 6.96

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 18837
12/5/2025
RICHARD PETER KARG

SOUTH CAROLINA
THOMAS & HUTTON ENGINEERING CO.
No. C00265
CERTIFICATE OF AUTHORIZATION

THOMAS & HUTTON

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

SWPPP INITIAL

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

20 0 10 20
GRAPHIC SCALE:
1 INCH = 20 FEET

20 0 10 20
GRAPHIC SCALE:
1 INCH = 20 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

EC1.4

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARDOS 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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SWPPP INITIAL

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/11/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

EC1.5

Z:\27670\01-CIVIL\00-DWG\ENGINEERING\DRAWINGS\CONSTRUCTION PLANS\27670.000 - SWPPP INITIAL - Dec 5, 2025 - 10:35 PM

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 18837
RICHARD PETER KARCH
12/5/2025

SOUTH CAROLINA
CERTIFICATE OF AUTHORIZATION
THOMAS & HUTTON ENGINEERING CO.
No. C00265

THOMAS & HUTTON

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SWPPP INITIAL

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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GRAPHIC SCALE:
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DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

EC1.6

Z:\27670\27670.0010\ENGINEERING\DRAWINGS\CONSTRUCTION PLANS\27670-0010 - SWPPP.DWG - Dec 5, 2025 - 10:35 PM

MATCH LINE - SEE SHEET NO. EC1.6

MATCH LINE THIS SHEET

SILT FENCE (TYP.)

CRITICAL LINE

PRES. 30' R/W (FILE 10.604) (P.B. BB, PG. 20)

WATERWAY BLVD
60' R/W

FOREST TRAIL
50' R/W

PRES. 30' R/W (FILE 10.604) (P.B. X, PG. 139)

PRES. VAR. R/W (P.B. X, PG. 139)

LOD

SS

3502 WATERWAY BLVD

3504 WATERWAY BLVD

3600 WATERWAY BLVD

3602 WATERWAY BLVD

TMS# 571-00-00-001
WILD DUNES LLC
HARBOR GOLF COURSE

TMS# 571-07-00-022
PAT R. ROSS & THOMAS J. P

TMS# 571-07-00-162
JOHN M. AND
LYNN Z. GARLAND

TMS# 571-07-
BRIAN J. DUFFY, RE
CATHERINE L. MALLORY

SD MANHOLE
RIM=6.63
INV=2.63

CRITICAL LINE

DOUBLE ROW
SILT FENCE

PRES. 30' R/W (FILE 10.604) (P.B. BB, PG. 20)

WATERWAY BLVD
60' R/W

PRES. 30' R/W (FILE 10.604) (P.B. AB, PG. 22)

3604 WATERWAY BLVD

3605 WATERWAY BLVD

3606 WATERWAY BLVD

3607 WATERWAY BLVD

3608 WATERWAY BLVD

3609 WATERWAY BLVD

3610 WATERWAY BLVD

3611 WATERWAY BLVD

3612 WATERWAY BLVD

3613 WATERWAY BLVD

MATCH LINE - SEE SHEET NO. EC1.8

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 18837
12/5/2025
RICHARD PETER KARCHER

SOUTH CAROLINA
THOMAS & HUTTON ENGINEERING CO.
No. C00265
CERTIFICATE OF AUTHORIZATION

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SWPPP INITIAL

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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20 0 10 20
GRAPHIC SCALE:
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DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/17/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

EC1.7

Z:\27670\27670.0010\ENGINEERING\DRAWINGS\CONSTRUCTION PLANS\27670.0010 - SWPPP.DWG - Dec 5, 2025 - 10:35 PM

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 11/5/2025

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

THOMAS & HUTTON

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SWPPP INITIAL

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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GRAPHIC SCALE:
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DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/11/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

EC1.8

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARCH 11/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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SWPPP INITIAL

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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GRAPHIC SCALE:
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GRAPHIC SCALE:
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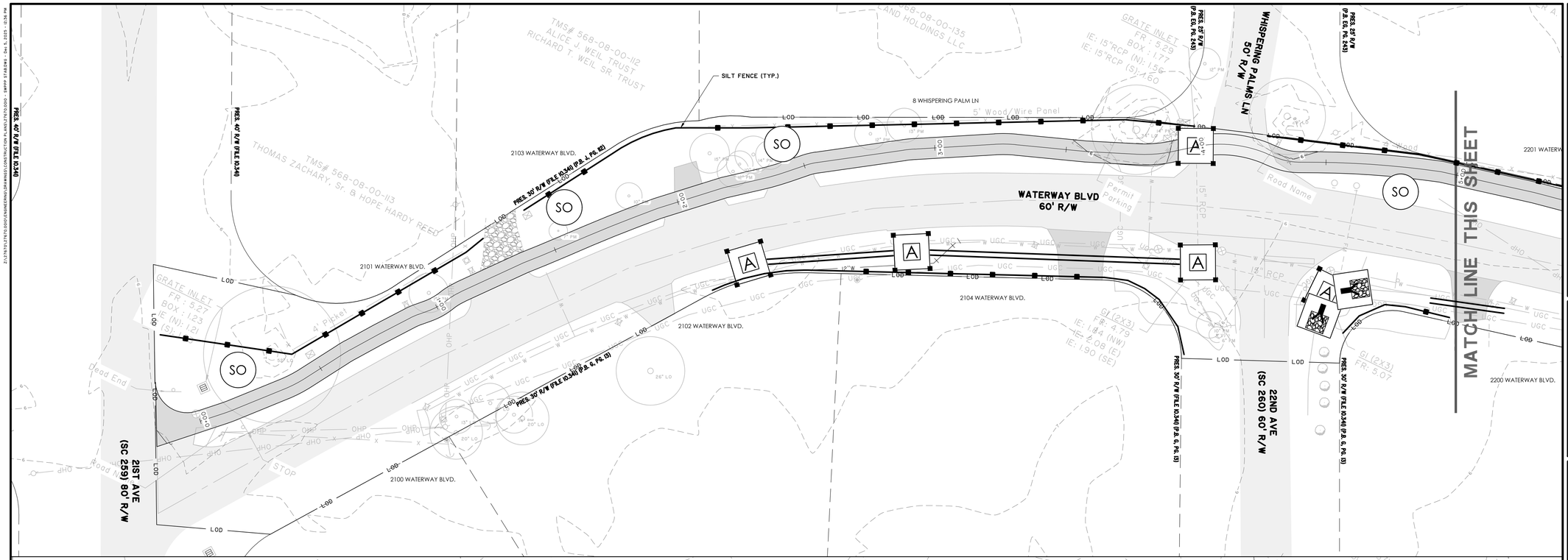
DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

EC1.9



NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARON 12/5/2024

THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

THOMAS & HUTTON

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SWPPP STABILIZATION

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

20 0 10 20
GRAPHIC SCALE:
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GRAPHIC SCALE:
1 INCH = 20 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

EC2.1

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARON 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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SWPPP STABILIZATION

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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GRAPHIC SCALE:
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DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

EC2.2

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18637 RICHARD PETER KARG 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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SWPPP STABILIZATION

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

20 0 10 20
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GRAPHIC SCALE:
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DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/11/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

EC2.3

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARON 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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SWPPP STABILIZATION

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

20 0 10 20
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GRAPHIC SCALE:
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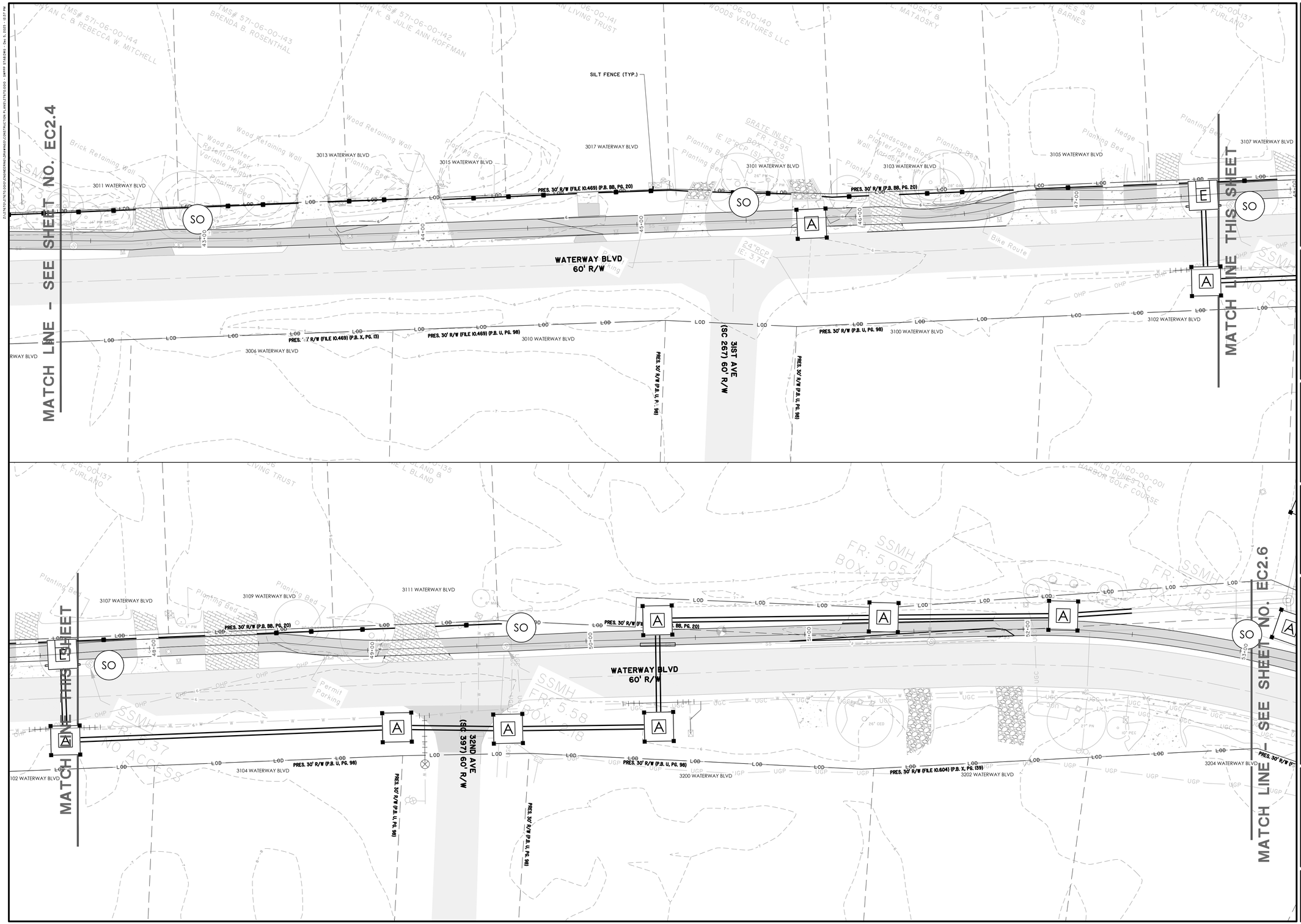
DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/11/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

EC2.4



NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARNS 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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SWPPP STABILIZATION

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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GRAPHIC SCALE:
1 INCH = 20 FEET

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GRAPHIC SCALE:
1 INCH = 20 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

EC2.5

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARDOS 12/5/2024

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION THOMAS & HUTTON ENGINEERING CO. No. C00265

THOMAS & HUTTON

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SWPPP STABILIZATION

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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EC2.6

Z:\27670\27670.0010\ENGINEERING\DRAWINGS\CONSTRUCTION PLANS\27670.0010 - SWPPP STABILIZ - Dec 5, 2025 - 12:31 PM

MATCH LINE - SEE SHEET NO. EC2.6

MATCH LINE THIS SHEET

SILT FENCE (TYP.)

CRITICAL LINE

TMS# 571-00-00-001
WILD DUNES LLC
HARBOR GOLF COURSE

SSMH
SSMH 4
FR: 6.26

PRES. 30' R/W (FILE 10.604) (P.B. BB, PG. 20)

WATERWAY BLVD
60' R/W

Permit Parking

FOREST TRAIL
50' R/W

PRES. VAR. R/W (P.B. X, PG. 139)

PRES. 30' R/W (FILE 10.604) (P.B. X, PG. 139)

3502 WATERWAY BLVD

3504 WATERWAY BLVD

3600 WATERWAY BLVD

3602 WATERWAY BLVD

TMS# 571-07-00-022
PAT R. ROSS & THOMAS J. R

TMS# 571-07-00-162
JOHN M. AND
LYNN Z. GARLAND

TMS# 571-07-
BRIAN J. DUFFY, RE
CATHERINE L. MALLORY

CRITICAL LINE

DOUBLE ROW
SILT FENCE

TRASH ENCLOSURE

FR: SSMH
RIM: 4.92
INV: 2.25

3605 WATERWAY BLVD

3607 WATERWAY BLVD

3609 WATERWAY BLVD

3611 WATERWAY BLVD

3613 WATERWAY BLVD

Planting Bed

FR: SSMH
BOX: 4.63

PRES. 30' R/W (FILE 10.604) (P.B. BB, PG. 20)

WATERWAY BLVD
60' R/W

PRES. 30' R/W (FILE 10.604) (P.B. AB, PG. 22)

3604 WATERWAY BLVD

3606 WATERWAY BLVD

3608 WATERWAY BLVD

3610 WATERWAY BLVD

3612 WATERWAY BLVD

MATCH LINE - SEE SHEET NO. EC2.8

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 18837
12/5/2025
RICHARD PETER KARG

SOUTH CAROLINA
CERTIFICATE OF AUTHORIZATION
THOMAS & HUTTON ENGINEERING CO.
No. C00265

THOMAS & HUTTON

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Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

SWPPP STABILIZATION

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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DRAWN:	MCV
DESIGNED:	MCV
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APPROVED:	RPK
SCALE:	SEE SCALE BAR

EC2.7

Z:\27670.0010 ENGINEERING\DRAWINGS\CONSTRUCTION PLANS\27670.0010 - SWPPP STABILIZATION.DWG - Dec 5, 2025 - 10:37 PM

MATCH LINE - SEE SHEET NO. EC2.7

MATCH LINE THIS SHEET

MATCH LINE THIS SHEET

MATCH LINE - SEE SHEET NO. EC2.9

3613 WATERWAY BLVD

3615 WATERWAY BLVD

3614 WATERWAY BLVD

3616 WATERWAY BLVD

3618 WATERWAY BLVD

3900 WATERWAY BLVD

3902 WATERWAY BLVD

3904 WATERWAY BLVD

3906 WATERWAY BLVD

4000 WATERWAY BLVD

4003 WATERWAY BLVD

WATERWAY BLVD
60' R/W

DUCK LN
50' R/W
(SC 1971)

SPARROW DRIVE
(SC 1998) 50' R/W

SILT FENCE (TYP.)

PRES. 30' R/W (FILE 10.604) (P.B. BB, PG. 20)

PRES. 30' R/W (FILE 10.604) (P.B. AB, PG. 22)

PRES. 30' R/W (FILE 10.604) (P.B. AB, PG. 100)

PRES. 25' R/W (P.B. AB, PG. 100)

LOD

SO

A

SSMH
RIM: 6.07
INVERT: 0.45

SSMH
RIM: 4.69
NO ACCESS

SSMH
RIM: 4.82
INVERT: 4.13

Planting Bed

Golfers Only

Bike Route

No Parking

Permit Parking Only

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 18837
RICHARD PETER KARG
12/5/2025

SOUTH CAROLINA
CERTIFICATE OF AUTHORIZATION
THOMAS & HUTTON ENGINEERING CO.
No. C00265

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SWPPP STABILIZATION

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SCALE:	SEE SCALE BAR

EC2.8

MATCH LINE - SEE SHEET NO. EC2.8

MATCH LINE THIS SHEET

MATCH LINE THIS SHEET

INTRACOASTAL COURT
60' R/W

WATERWAY BLVD
60' R/W

41ST AVE
(SC 914) 80' R/W

2 INTRACOASTAL CT

4003 WATERWAY BLVD

4000 WATERWAY BLVD

SILT FENCE (TYP.)

PRES. 30' R/W (FILE 10.604) (P.B. BB, PG. 20)

PRES. 30' R/W (FILE 10.604) (P.B. AB, PG. 100)

PRES. 30' R/W (P.B. CH, PG. 8)

PRES. 40' R/W (FILE 10.603A) (P.B. AH, PG. 100)

PRES. 40' R/W (FILE 10.603A) (P.B. AB, PG. 100)

TMS# 571-07-00-159
JOHN S. & DONNA G. BRENNER

TMS# 571-08-00-019
CITY OF ISLE OF PALMS

TMS# 571-08-00-226
WILD DUNES LLC

TMS# 571-07-00-XXX
ISLE OF PALMS WATER AND SEWER COMMISSION

CURB INLET
FR: 4.92
BOX: 1.17
IE: 1.13 (W): 1.14

CURB INLET
FR: 4.98
BOX: 0.23
IE: 1.81 (W): 1.14

SSMH
FR: 5.21
BOX: 1.92

24"RCP
IE: 1.03

SD MANHOLE
FR: 4.44
NO ACCESS

24"RCP
IE: 0.63

GRATE INLET
FR: 5.70
BOX: 3.62
IE: 10"PVC (SW): 3.78
IE: 10"PVC (NE): 3.78
IE: 10"PVC (NW): 3.81

GRATE INLET
FR: 5.12
BOX: 1.78
IE: 18"RCP (W): 2.36

10" UNDETECTION ONLY

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 18837
RICHARD PETER KARON
12/5/2024

SOUTH CAROLINA
THOMAS & HUTTON ENGINEERING CO.
No. C00265
CERTIFICATE OF AUTHORIZATION

THOMAS & HUTTON

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Mt. Pleasant, SC 29464 • 843.849.0200
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SWPPP STABILIZATION

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
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P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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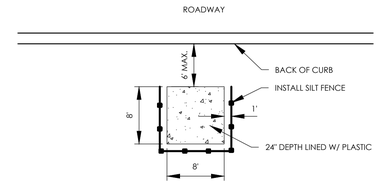
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

EC2.9

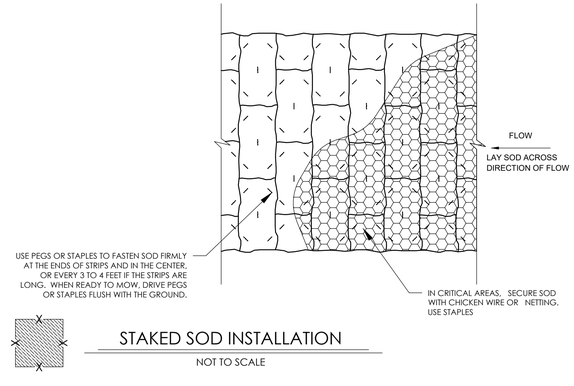
SCDOT DETAIL REFERENCE	
DETAIL #	**DETAIL NAME**
815-605-00	SEDIMENT DAM FOR PIPE INLET
815-001-01	EROSION CONTROL - TYPE A INLET STRUCTURE FILTERS
815-005-00	EROSION CONTROL - TYPE E INLET STRUCTURE FILTERS
815-006-00	EROSION CONTROL - TYPE F INLET STRUCTURE FILTERS
815-505-00	EROSION CONTROL - STABILIZED CONSTRUCTION ENTRANCE

NOTE: WIRE REINFORCED FABRIC SHALL BE USED FOR ALL FILTER FABRIC INLET PROTECTION.
WEBSITE: https://www.scdot.org/business/standard-drawings.aspx



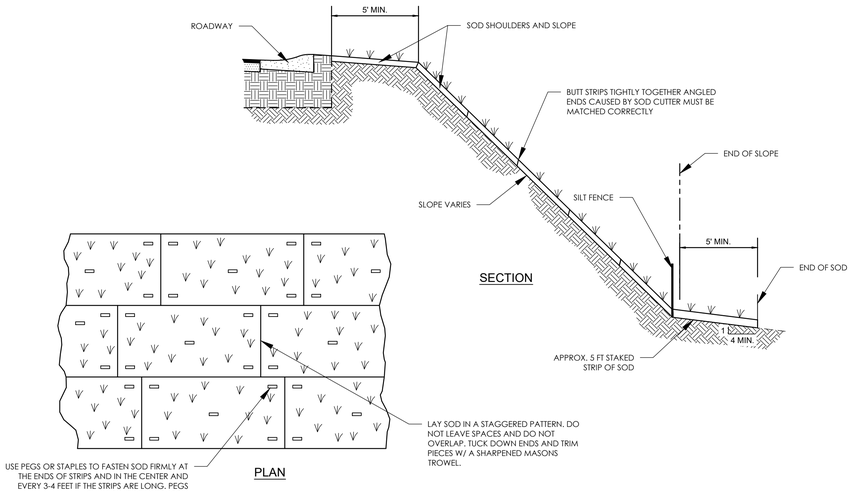
CONCRETE WASHOUT DETAIL

NOT TO SCALE



STAKED SOD INSTALLATION

NOT TO SCALE



SECTION

PLAN

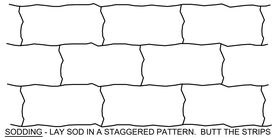
INSTALLATION AND MAINTENANCE OF SOD SHALL BE IN ACCORDANCE WITH "EROSION AND SEDIMENT CONTROL PRACTICES FOR DEVELOPING AREAS" BY THE SOUTH CAROLINA RESOURCES CONSERVATION COMMISSION.

THE FIRST ROW OF SOD SHOULD BE LAID IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO AND BUTTING TIGHTLY AGAINST EACH OTHER. JOINTS SHOULD BE STAGGERED TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH AND TO REDUCE THE CHANCE OF WASHOUTS UNDERNEATH THE SOD. CARE SHOULD BE EXERCISED TO INSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE DRYING OF THE ROOTS. SMALL GAPS OR VOIDS REMAINING AFTER THE SOIL IS LAID SHOULD BE FILLED WITH TOPSOIL.

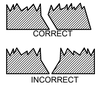
PROVIDE STRONGLY ROOTED ST AUGUSTINE SOD, NOT LESS THAN 2 YEARS OLD AND FREE OF WEEDS AND UNDESIRABLE NATIVE GRASSES. PROVIDE ONLY SOD CERTIFIED BY THE CROP PEST COMMISSION CAPABLE OF GROWTH WHEN PLANTED (VIABLE NOT DORMANT), AND IN STRIPS OF NOT MORE THAN 18 INCHES WIDE AND 72 INCHES LONG.

SLOPED SODDING DETAIL

NOT TO SCALE



SODDING - LAY SOD IN A STAGGERED PATTERN. BUTT THE STRIPS TIGHTLY AGAINST EACH OTHER. DO NOT LEAVE SPACES AND DO NOT OVERLAP. A SHARPENED MASON'S TROWEL IS A HANDY TOOL FOR TUCKING DOWN THE ENDS AND TRIMMING PIECES.



BUTTING - ANGLED ENDS CAUSED BY THE AUTOMATIC SOD CUTTER MUST BE MATCHED CORRECTLY

ROLL SOD IMMEDIATELY TO ACHIEVE FIRM CONTACT WITH THE SOIL. WATER TO A DEPTH OF 4" AS NEEDED. WATER WELL AS SOON AS THE SOD IS LAID. MOW WHEN THE SOD IS ESTABLISHED - IN 2 - 3 WEEKS. SET THE MOWER HIGH (2"-3").

SO

SODDING

NOT TO SCALE

SPECIFICATIONS:
IF FEASIBLE, SOD SHOULD NOT BE LAID IN EXCESSIVELY WET OR DRY WEATHER.

DURING PERIODS OF HIGH TEMPERATURE, OR IF THE SOIL IS DRY, THE SOIL SHOULD BE LIGHTLY IRRIGATED IMMEDIATELY PRIOR TO LAYING THE SOD.

THE FIRST ROW OF SOD SHOULD BE LAID IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO AND BUTTING TIGHTLY AGAINST EACH OTHER. JOINTS SHOULD BE STAGGERED TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH AND TO REDUCE THE CHANCE OF WASHOUTS UNDERNEATH THE SOD. CARE SHOULD BE EXERCISED TO INSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE DRYING OF THE ROOTS. SMALL GAPS OR VOIDS REMAINING AFTER THE SOIL IS LAID SHOULD BE FILLED WITH TOPSOIL.

PLACEMENT SHOULD BEGIN AT THE LOWER END OF SLOPES AND CHANNELS. ON SLOPES 3:1 OR GREATER, OR WHEREVER EROSION MAY BE A PROBLEM, SOD SHOULD BE SECURED BY PEGGING OR OTHER APPROVED METHODS. SOD SHOULD BE INSTALLED WITH THE LENGTH PERPENDICULAR TO THE SLOPE (ON THE CONTOUR).

AS SODDING IS COMPLETED, SOD SHOULD BE ROLLED OR TAMPED TO PROVIDE FIRM CONTACT BETWEEN ROOTS AND SOIL.

AFTER ROLLING, SOD SHOULD BE IRRIGATED TO A DEPTH SUFFICIENT THAT THE UNDERSIDE OF THE SOD PAD AND THE SOIL 4" BELOW THE SOD IS THOROUGHLY WET.

ESTABLISHMENT AND MAINTENANCE OF SOD:
DURING THE FIRST 3 - 4 WEEKS WATERING SHOULD BE PERFORMED AS OFTEN AS NECESSARY TO MAINTAIN MOIST SOIL TO A DEPTH OF AT LEAST 2 INCHES.

THE FIRST MOWING SHOULD NOT BE ATTEMPTED UNTIL THE SOD IS FIRMLY ROOTED, USUALLY 2 - 3 WEEK. THE MOWER SHOULD BE SET HIGH (2 -3 INCHES) FOR THE FIRST MOWING. NO MORE THAN 1/3 OF THE SHOOT (GRASS LEAF) SHOULD BE REMOVED IN ANY MOWING.

FERTILIZER SHOULD BE APPLIED, AS NECESSARY, TO OBTAIN AND MAINTAIN THE DESIRED GROWTH AND DENSITY. LIME SHOULD BE ADDED, AS NEEDED, TO MAINTAIN PROPER pH. SOIL SHOULD BE TESTED EVERY 1 - 2 YEARS TO DETERMINE FERTILIZER AND LIME REQUIREMENTS.

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18637 RICHARD PETER KARON 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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

SWPPP DETAILS

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/11/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	N/A

EC4.1

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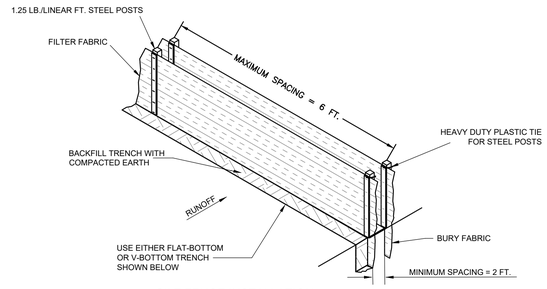
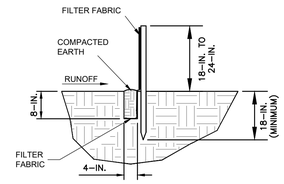
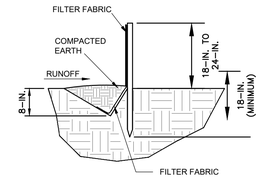


SILT FENCE INSTALLATION



FLAT-BOTTOM TRENCH DETAIL



V-SHAPED TRENCH DETAIL

WHEN AND WHERE TO USE IT:
SILT FENCE IS APPLICABLE IN AREAS:

WHERE THE MAXIMUM SHEET OR OVERLAND FLOW PATH LENGTH TO THE FENCE IS 100-FEET.
WHERE THE MAXIMUM SLOPE STEEPNESS (NORMAL [PERPENDICULAR] TO FENCE LINE) IS 2H:1V.
THAT DO NOT RECEIVE CONCENTRATED FLOWS GREATER THAN 0.5 CFS.

DO NOT PLACE SILT FENCE ACROSS CHANNELS OR USE IT AS A VELOCITY CONTROL BMP.

MATERIALS:
STEEL POSTS
USE 48-INCH LONG STEEL POSTS THAT MEET THE FOLLOWING MINIMUM PHYSICAL REQUIREMENTS:
COMPOSED OF HIGH STRENGTH STEEL WITH MINIMUM YIELD STRENGTH OF 50,000 PSI.
HAVE A STANDARD "T" SECTION WITH A NOMINAL FACE WIDTH OF 1.38-INCHES AND NOMINAL "T" LENGTH OF 1.48-INCHES.
WEIGH 1.25 POUNDS PER FOOT (± 8%).
HAVE A SOIL STABILIZATION PLATE WITH A MINIMUM CROSS SECTION AREA OF 17-SQUARE INCHES ATTACHED TO THE STEEL POSTS.
PAINTED WITH A WATER BASED BAKED ENAMEL PAINT.

USE STEEL POSTS WITH A MINIMUM LENGTH OF 4-FEET, WEIGHING 1.25 POUNDS PER LINEAR FOOT (± 8%) WITH PROJECTIONS TO AID IN FASTENING THE FABRIC. EXCEPT WHEN HEAVY CLAY SOILS ARE PRESENT ON SITE, STEEL POSTS WILL HAVE A METAL SOIL STABILIZATION PLATE WELDED NEAR THE BOTTOM SUCH THAT WHEN THE POST IS DRIVEN TO THE PROPER DEPTH, THE PLATE WILL BE BELOW THE GROUND LEVEL FOR ADDED STABILITY.
THE SOIL PLATES SHOULD HAVE THE FOLLOWING CHARACTERISTICS:
BE COMPOSED OF MINIMUM 15 GAUGE STEEL.
HAVE A MINIMUM CROSS SECTION AREA OF 17-SQUARE INCHES.

GEOTEXTILE FILTER FABRIC:
FILTER FABRIC IS:
COMPOSED OF FIBERS CONSISTING OF LONG CHAIN SYNTHETIC POLYMERS COMPOSED OF AT LEAST 85% BY WEIGHT OF POLYOLEFINS, POLYESTERS, OR POLYAMIDES.
FORMED INTO A NETWORK SUCH THAT THE FILAMENTS OR YARNS RETAIN DIMENSIONAL STABILITY RELATIVE TO EACH OTHER.
FREE OF ANY TREATMENT OR COATING WHICH MIGHT ADVERSELY ALTER ITS PHYSICAL PROPERTIES AFTER INSTALLATION.
FREE OF DEFECTS OR FLAWS THAT SIGNIFICANTLY AFFECT ITS PHYSICAL AND/OR FILTERING PROPERTIES.
CUT TO A MINIMUM WIDTH OF 36 INCHES.

USE ONLY FABRIC APPEARING ON SCDOT APPROVAL SHEET #34 MEETING THE REQUIREMENTS OF THE MOST CURRENT EDITION OF THE SCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

INSTALLATION:
EXCAVATE A TRENCH APPROXIMATELY 6-INCHES WIDE AND 6-INCHES DEEP WHEN PLACING FABRIC BY HAND. PLACE 12-INCHES OF GEOTEXTILE FABRIC INTO THE 6-INCH DEEP TRENCH, EXTENDING THE REMAINING 6-INCHES TOWARDS THE UPSLOPE SIDE OF THE TRENCH. BACKFILL THE TRENCH WITH SOIL OR GRAVEL AND COMPACT. BURY 12-INCHES OF FABRIC INTO THE GROUND WHEN PNEUMATICALLY INSTALLING SILT FENCE WITH A SLICING METHOD. PURCHASE FABRIC IN CONTINUOUS ROLLS AND CUT TO THE LENGTH OF THE BARRIER TO AVOID JOINTS. WHEN JOINTS ARE NECESSARY, WRAPPED THE FABRIC TOGETHER AT A SUPPORT POST WITH BOTH ENDS FASTENED TO THE POST, WITH A 6-INCH MINIMUM OVERLAP. INSTALL POSTS TO A MINIMUM DEPTH OF 24-INCHES. INSTALL POSTS A MINIMUM OF 1- TO 2- INCHES ABOVE THE FABRIC, WITH NO MORE THAN 3-FEET OF THE POST ABOVE THE GROUND. SPACE POSTS TO MAXIMUM 6-FEET CENTERS. ATTACH FABRIC TO WOOD POSTS USING STAPLES MADE OF HEAVY-DUTY WIRE AT LEAST 1-1/2-INCH LONG, SPACED A MAXIMUM OF 6-INCHES APART. STAPLE A 2-INCH WIDE LATHE OVER THE FILTER FABRIC TO SECURELY FASTEN IT TO THE UPSLOPE SIDE OF WOODEN POSTS. ATTACH FABRIC TO THE STEEL POSTS USING HEAVY-DUTY PLASTIC TIES THAT ARE EVENLY SPACED AND PLACED IN A MANNER TO PREVENT SAGGING OR TEARING OF THE FABRIC. IN CALL CASES, TIES SHOULD BE AFFIXED IN NO LESS THAN 4 PLACES. INSTALL THE FABRIC A MINIMUM OF 24-INCHES ABOVE THE GROUND. WHEN NECESSARY, THE HEIGHT OF THE FENCE ABOVE GROUND MAY BE GREATER THAN 24-INCHES. IN TIDAL AREAS, EXTRA SILT FENCE HEIGHT MAY BE REQUIRED. THE POST HEIGHT WILL BE TWICE THE EXPOSED POST HEIGHT. POST SPACING WILL REMAIN THE SAME AND EXTRA HEIGHT FABRIC WILL BE 4-, 5-, OR 6-FEET TALL. LOCATE SILT FENCE CHECKS EVERY 100 FEET MAXIMUM AND AT LOW POINTS. INSTALL THE FENCE PERPENDICULAR TO THE DIRECTION OF FLOW AND PLACE THE FENCE THE PROPER DISTANCE FROM THE TOE OF STEEP SLOPES TO PROVIDE SEDIMENT STORAGE AND ACCESS FOR MAINTENANCE AND CLEANOUT.

INSPECTION AND MAINTENANCE:
CHECK FOR SEDIMENT BUILDUP AND FENCE INTEGRITY. CHECK WHERE RUNOFF HAS ERODED A CHANNEL BENEATH THE FENCE, OR WHERE THE FENCE HAS SAGGED OR COLLAPSED BY FENCE OVERTOPPING. IF THE FENCE FABRIC TEARS, BEGINS TO DECOMPOSE, OR IN ANY WAY BECOMES INEFFECTIVE, REPLACE THE SECTION OF FENCE IMMEDIATELY. REMOVE SEDIMENT ACCUMULATED ALONG THE FENCE WHEN IT REACHES 1/3 THE HEIGHT OF THE FENCE, ESPECIALLY IF HEAVY RAINS ARE EXPECTED. REMOVE TRAPPED SEDIMENT FROM THE SITE OR STABILIZE IT ON SITE. REMOVE SILT FENCE WITHIN 30 DAYS AFTER FINAL STABILIZATION IS ACHIEVED OR

AFTER TEMPORARY BEST MANAGEMENT PRACTICES (BMPS) ARE NO LONGER NEEDED. PERMANENTLY STABILIZE DISTURBED AREAS RESULTING FROM FENCE REMOVAL.

SILT FENCE
NOT TO SCALE

SINGLE ROW

DOUBLE ROW

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARON 12/5/2025

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

THOMAS & HUTTON

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

SWPPP DETAILS

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

50 0 25 50
GRAPHIC SCALE:
1 INCH = 50 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/11/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	1" = 50'

EC4.2

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SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2025

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UTILITY RELOCATION OVERALL

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

200 0 100 200
GRAPHIC SCALE:
1 INCH = 200 FEET

200 0 100 200
GRAPHIC SCALE:
1 INCH = 200 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

UT1.0

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 18837
RICHARD PETER KARDOS
12/5/2024

SOUTH CAROLINA
THOMAS & HUTTON ENGINEERING CO.
No. C00265
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UTILITY RELOCATION

WATERWAY BLVD PATHWAY

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ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

20 0 10 20
GRAPHIC SCALE:
1 INCH = 20 FEET

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GRAPHIC SCALE:
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UT1.1

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 18837
RICHARD PETER KARCH
11/12/2024

SOUTH CAROLINA
THOMAS & HUTTON ENGINEERING CO.
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UTILITY RELOCATION

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SCALE:	SEE SCALE BAR

UT1.2

Z:\27670\27670.0010\CONSTRUCTION\DRAWINGS\CONSTRUCTION PLANS\27670.0010 - UTILITY RELOCATIONS - Dec 5, 2023 - 10:38 PM

MATCH LINE -- SEE SHEET NO. UT1.2

ENSIGN COURT
50' R/W

WATERWAY BLVD
60' R/W

29TH AVE
60' R/W

30TH AVE
(SC 918) 60' R/W

MATCH LINE -- SEE SHEET NO. UT1.4

1 ENSIGN CT

2 ENSIGN CT

2800 WATERWAY BLVD

2802 WATERWAY BLVD

2804 WATERWAY BLVD

2900 WATERWAY BLVD

2903 WATERWAY BLVD

2905 WATER

3000 WATERWAY BLVD

3001 WATERWAY BLVD

3002 WATERWAY BLVD

3003 WATERWAY BLVD

3004 WATERWAY BLVD

3005 WATERWAY BLVD

3006 WATERWAY BLVD

3007 WATERWAY BLVD

3009 WATERWAY BLVD

3011 WATERWAY BLVD

3013 WATERWAY BLVD

3015 WATERWAY BLVD

PRES. 25' R/W (P.B. C8, PG. 122)

PRES. 30' R/W (FILE 10.545) (P.B. BB, PG. 20)

PRES. 30' R/W (FILE 10.545) (P.B. T, PG. 97)

PRES. 30' R/W (FILE 10.545) (P.B. S, PG. 107)

PRES. 30' R/W (FILE 10.545) (P.B. X, PG.

PRES. 30' R/W (FILE 10.469) (P.B. BB, PG. 20)

PRES. 30' R/W (FILE 10.469) (P.B. X, PG. 13)

18" CONCRETE RING TO BE POURED AROUND RIM OF SEWER MANHOLE

COORDINATE WITH UTILITY OWNER TO RELOCATE COMMUNICATION STRUCTURE

COORDINATE WITH UTILITY OWNER TO RELOCATE COMMUNICATION STRUCTURES

SSMH FR: 8.02

SSMH FR: 7.28 BOX: (-)3.00

SSMH FR: 7.11 NO ACCESS

SSMH FR: 6.73 BOX: (-)0.50

TMS# 571-05-00-196 ANTOINE MAKHLOUTA & KATHLEEN ELLEN ASHTON

TMS# 571-05-00-197 CITY OF I.O.P. COMM OF PUBLIC WORKS

TMS# 571-05-00-198 ISLE OF PALMS WATER AND SEWER COMMISSION

TMS# 571-05-00-199 CITY OF I.O.P. COMM OF PUBLIC WORKS

TMS# 571-05-00-173 JAMES DONALD REID

TMS# 571-06-00-148 RICHARD W. RISSMILLER, JR. & ANDREA M. RINN

TMS# 571-06-00-147 SWA PARTNERS LLC

TMS# 571-06-00-146 JOHN A. & CLAUDETTE B. STICK

TMS# 571-06-00-149 MICHAEL & JILL BRIGHT

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARDOS 12/5/2023

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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UTILITY RELOCATION

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

20 0 10 20
GRAPHIC SCALE:
1 INCH = 20 FEET

20 0 10 20
GRAPHIC SCALE:
1 INCH = 20 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/11/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

UT1.3

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 16837
RICHARD PETER KARON
12/5/2024

SOUTH CAROLINA
CERTIFICATE OF AUTHORIZATION
THOMAS & HUTTON ENGINEERING CO.
No. C00265

THOMAS & HUTTON

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UTILITY RELOCATION

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GRAPHIC SCALE:
1 INCH = 20 FEET

20 0 10 20
GRAPHIC SCALE:
1 INCH = 20 FEET

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JOB NO:	27670.0010
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APPROVED:	RPK
SCALE:	SEE SCALE BAR

UT1.4

Z:\27670\27670.001\CONSTRUCTION\DRAWINGS\CONSTRUCTION PLANS\27670.001 - UTILITY RELOCATION - Dec 5, 2025 - 10:38 PM

WATERWAY BLVD

TMS# 571-06-00-126
LINDA J. BRADLEY

PRES. 30' R/W (FILE 10.604) (P.B. BB, PG. 20)

18" CONCRETE RING TO BE POURED AROUND RIM OF SEWER MANHOLE

3401 WATERWAY BLVD

SSMH
FR: 5.60
BOX: (-) 53

WATERWAY BLVD
60' R/W

SSMH
FR: 5.57

PRES. 30' R/W (FILE 10.604) (P.B. X, PG. 139)

OAKVIEW LN
50' R/W

PRES. VAR. R/W (P.B. X, PG. 139)

3402 WATERWAY BLVD

3404 WATERWAY BLVD

TIMBER LN
50' R/W

3500 WATERWAY BLVD

3400 WATERWAY BLVD

SSMH
FR: 6.05
BOX: (-) 59

SSMH
SSMH 4
FR: 6.20

18" CONCRETE RING TO BE POURED AROUND RIM OF SEWER MANHOLE

IE 6"PVC @ 2.93'
IE 10" @ 1.01'

CONTRACTOR TO FIELD VERIFY DEPTH OF EXST. 8" SEWER MAIN. SEWER MAIN SHALL BE SLEEVED IN 16" STEEL CASING THROUGH PROPOSED CONFLICT STRUCTURE.

3605 WATERWAY

PRES. 30' R/W (FILE 10.604) (P.B. BB, PG. 20)

WATERWAY BLVD
60' R/W

FOREST TRAIL
50' R/W

PRES. 30' R/W (FILE 10.604) (P.B. X, PG. 139)

3600 WATERWAY BLVD

3602 WATERWAY BLVD

PRES. 30' R/W (FILE 10.604) (P.B. AB, PG. 22)

3604 WATERWAY BLVD

3606 WATERWAY BLVD

TMS# 571-07-00-165
PAT R. ROSS & THOMAS SWINGLE, IV.
CHRISTA SWINGLE

MATCH LINE - SEE SHEET NO. UT1.6

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 18837
RICHARD PETER KARG
12/5/2025

SOUTH CAROLINA
THOMAS & HUTTON ENGINEERING CO.
No. C00265
CERTIFICATE OF AUTHORIZATION

THOMAS & HUTTON

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

UTILITY RELOCATION

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

20 0 10 20
GRAPHIC SCALE:
1 INCH = 20 FEET

20 0 10 20
GRAPHIC SCALE:
1 INCH = 20 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/11/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

UT1.5

Z:\27670\27670.0010\CONSTRUCTION PLANS\UTILITY RELOCATION PLANS\27670.0010 - UTILITY RELOCATION PLANS - Dec 5, 2025 - 10:38 PM

MATCH LINE – SEE SHEET NO. UT1.5

18" CONCRETE RING TO BE POURED AROUND RIM OF SEWER MANHOLE

18" CONCRETE RING TO BE POURED AROUND RIM OF SEWER MANHOLE

CONTRACTOR TO FIELD VERIFY DEPTH OF EXST. 8" SEWER MAIN. SEWER MAIN SHALL BE SLEEVED IN 16" STEEL CASING THROUGH PROPOSED CONFLICT STRUCTURE.

18" CONCRETE RING TO BE POURED AROUND RIM OF SEWER MANHOLE

WATERWAY BLVD
60' R/W

INTRACOASTAL COURT
60' R/W

SPARROW DR
(SC 1998) 50'

3605 WATERWAY BLVD
3606 WATERWAY BLVD
3607 WATERWAY BLVD
3608 WATERWAY BLVD
3609 WATERWAY BLVD
3610 WATERWAY BLVD
3611 WATERWAY BLVD
3612 WATERWAY BLVD
3613 WATERWAY BLVD
3615 WATERWAY BLVD
4000 WATERWAY BLVD
4003 WATERWAY BLVD
3906 WATERWAY BLVD
2 INTRACOASTAL CT

PRES. 30' R/W (FILE 10.604) (P.B. BB, PG. 20)
PRES. 30' R/W (FILE 10.604) (P.B. AB, PG. 22)
PRES. 30' R/W (FILE 10.604) (P.B. AB, PG. 100)
PRES. 30' R/W (P.B. CH, PG. 81)
PRES. 40' R/W (FILE 10.604) (P.B. BB, PG. 20)

TMS# 571-07-00-165 CHRISTOPHER SWINGLE, IV. AND KRISTA SWINGLE
TMS# 571-07-00-164 SRINIVAS MANGIPUDI
TMS# 571-07-00-162 JOHN M. AND LYNN Z. GARLAND
TMS# 571-07-00-161 BRIAN J. DUFFY, REV TRUST & CATHERINE L. MALLORY, REV TRUST
TMS# 571-07-00-160 KAREN CLARK, A REV. TRUST
TMS# 571-07-00-159 JOHN S. & DONNA G. BRENNER
TMS# 571-07-00-112 ALEX CALHOUN STRANGE
TMS# 571-07-00-113 4001 WATERWAY LLC

CURB INLET FR.: 4.92 BOX: 1.17 IE 18"RCP (E): 1.31
CURB INLET FR.: 4.98 BOX: 0.23 IE 18"RCP (W): 1.14
SSMH FR: 5.08 BOX: 4.1
SSMH FR: 5.21 BOX: 1.92
SSMH FR: 4.69 NO ACCESS
SSMH FR: 4.92 BOX: 2.12
SSMH FR: 5.03 BOX: 1.55
24"RCP IE: 0.13
SD MANHOLE FR: 4.44 NO ACCESS
24"RCP IE: 0.63

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARO 12/5/2025

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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UTILITY RELOCATION

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

GRAPHIC SCALE: 1 INCH = 20 FEET (20 0 10 20)

GRAPHIC SCALE: 1 INCH = 20 FEET (20 0 10 20)

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
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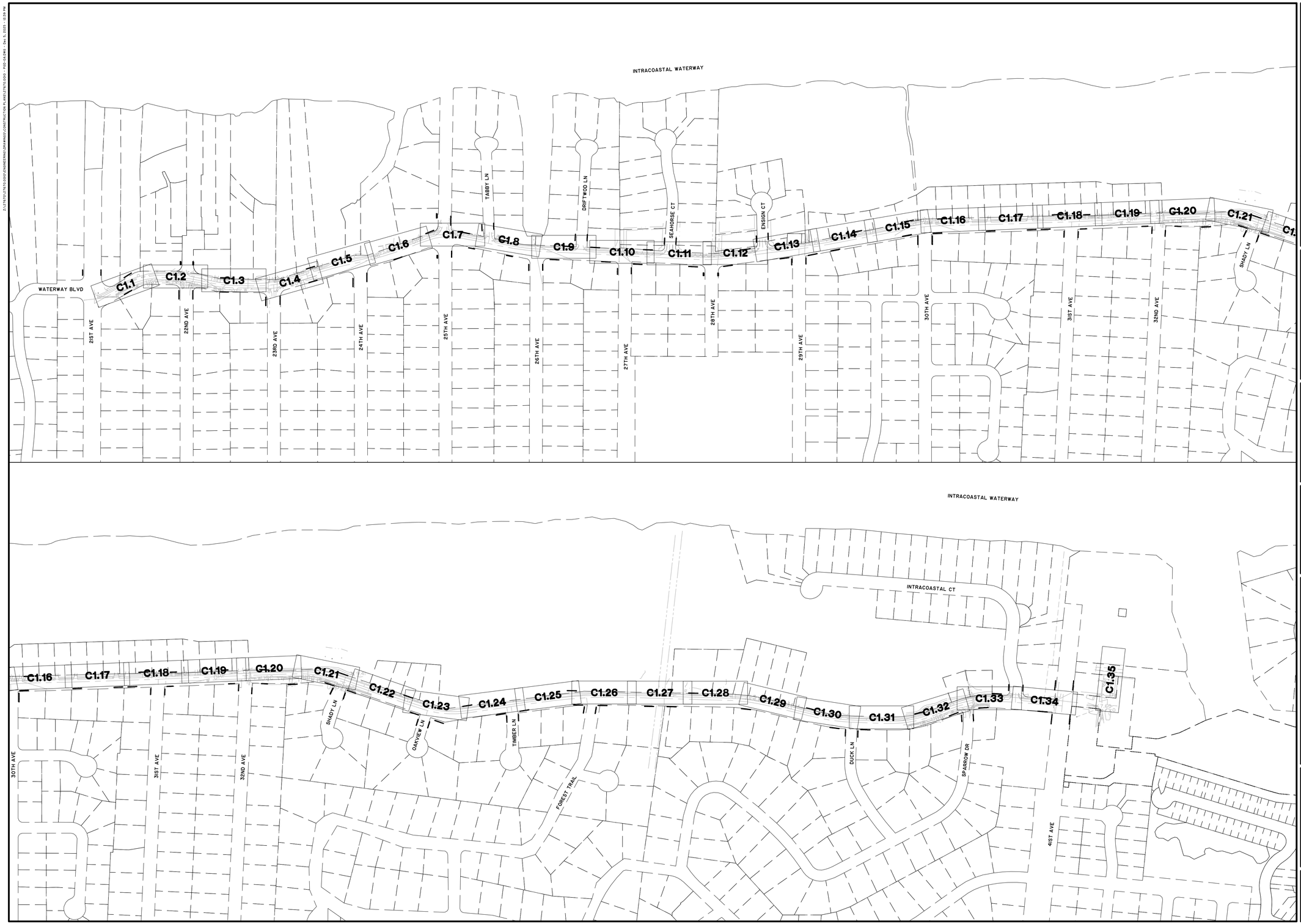
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

UT1.6

Z:\27670\1.27670\DOD\ENGINEERING\DRAINAGE\CONSTRUCTION PLANS\27670.DWG - Plot by MCV - Dec 5, 2025 - 10:39 PM



NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2025

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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PAVING, GRADING, & DRAINAGE SHEET INDEX

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

200 0 100 200
GRAPHIC SCALE:
1 INCH = 200 FEET

200 0 100 200
GRAPHIC SCALE:
1 INCH = 200 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
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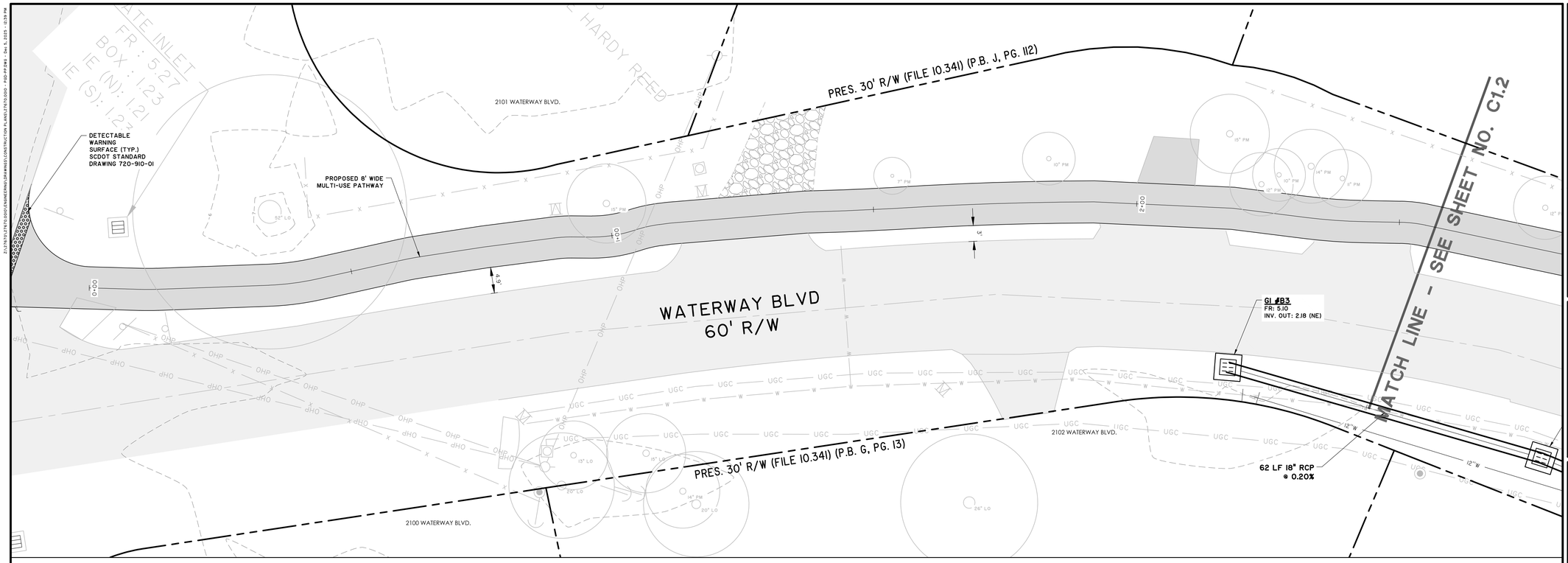
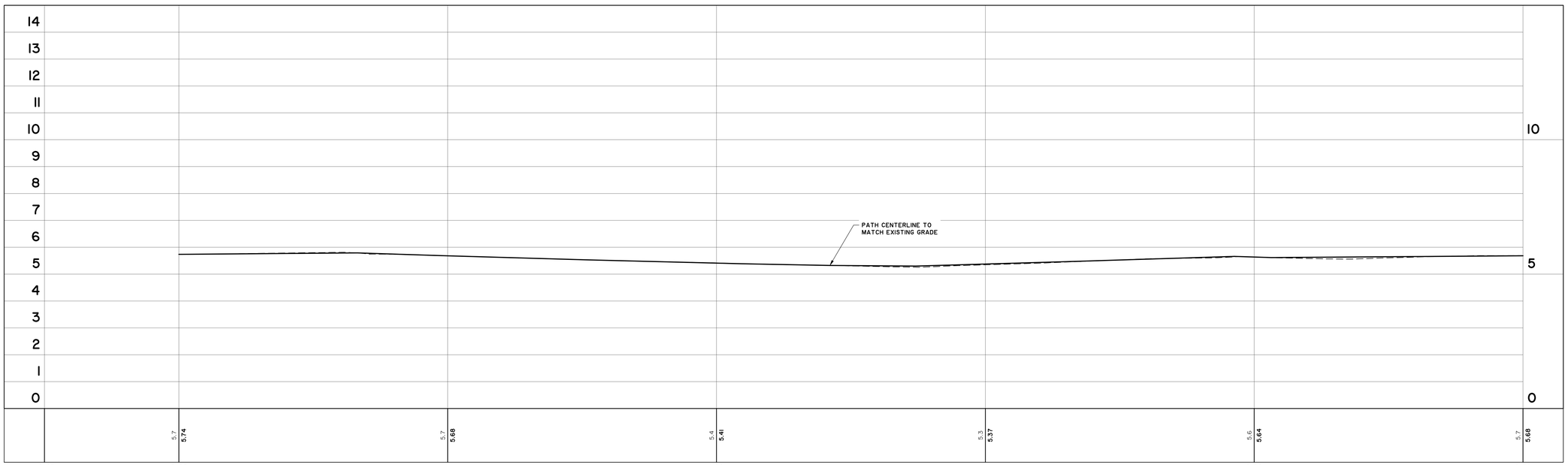
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.0





27670.0010 – Proposed Waterway Blvd
STATIONS: -0+25 – 2+50
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER RICHARD PETER KARG No. 18837 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

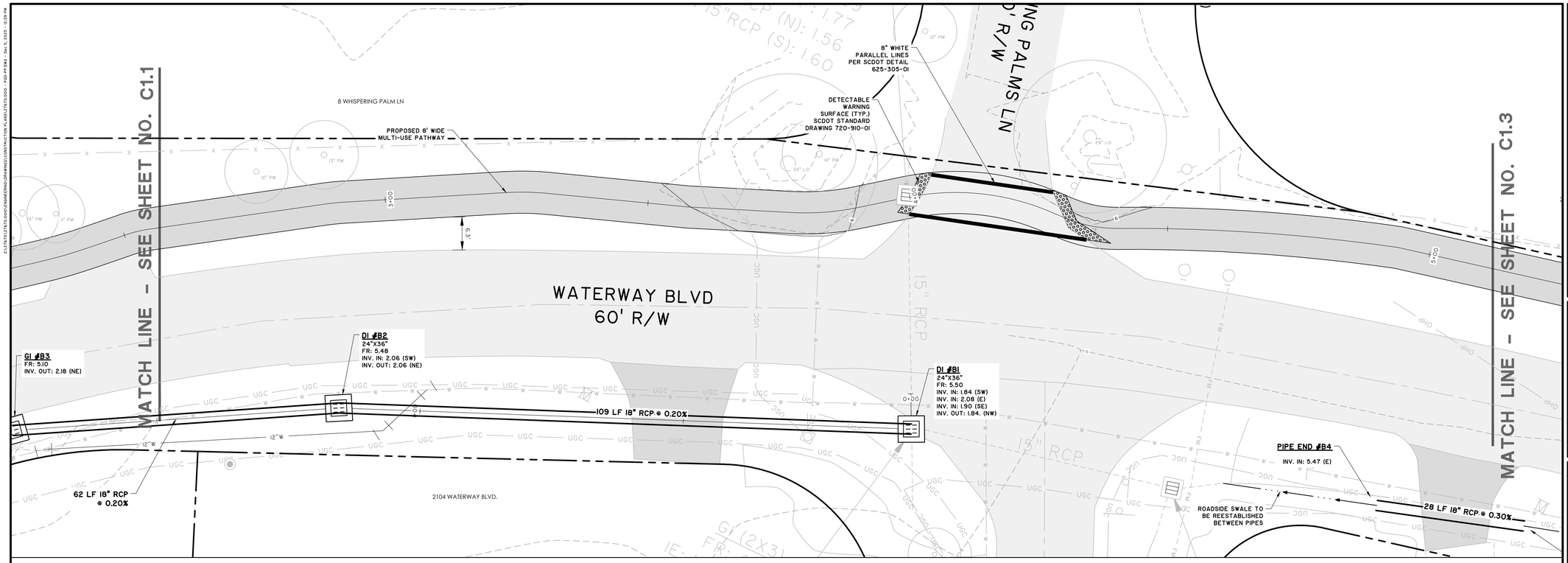
GRAPHIC SCALE: 1 INCH = 10 FEET

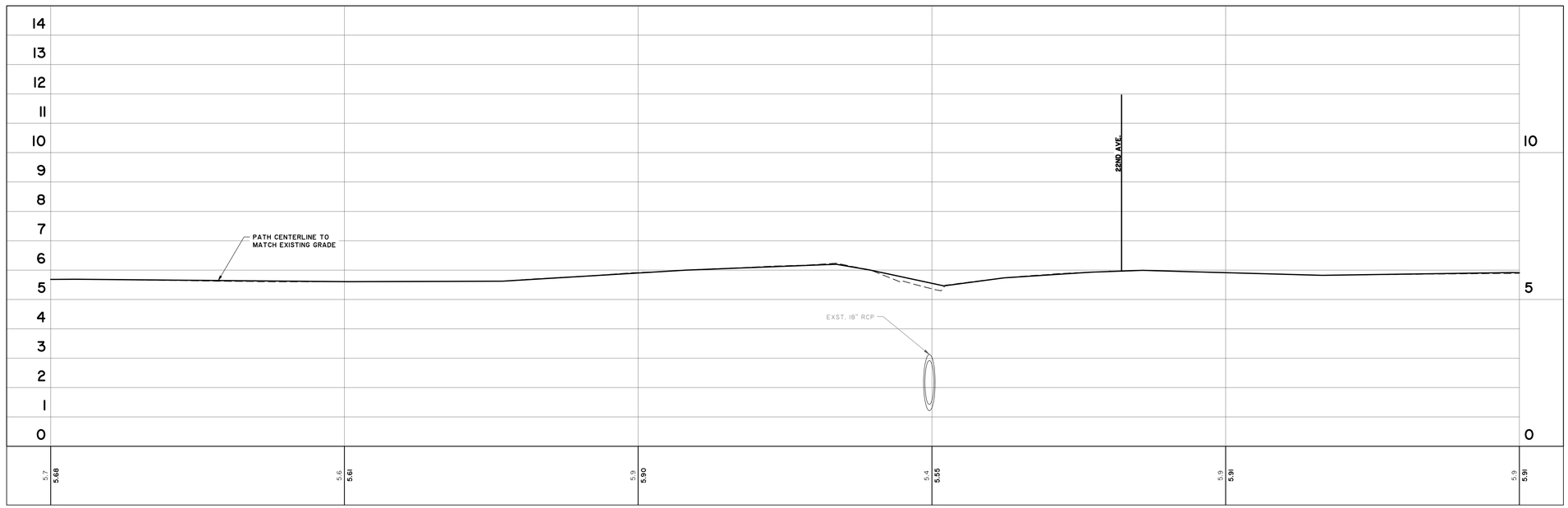
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/14/2024
DRAWN:	
DESIGNED:	
REVIEWED:	
APPROVED:	
SCALE:	SEE SCALE BAR

C1.1





27670.0010 – Proposed Waterway Blvd
STATIONS: 2+50 – 5+00
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARON 11/12/2024

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
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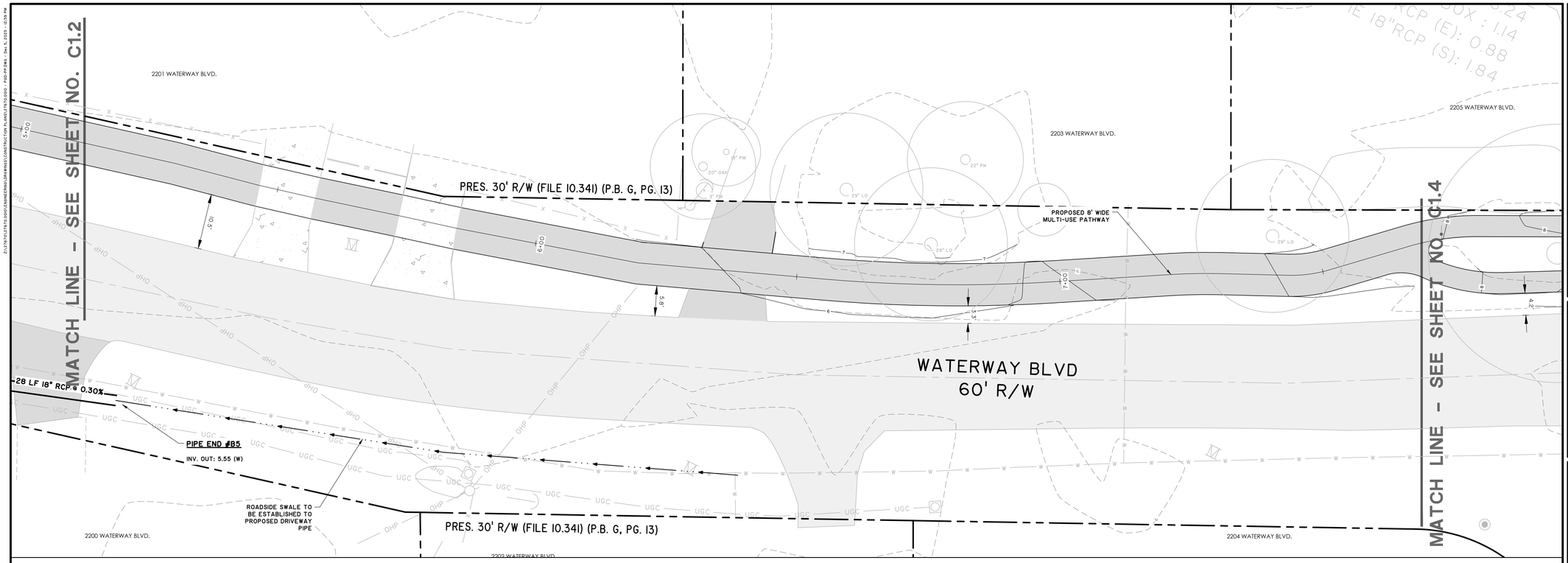
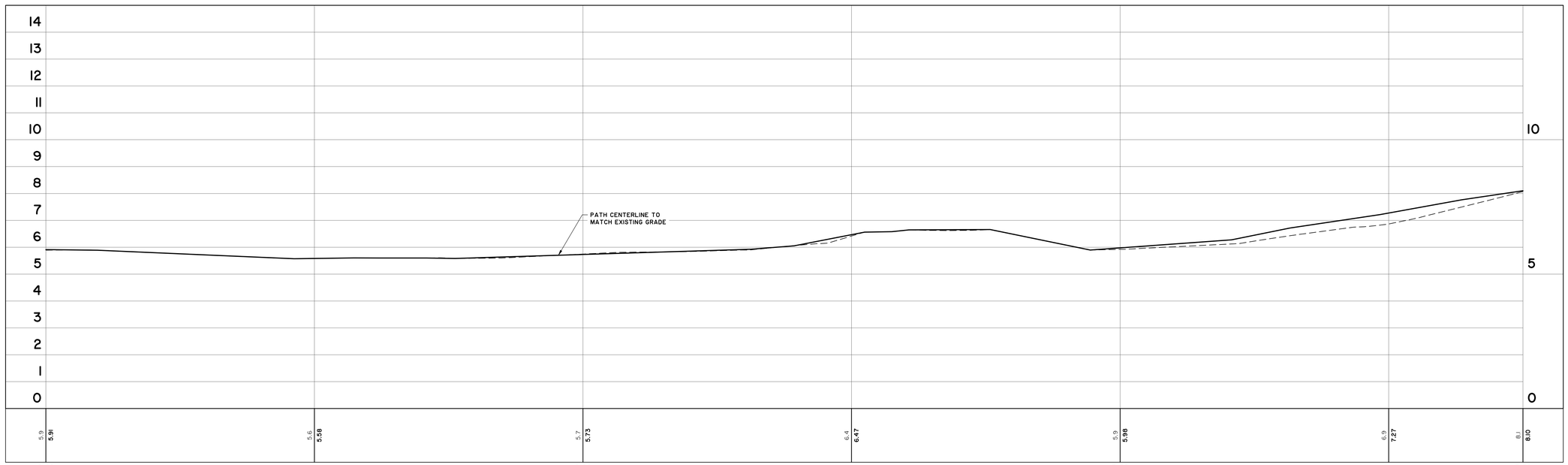
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.2





27670.0010 – Proposed Waterway Blvd
STATIONS: 5+00 – 7+75
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

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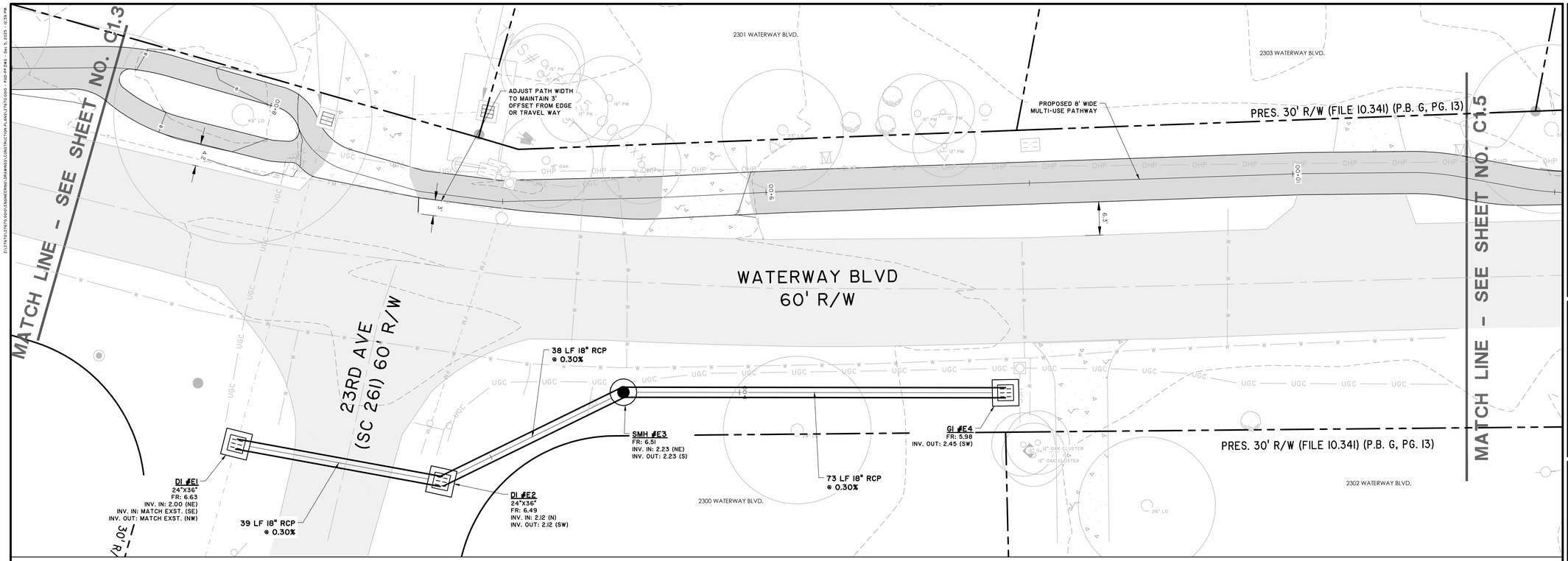
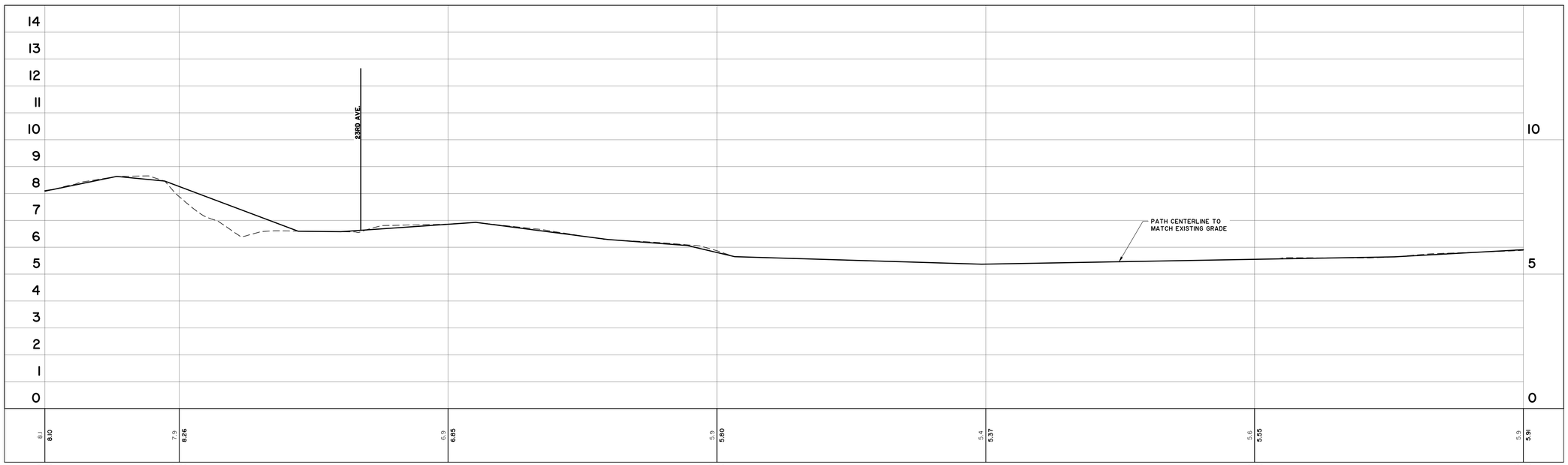
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.3





27670.0010 – Proposed Waterway Blvd
STATIONS: 7+75 – 10+50
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARKOW 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

GRAPHIC SCALE: 1 INCH = 10 FEET

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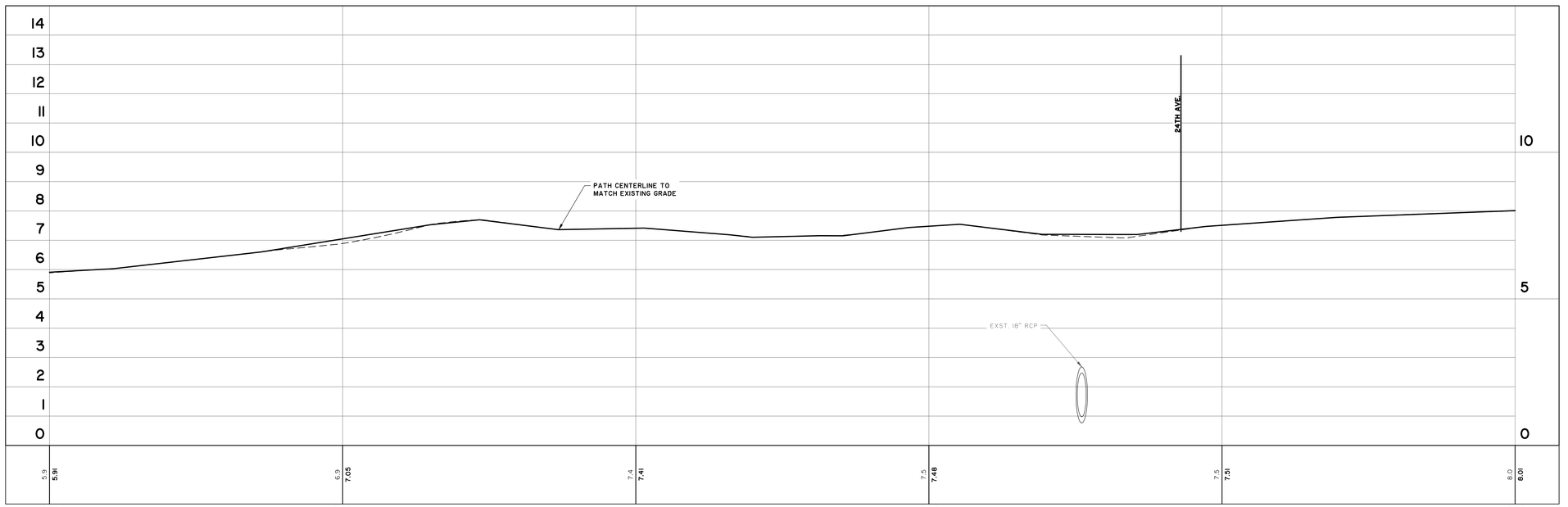
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.4



27670.0010 – Proposed Waterway Blvd
STATIONS: 10+50 – 13+00
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

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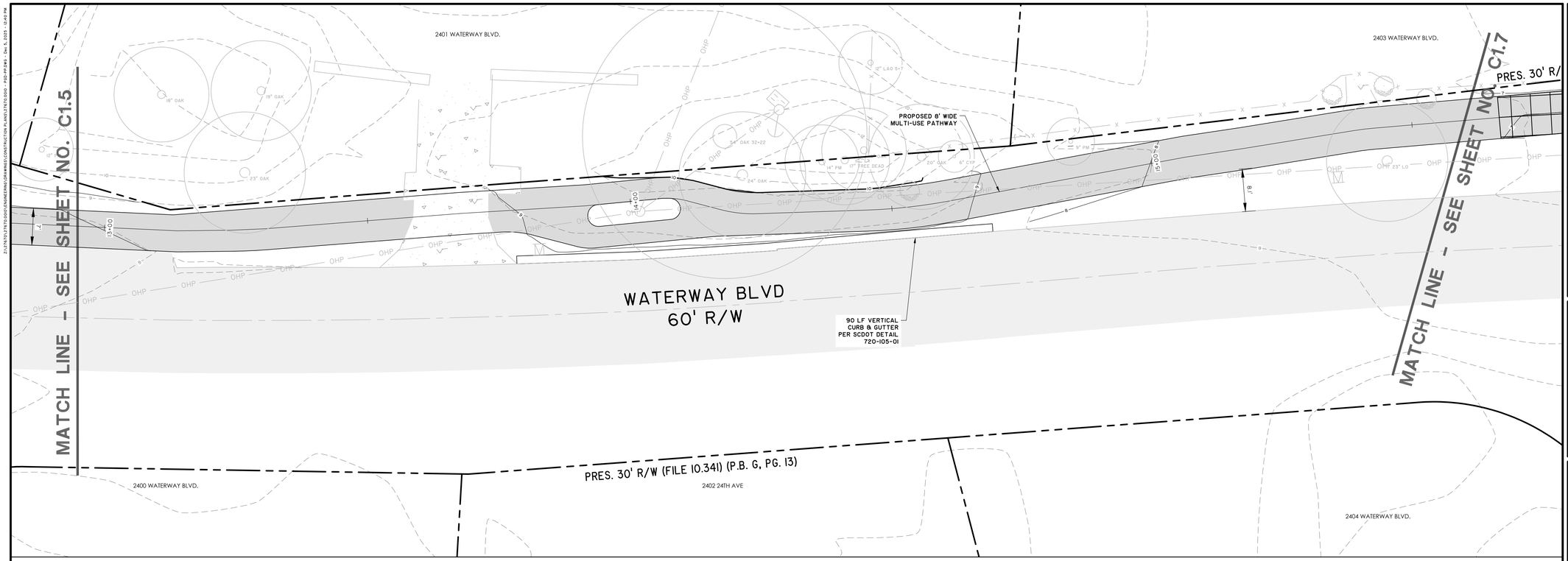
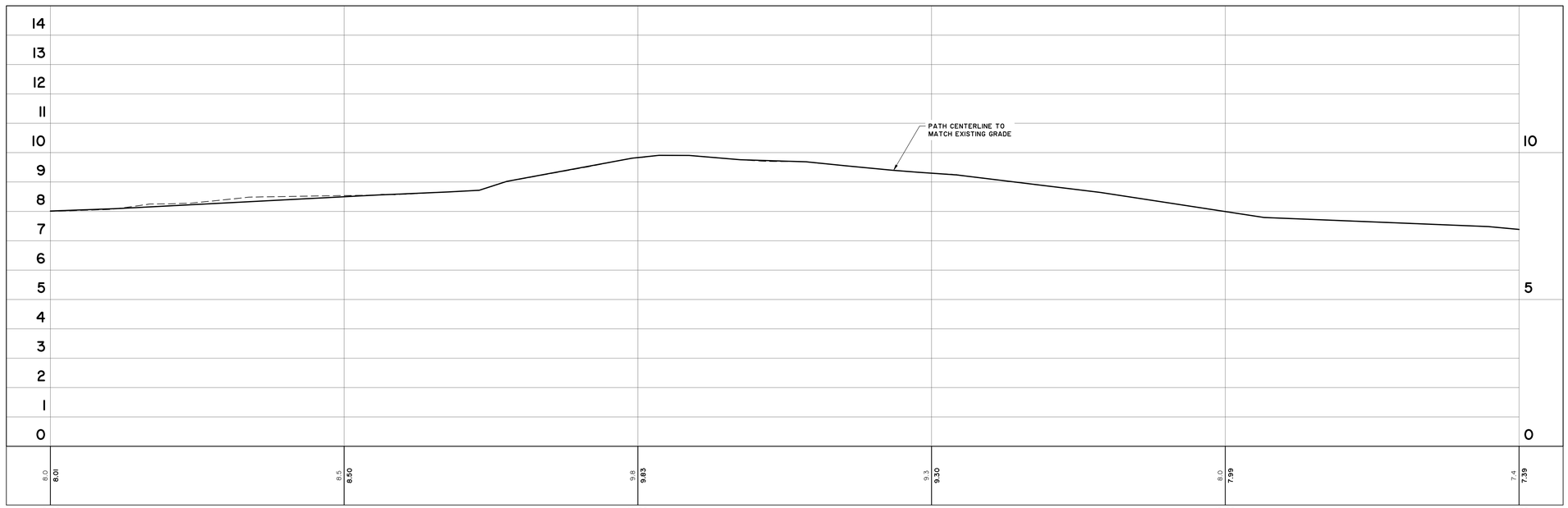
C1.5





27670.0010 – Proposed Waterway Blvd
STATIONS: 13+00 – 15+50
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 11/12/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
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P.O. DRAWER 508
ISLE OF PALMS, SC 29451

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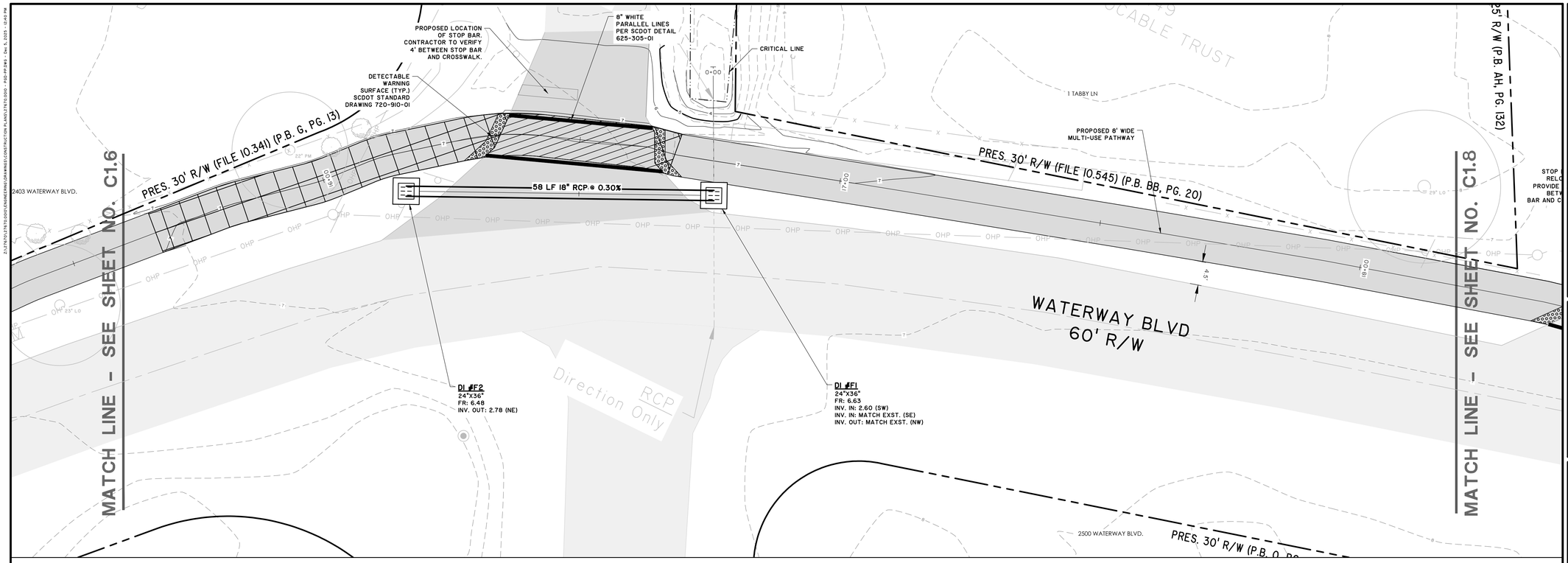
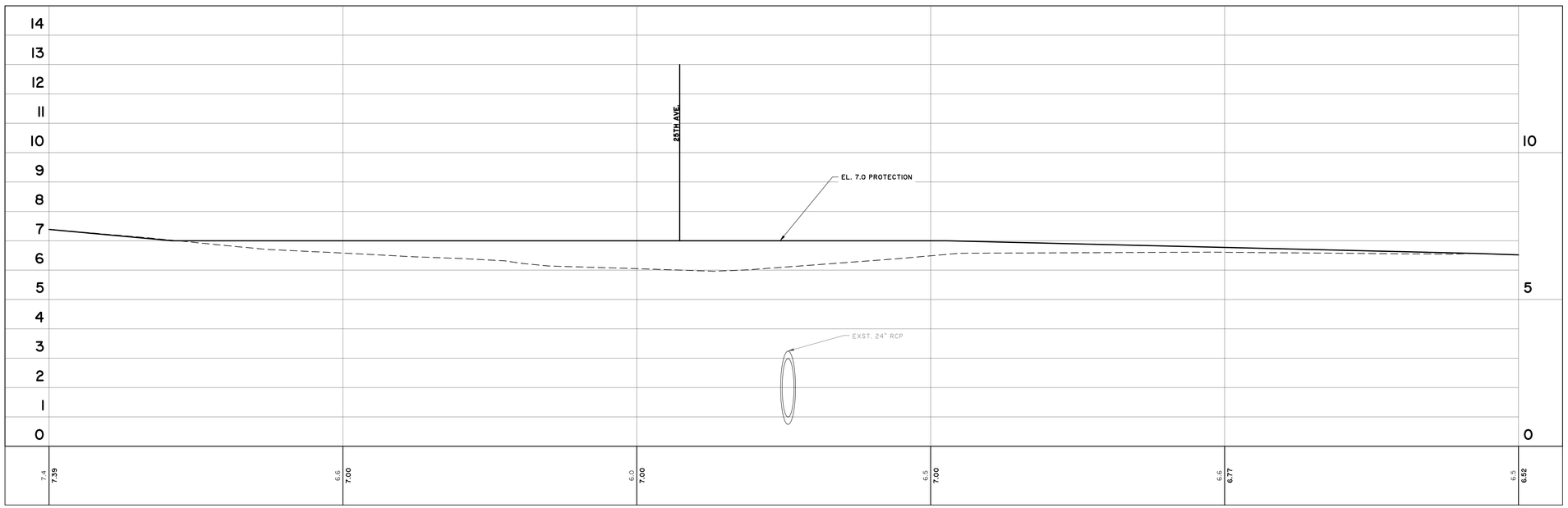
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.6





27670.0010 – Proposed Waterway Blvd
STATIONS: 15+50 – 18+00
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

LEGEND

- PATHWAY FILL
- ROAD REGRADE
- PATHWAY FILL - ONE WALL

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARWIN 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

GRAPHIC SCALE: 1 INCH = 10 FEET (10 0 5 10)
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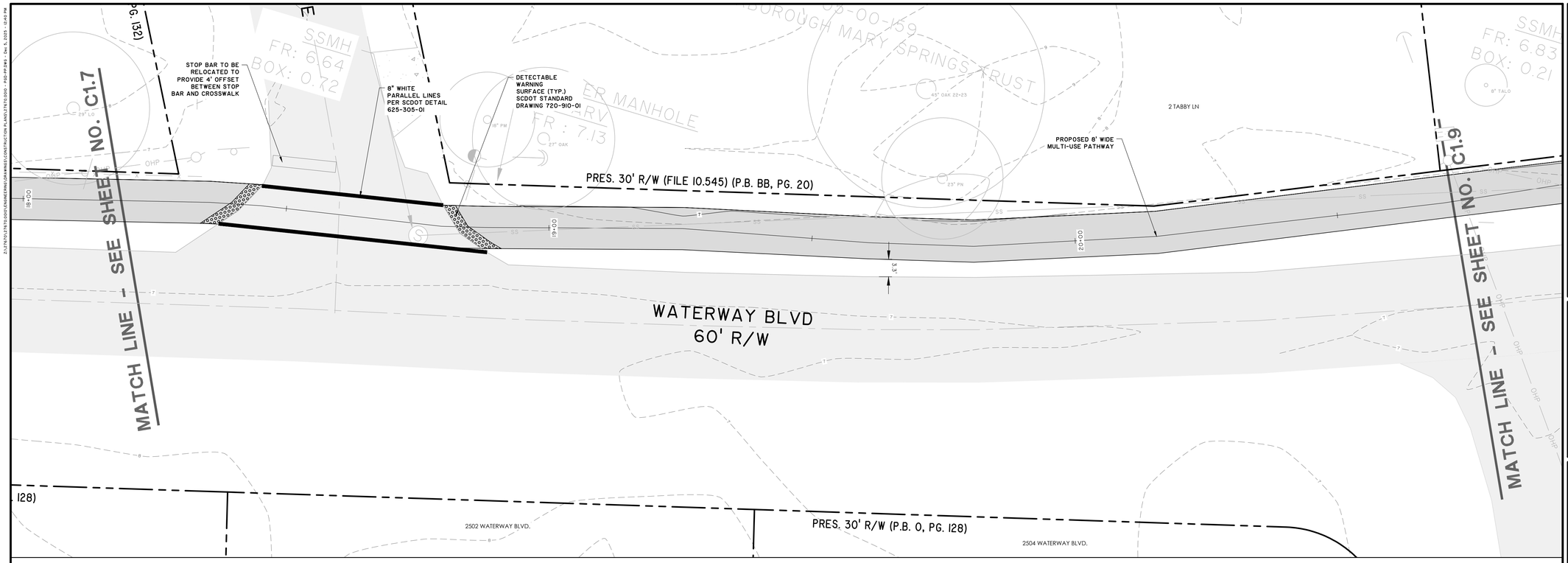
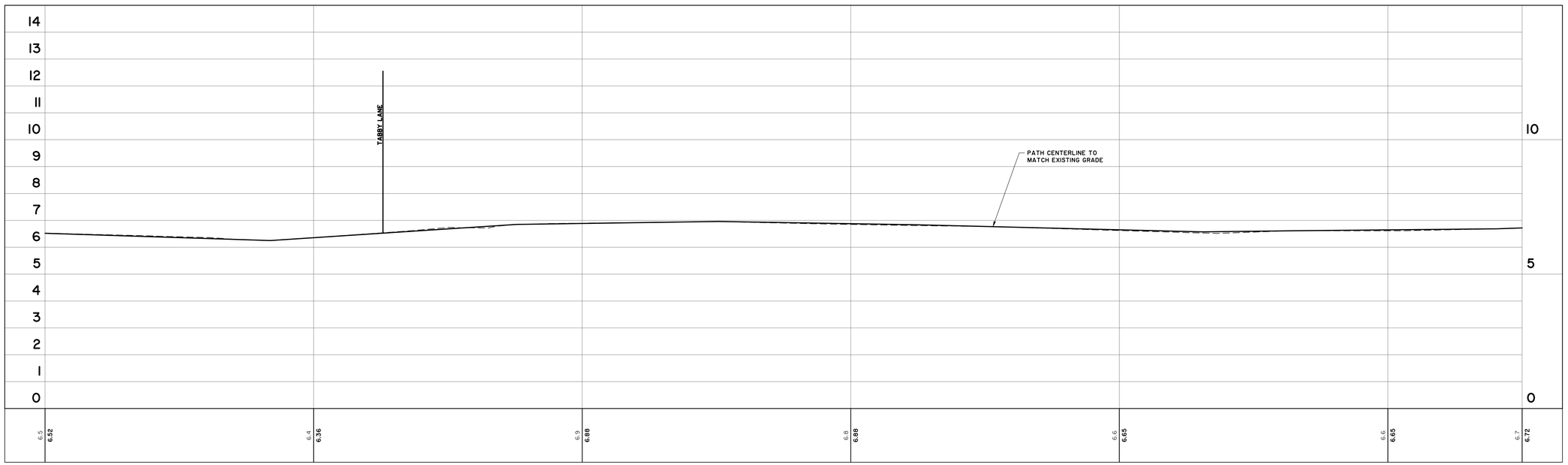
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.7





27670.0010 – Proposed Waterway Blvd
STATIONS: 18+00 – 20+75
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

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ISLE OF PALMS, SC 29451

GRAPHIC SCALE: 1 INCH = 10 FEET

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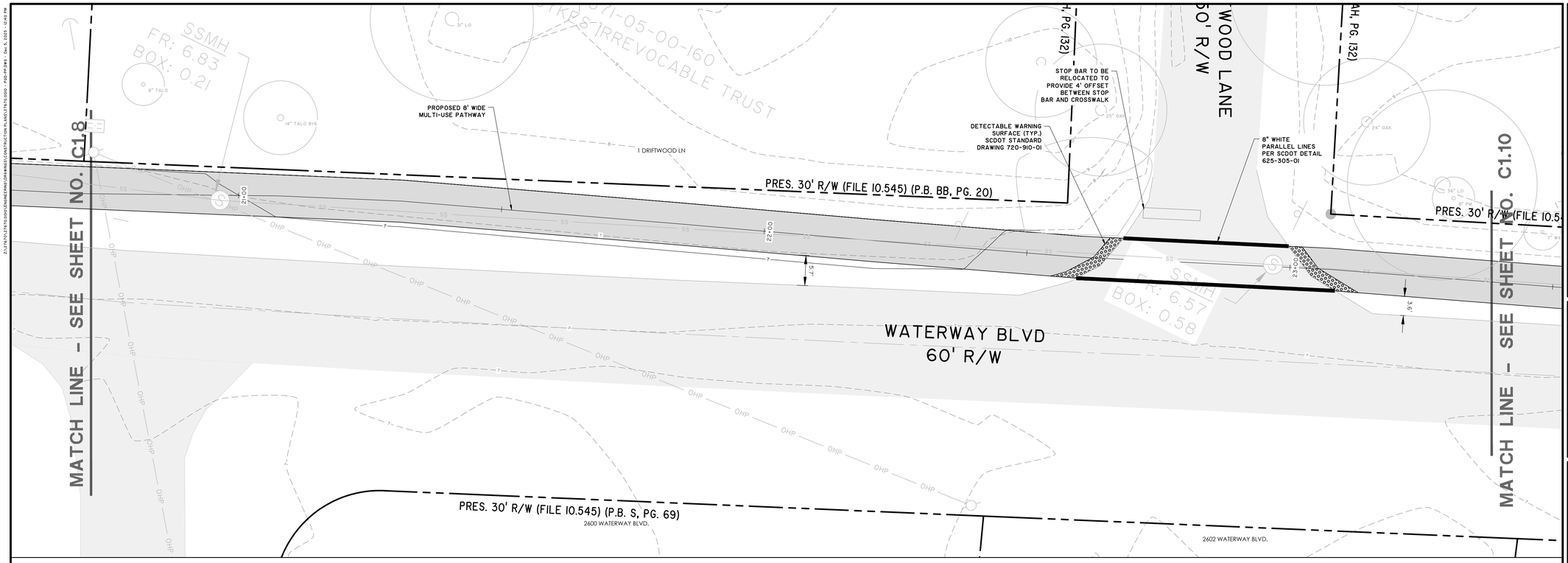
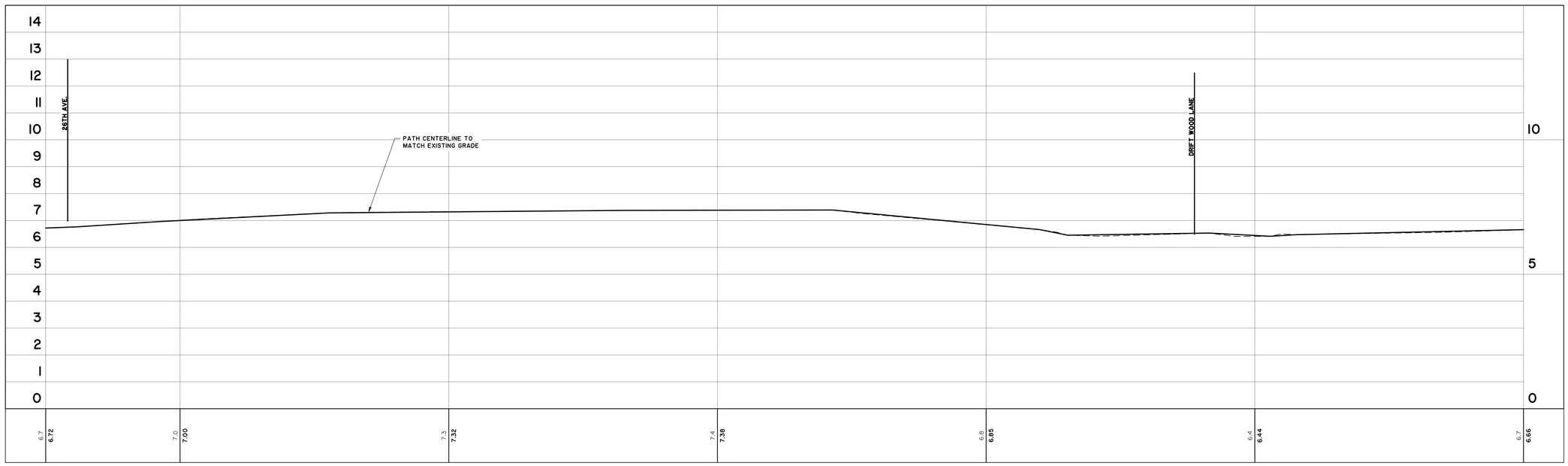
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.8





27670.0010 – Proposed Waterway Blvd

STATIONS: 20+75 – 23+50
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

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PLAN & PROFILE

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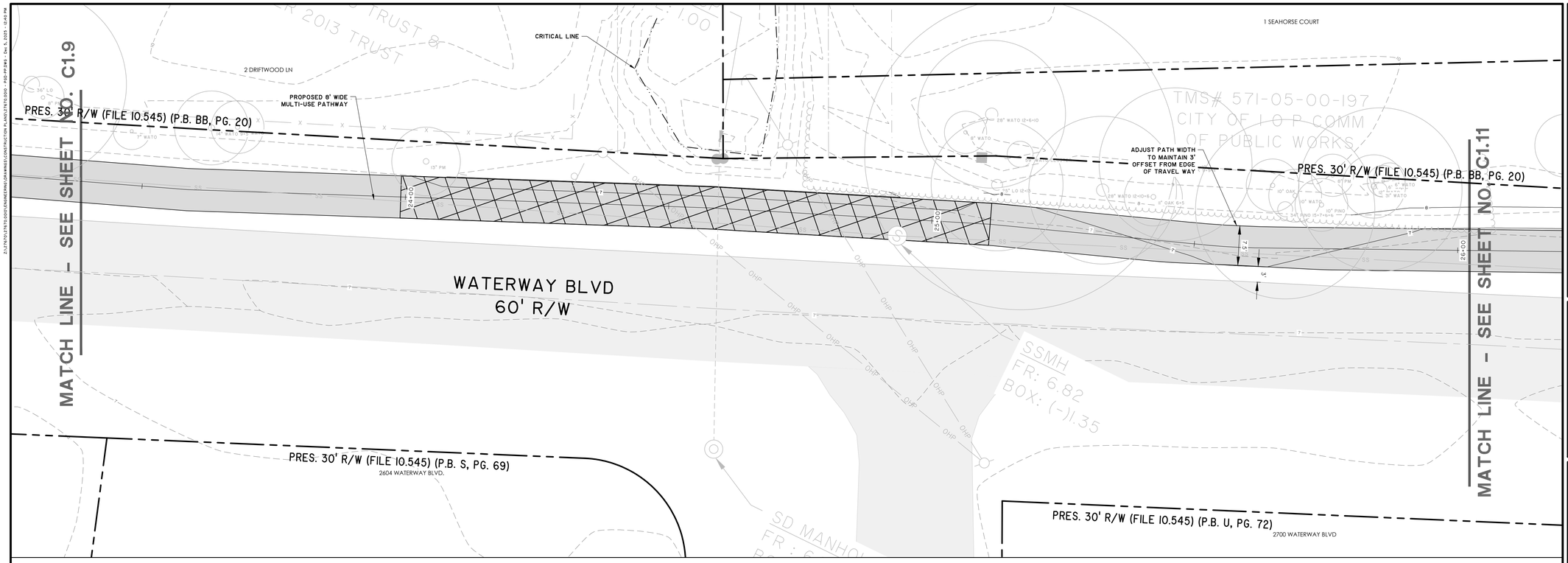
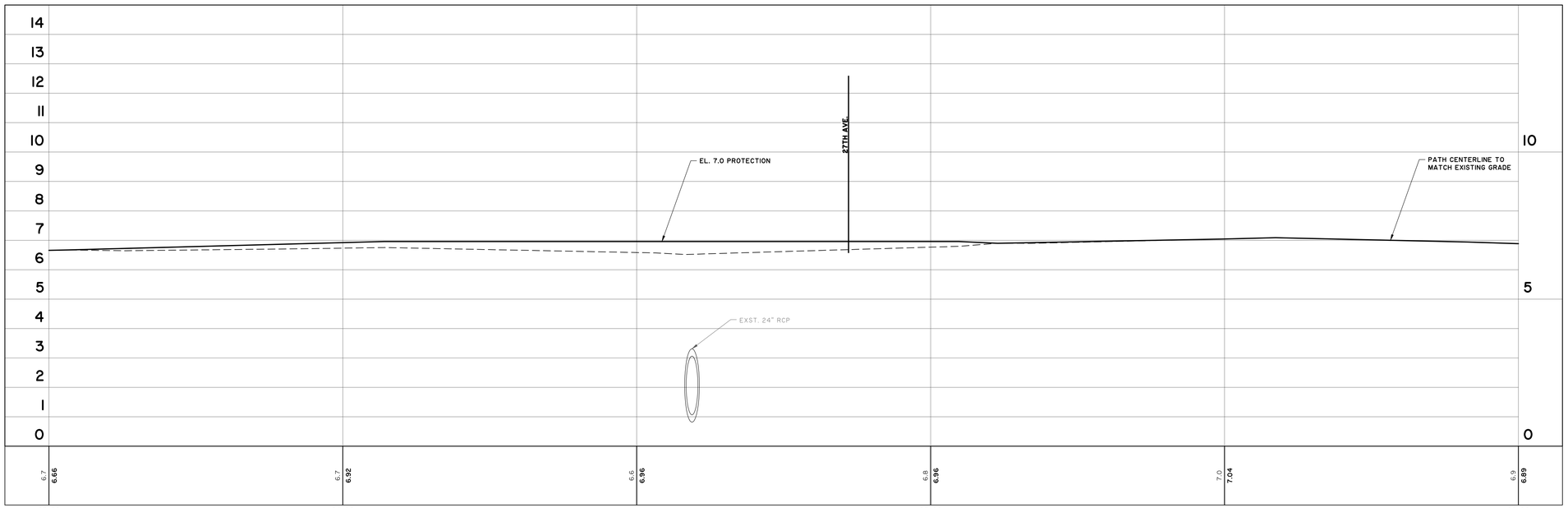
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.9





27670.0010 – Proposed Waterway Blvd
STATIONS: 23+50 – 26+00
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

LEGEND

- PATHWAY FILL
- ROAD REGRADE
- PATHWAY FILL - ONE WALL

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARKOW 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

THOMAS & HUTTON

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www.thomasandhutton.com

PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

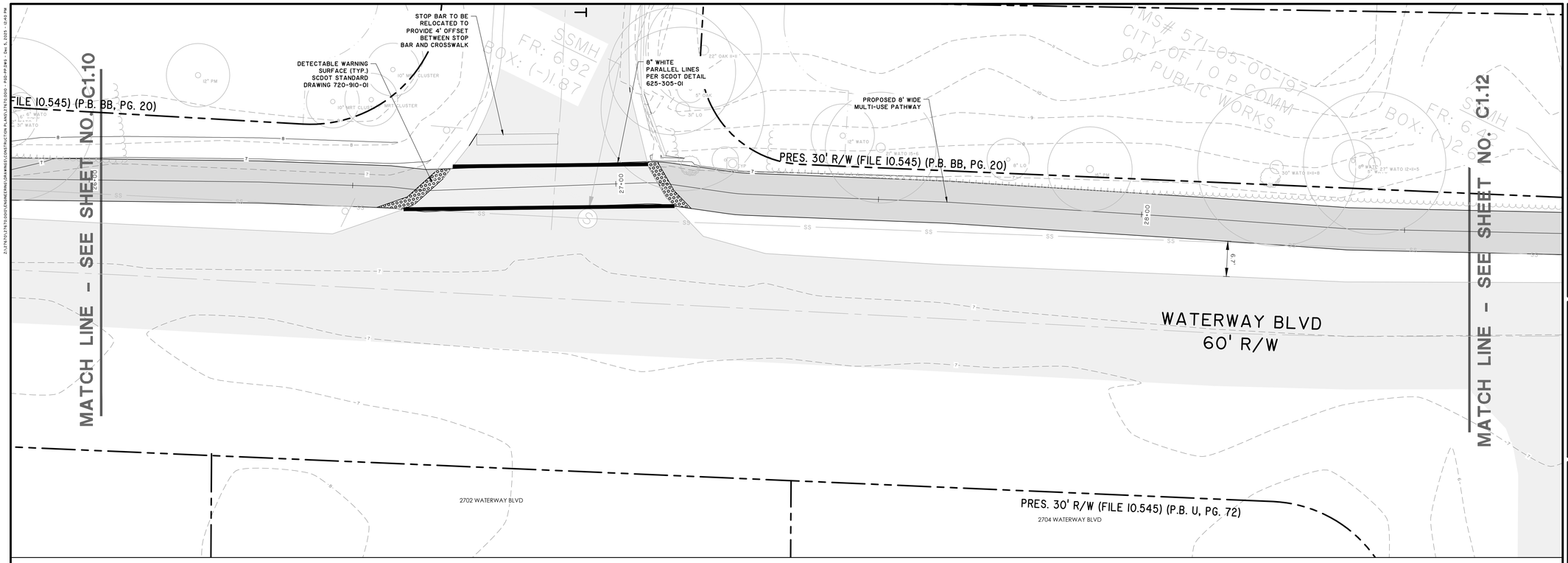
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

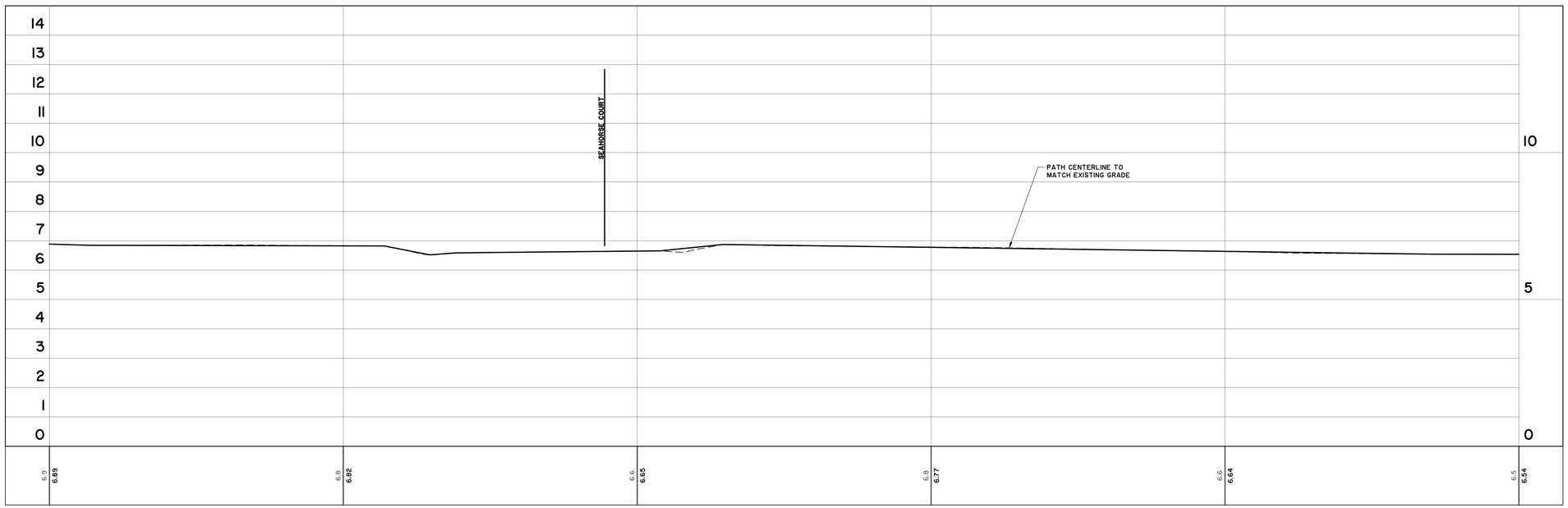
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.10





27670.0010 – Proposed Waterway Blvd
STATIONS: 26+00 – 28+50
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARON 12/5/2024

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

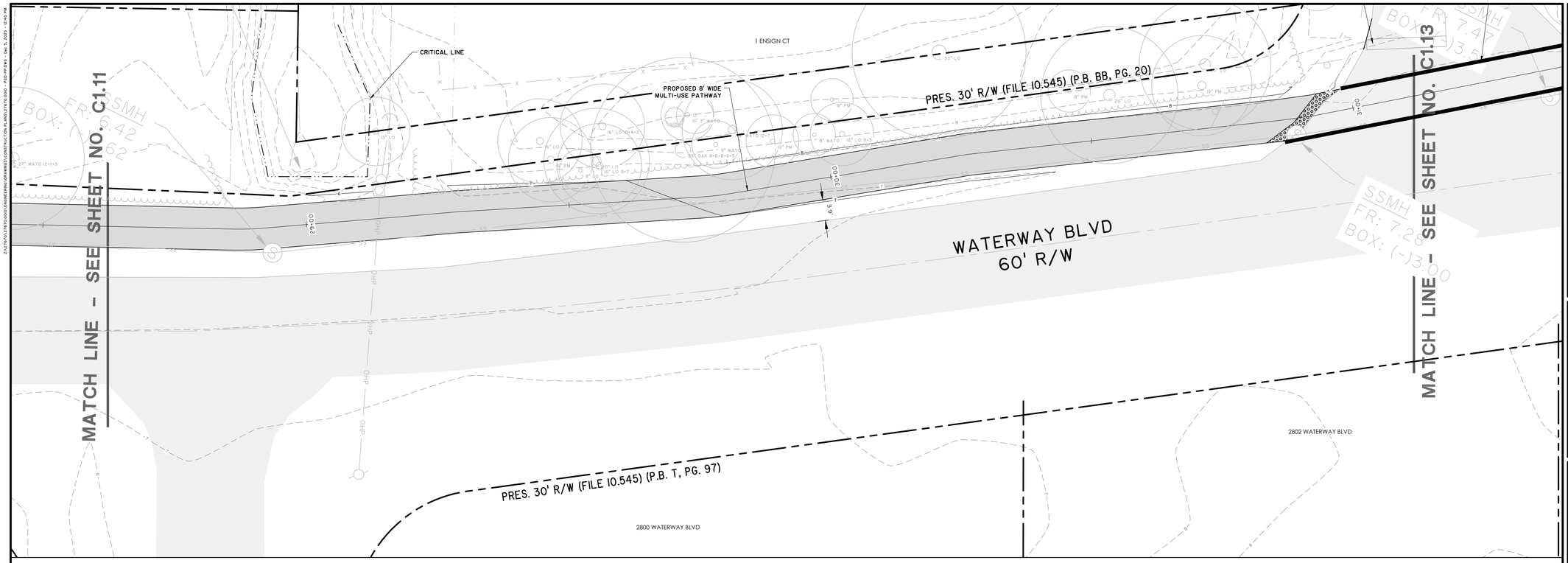
GRAPHIC SCALE: 1 INCH = 10 FEET

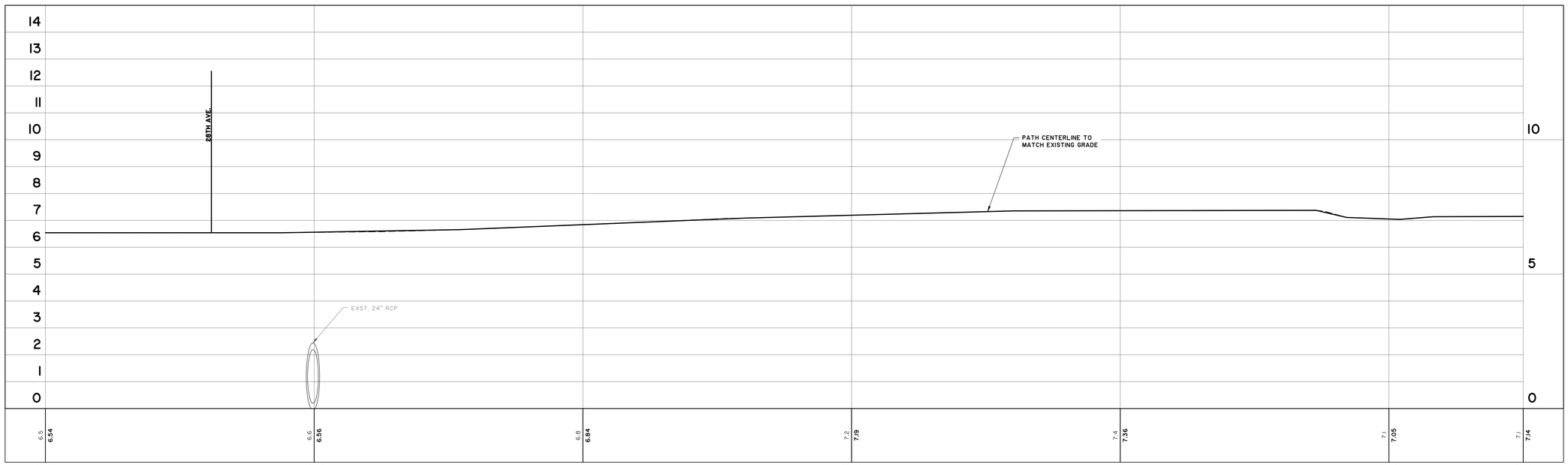
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.11





27670.0010 – Proposed Waterway Blvd
STATIONS: 28+50 – 31+25
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

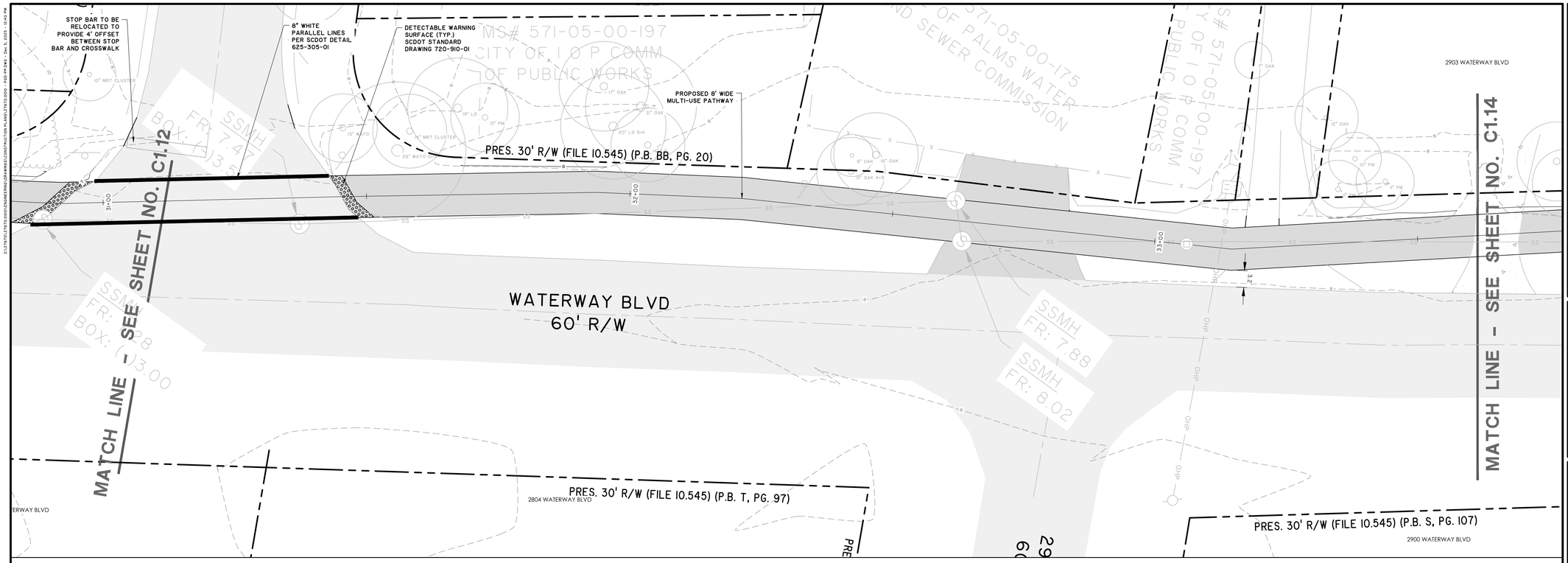
CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

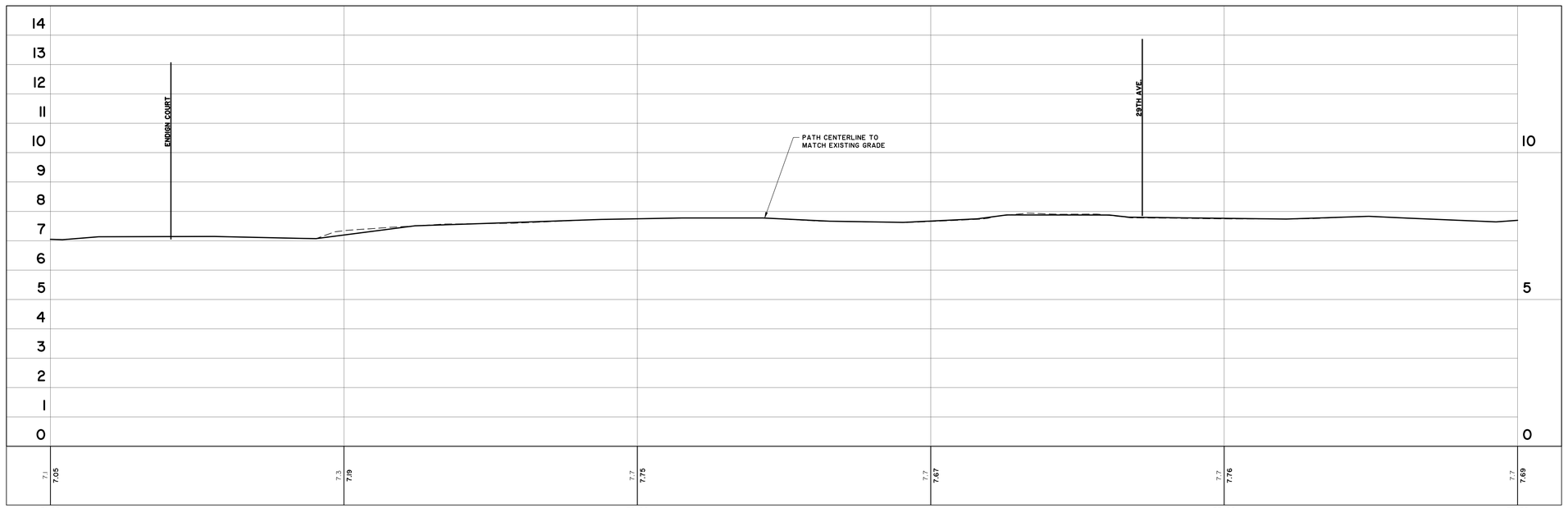
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/6/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.12





27670.0010 – Proposed Waterway Blvd
STATIONS: 31+00 – 33+50
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARNS 12/5/2024 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.13

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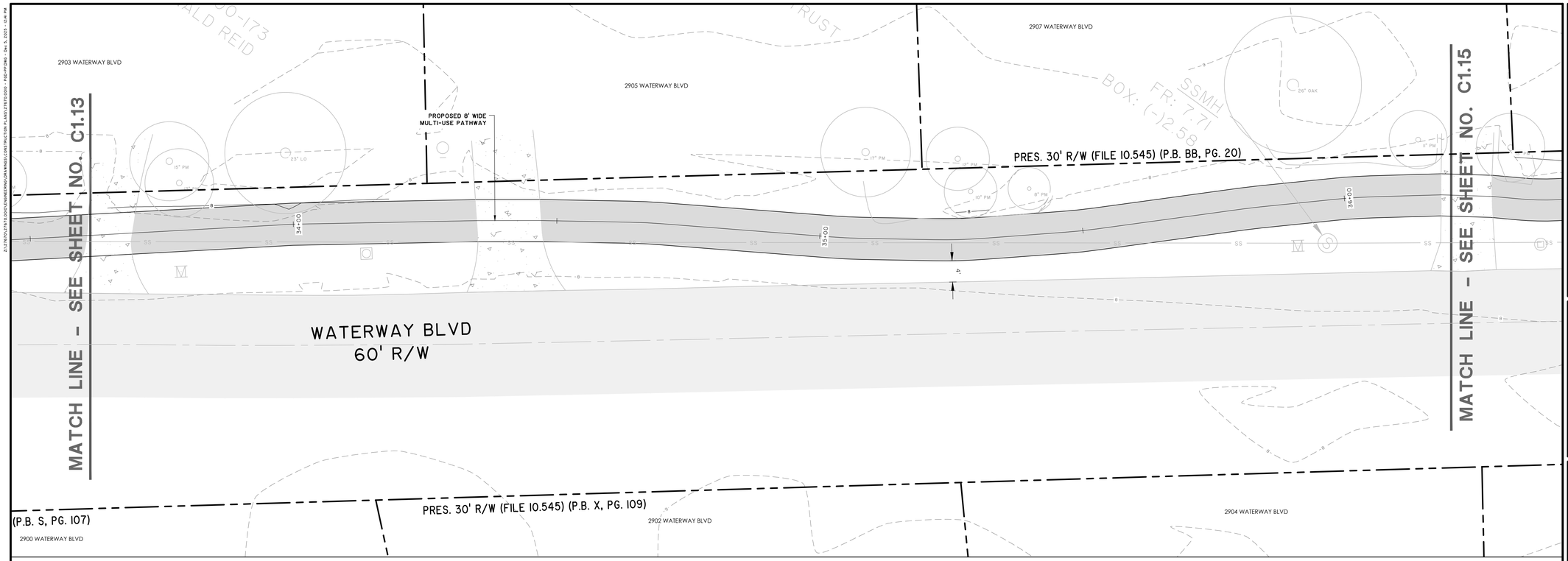

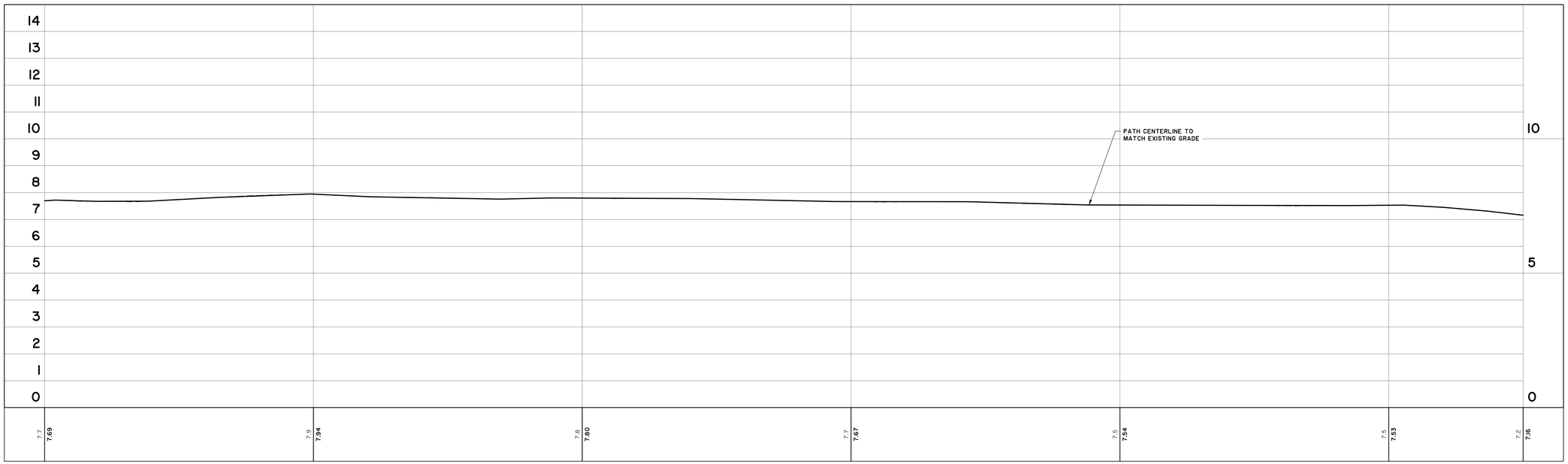

27670.0010 – Proposed Waterway Blvd
STATIONS: 33+50 – 36+25
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARNS 12/5/2023

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

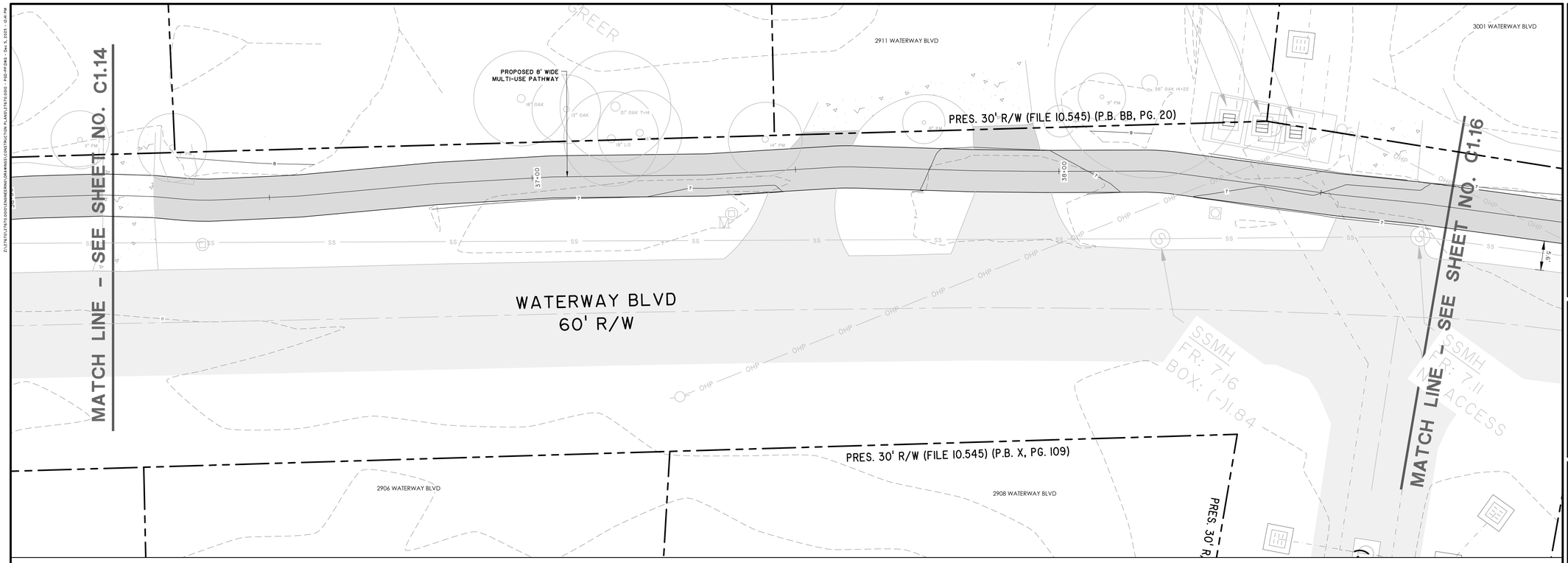
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

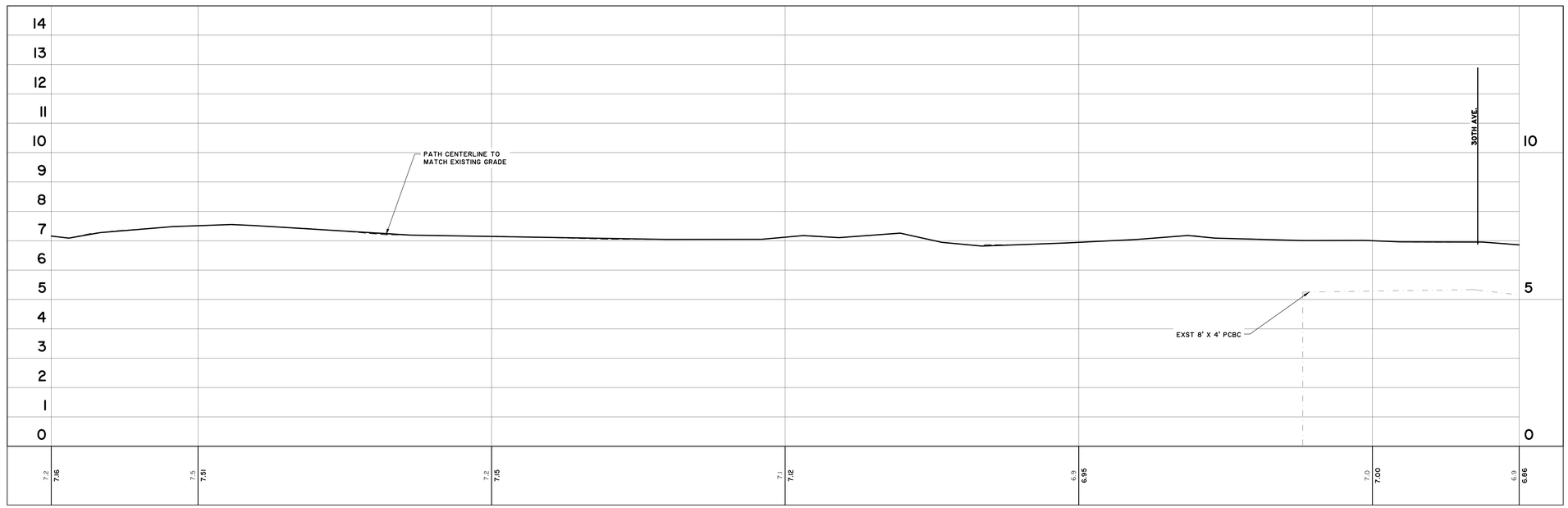
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/6/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.14





27670.0010 – Proposed Waterway Blvd
STATIONS: 36+25 – 38+75
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.15

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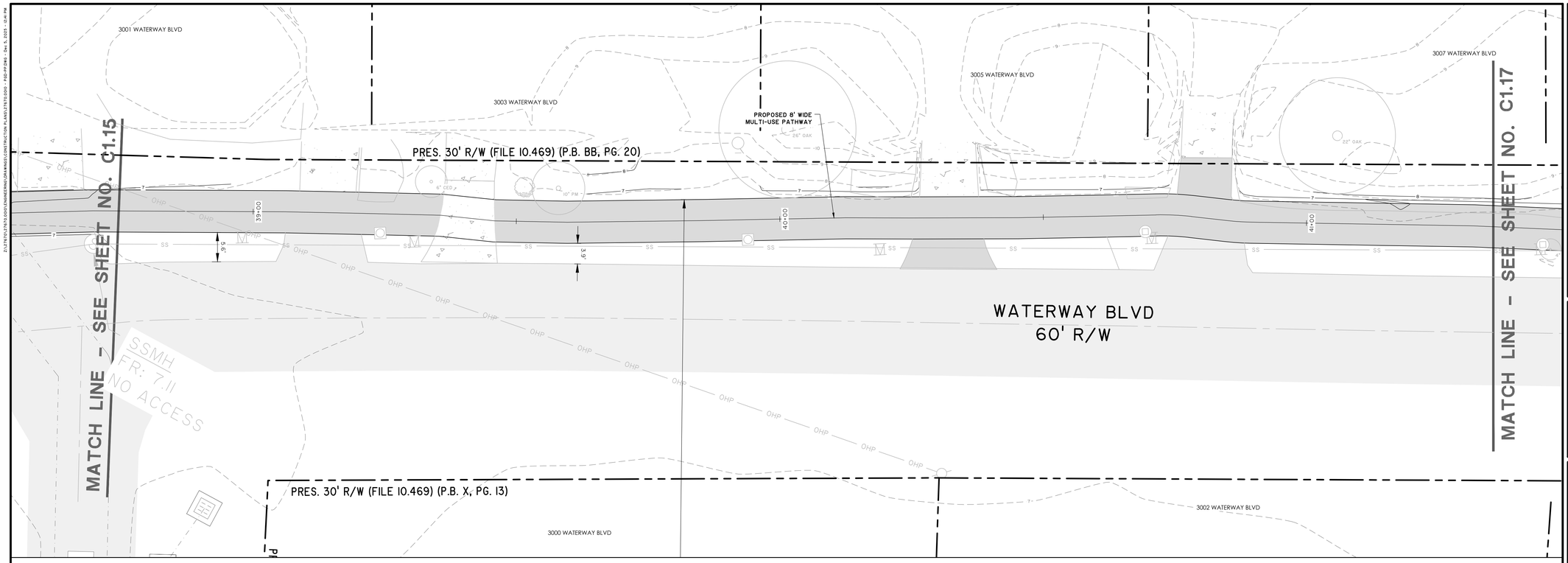

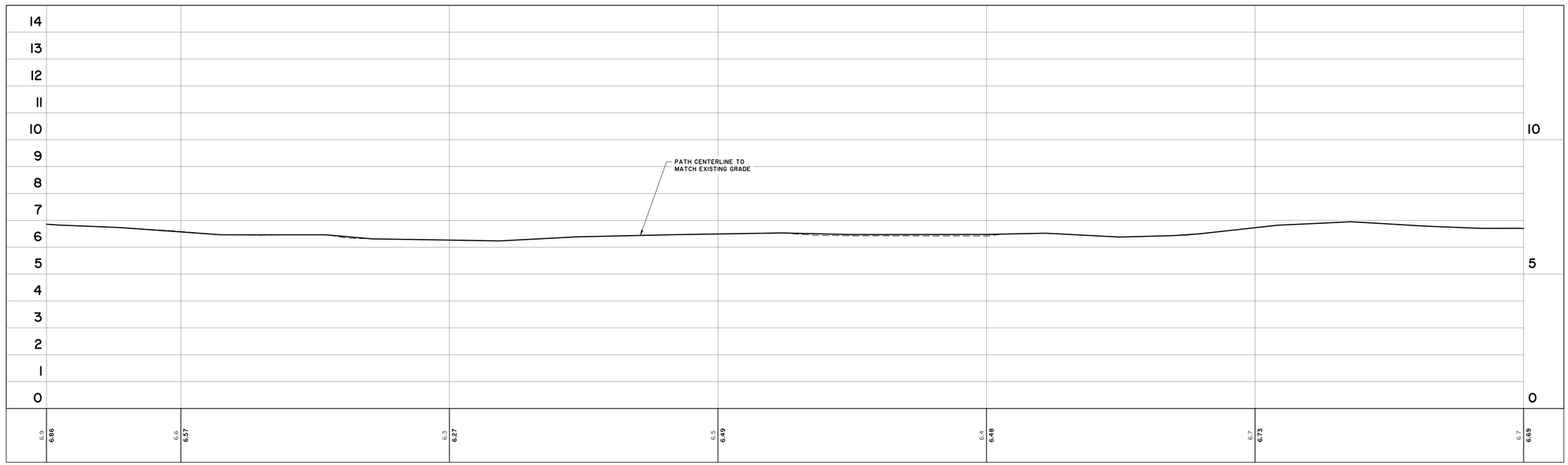

27670.0010 – Proposed Waterway Blvd
STATIONS: 38+75 – 41+50
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

GRAPHIC SCALE: 1 INCH = 10 FEET

GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
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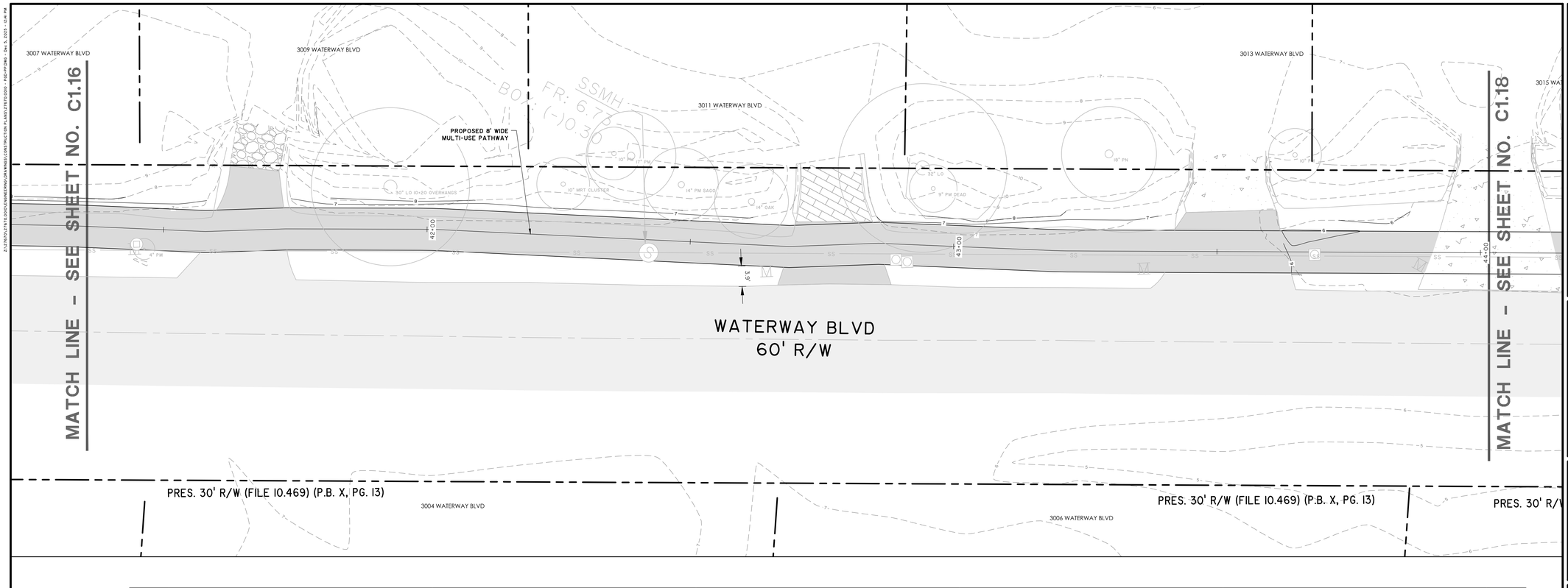
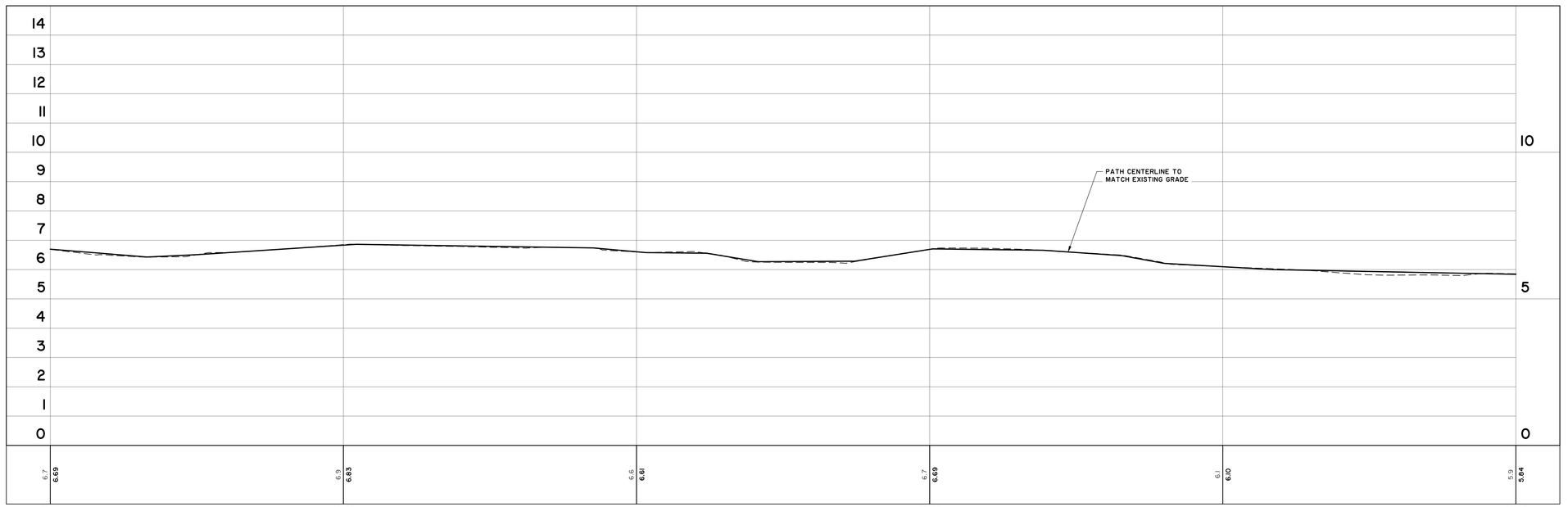
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.16





27670.0010 – Proposed Waterway Blvd
STATIONS: 41+50 – 44+00
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

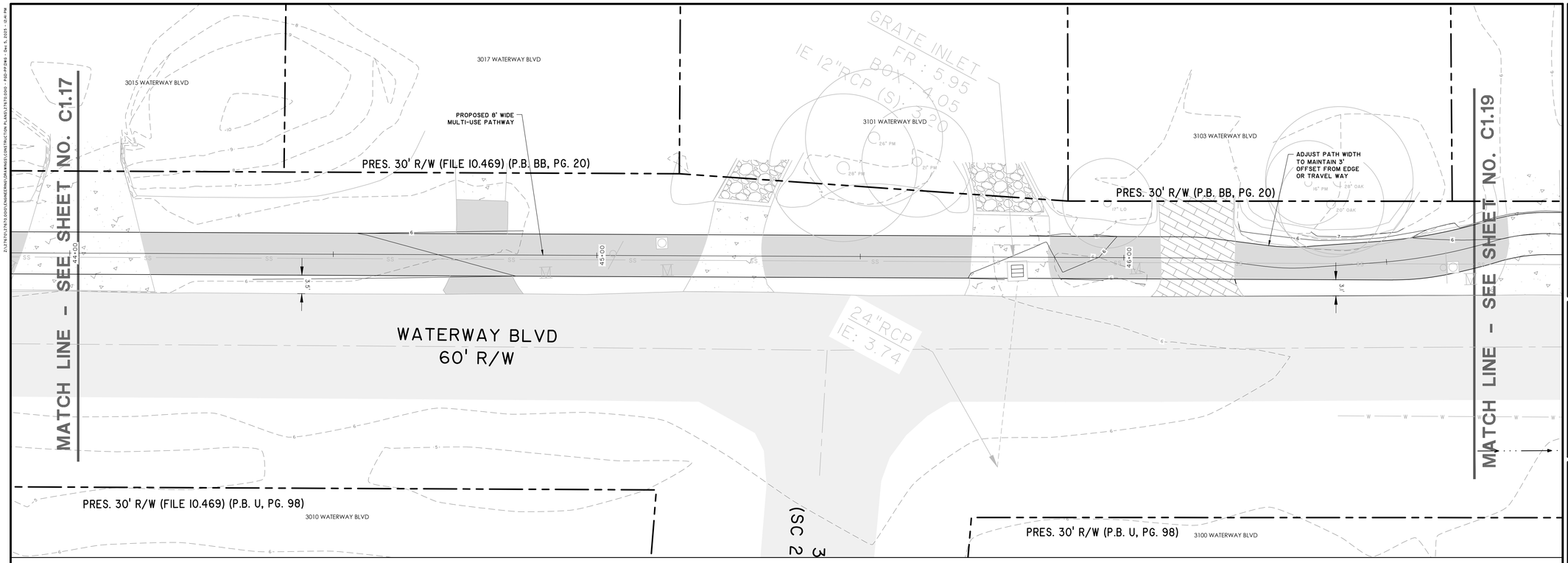
CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

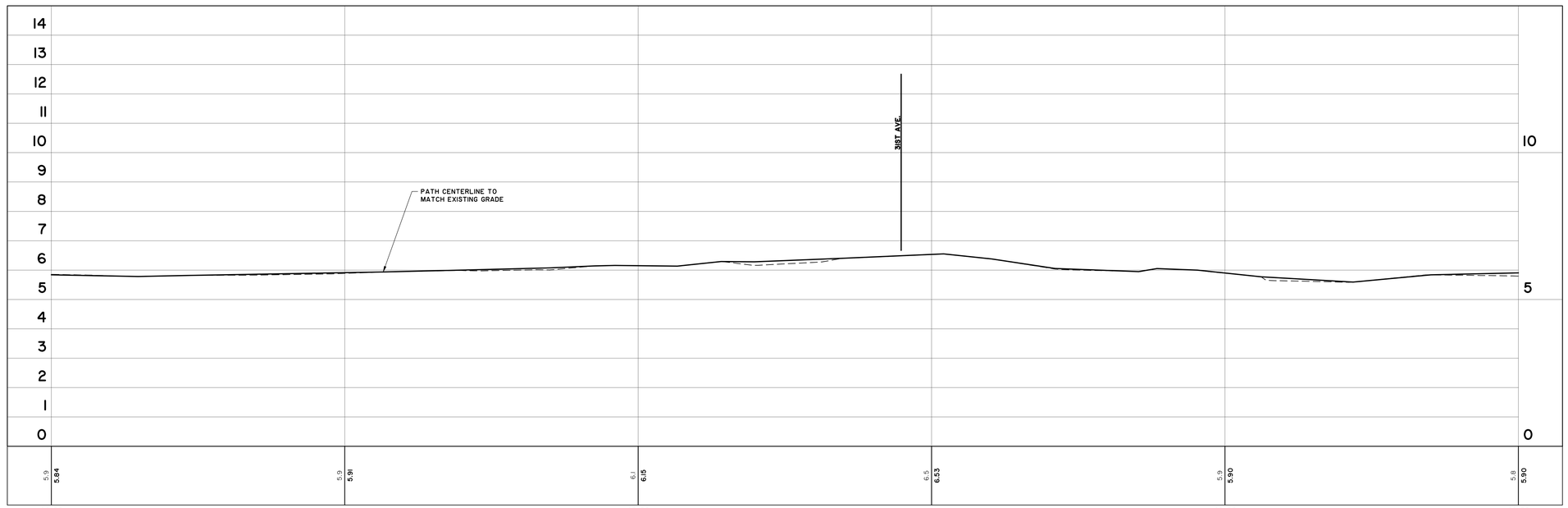
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.17





27670.0010 – Proposed Waterway Blvd
STATIONS: 44+00 – 46+50
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

GRAPHIC SCALE: 1 INCH = 10 FEET

GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.18

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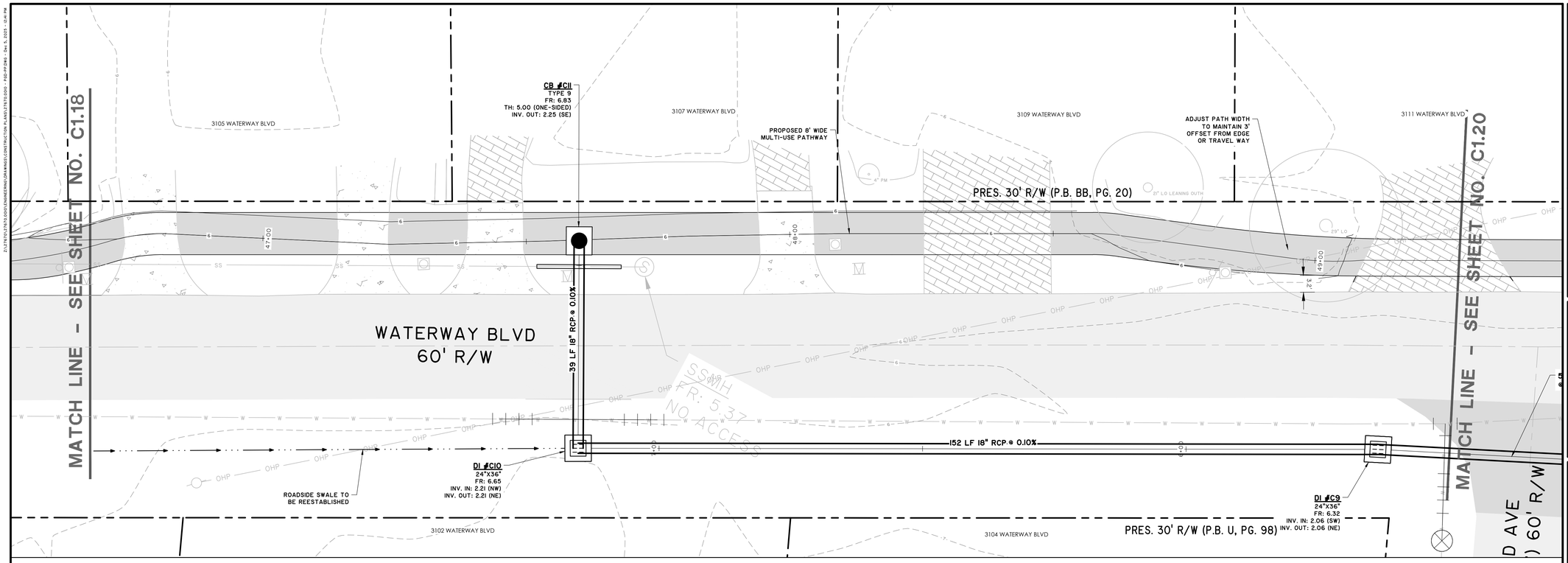

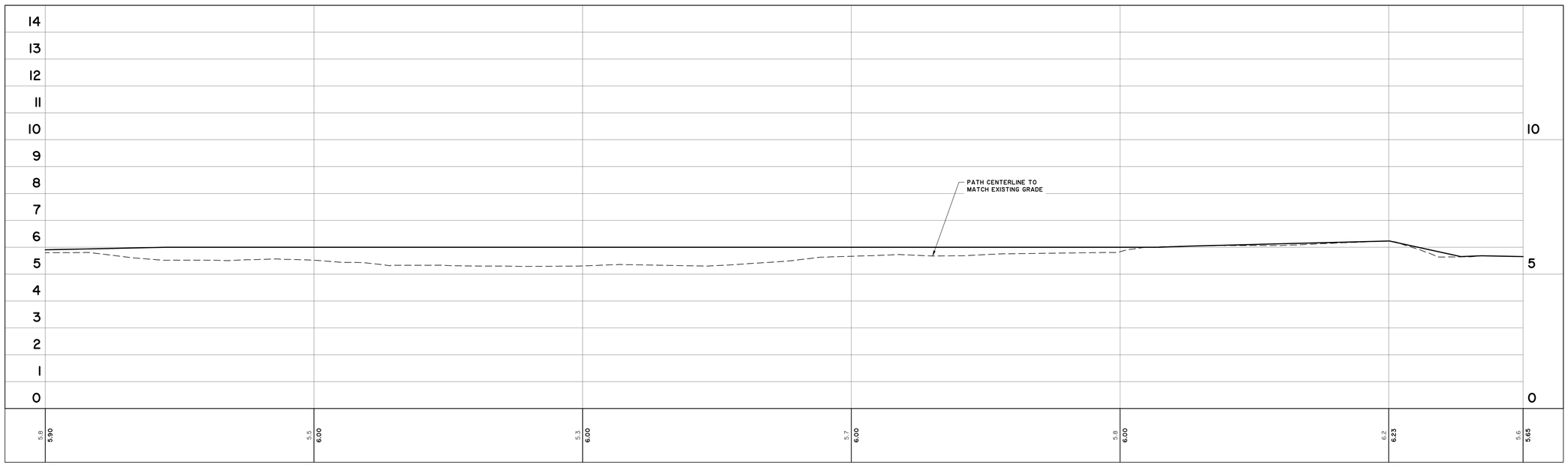

27670.0010 – Proposed Waterway Blvd
STATIONS: 46+50 – 49+25
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARON 12/5/2025

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

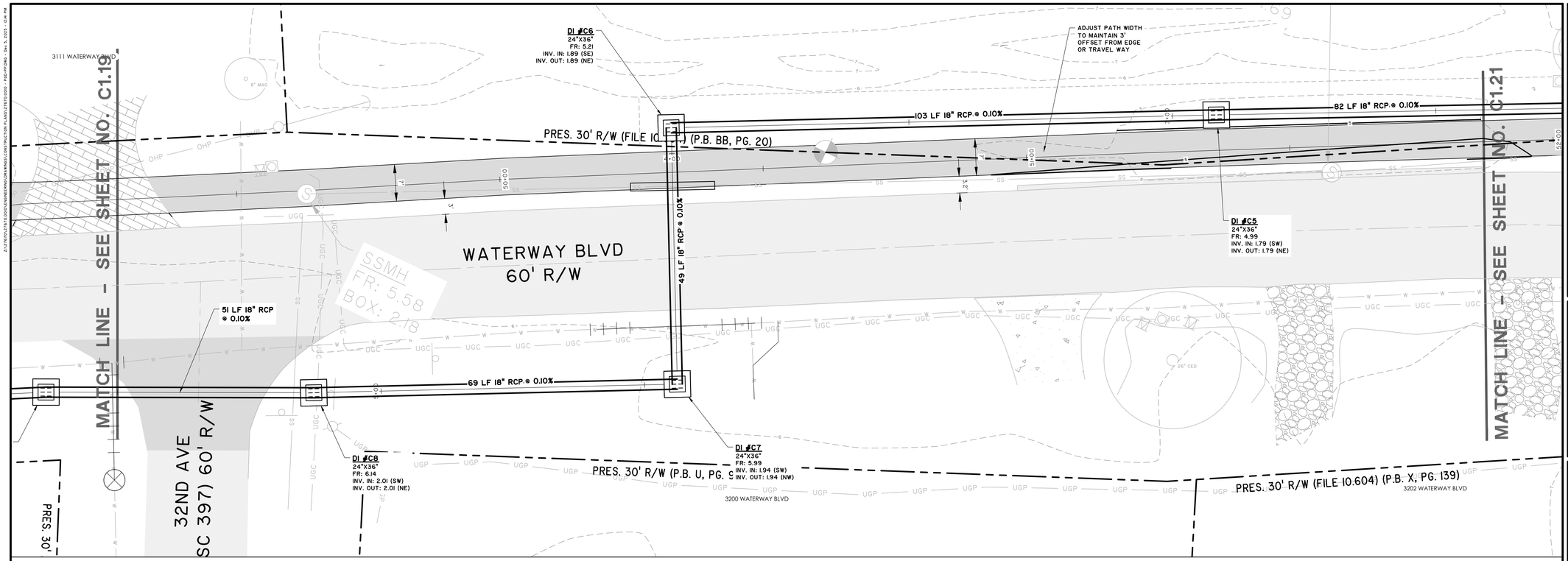
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

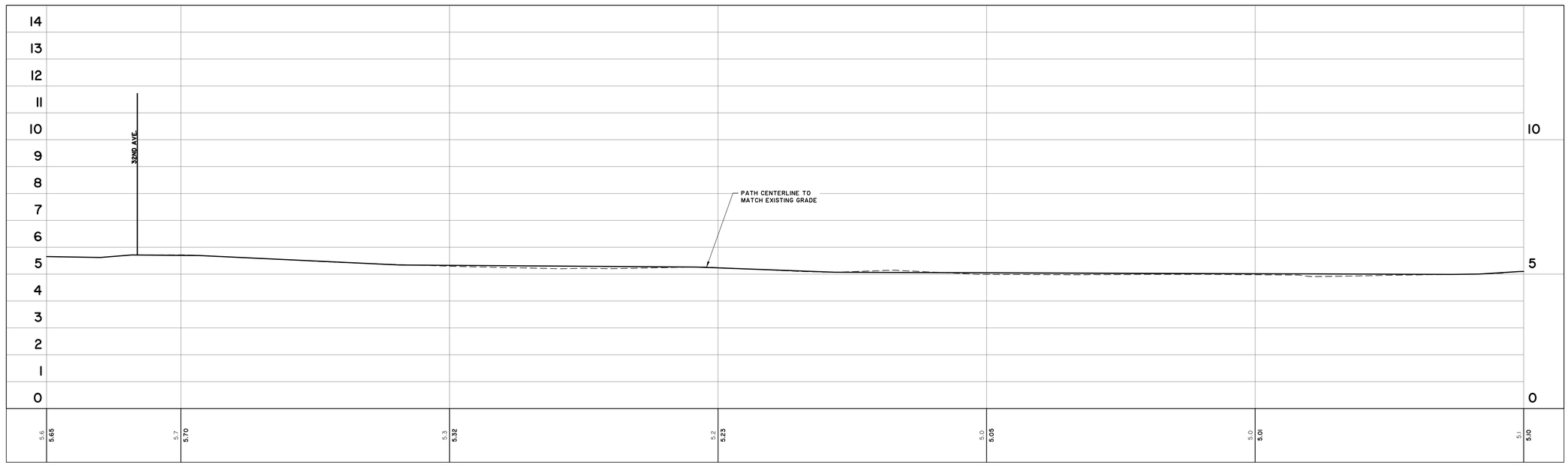
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.19





27670.0010 – Proposed Waterway Blvd
STATIONS: 49+25 – 52+00
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARO 12/5/2024

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

10 0 5 10
GRAPHIC SCALE:
1 INCH = 10 FEET

10 0 5 10
GRAPHIC SCALE:
1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.20

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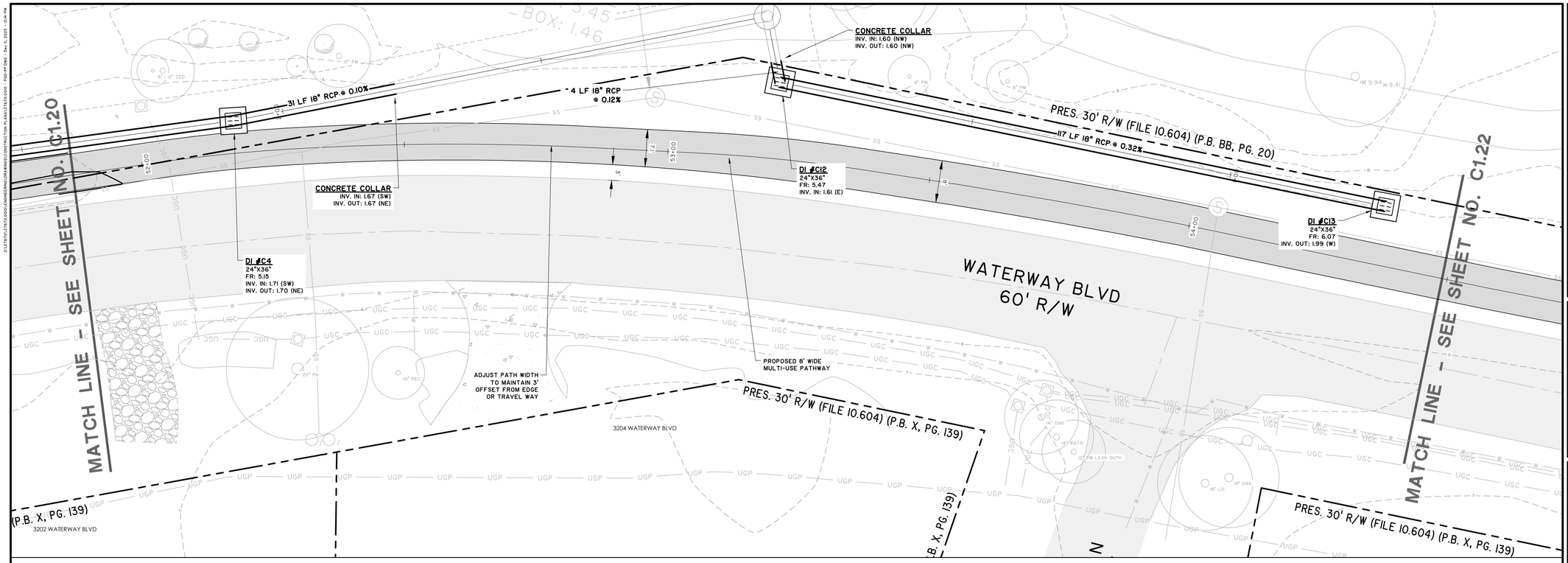

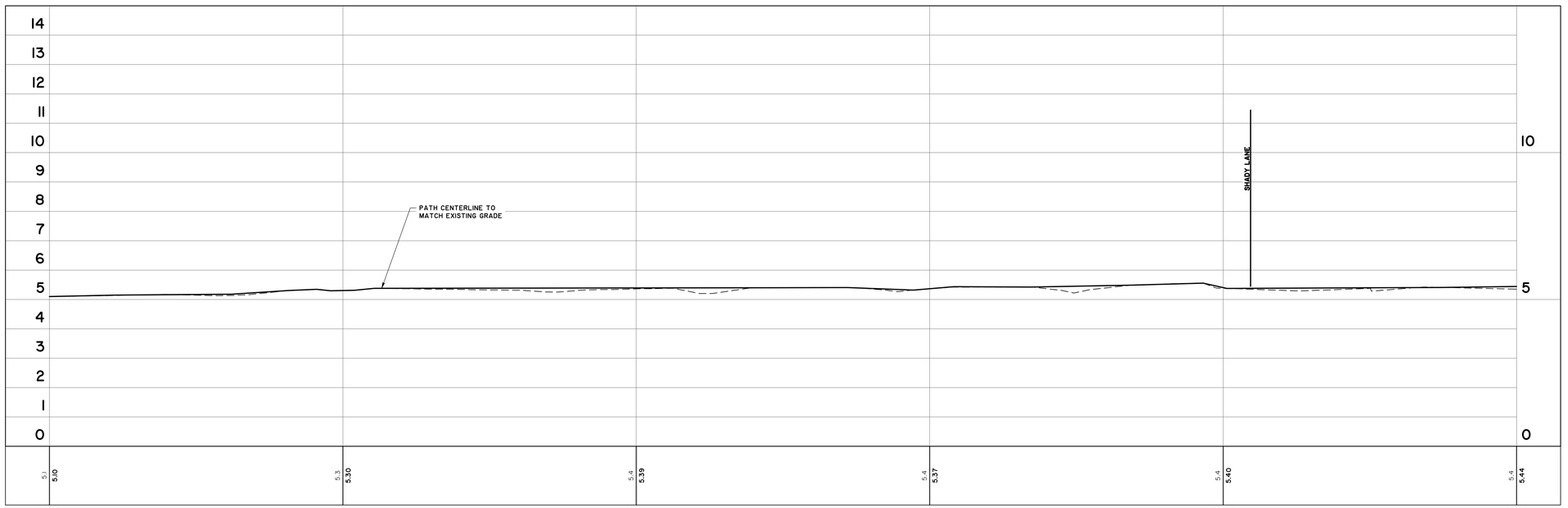

27670.0010 – Proposed Waterway Blvd
STATIONS: 52+00 – 54+50
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARCH 12/5/2024

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

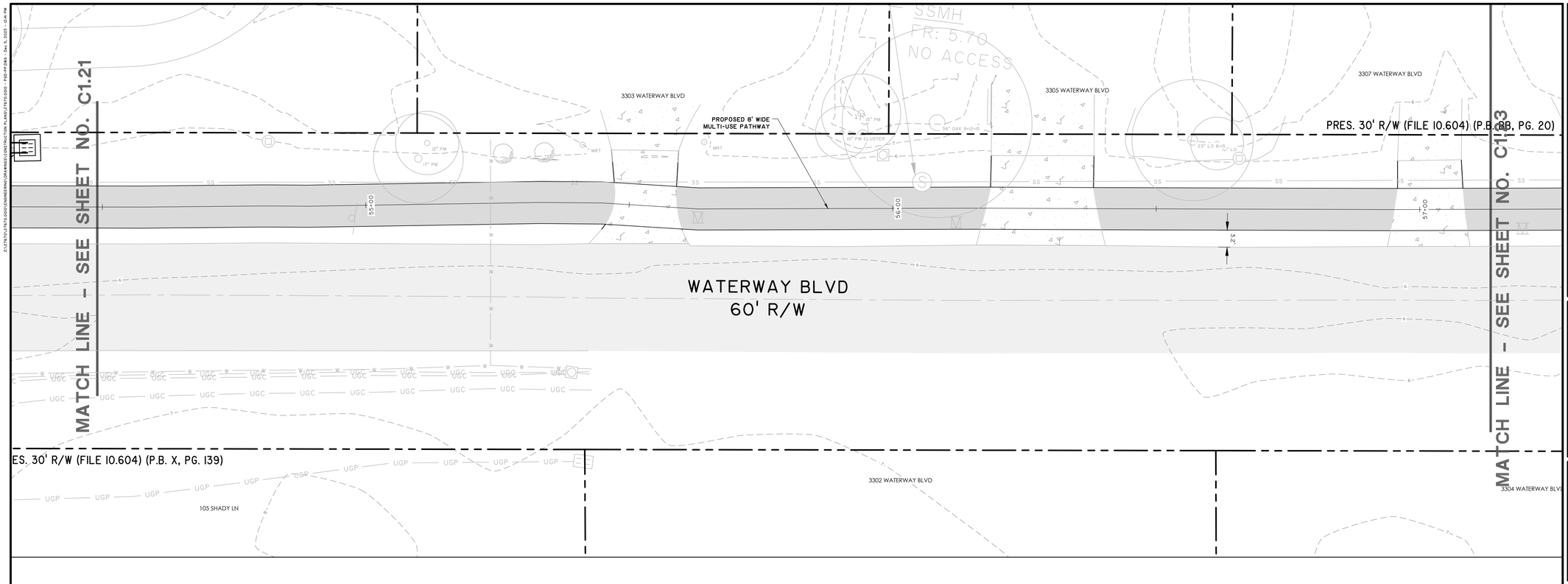
GRAPHIC SCALE: 1 INCH = 10 FEET

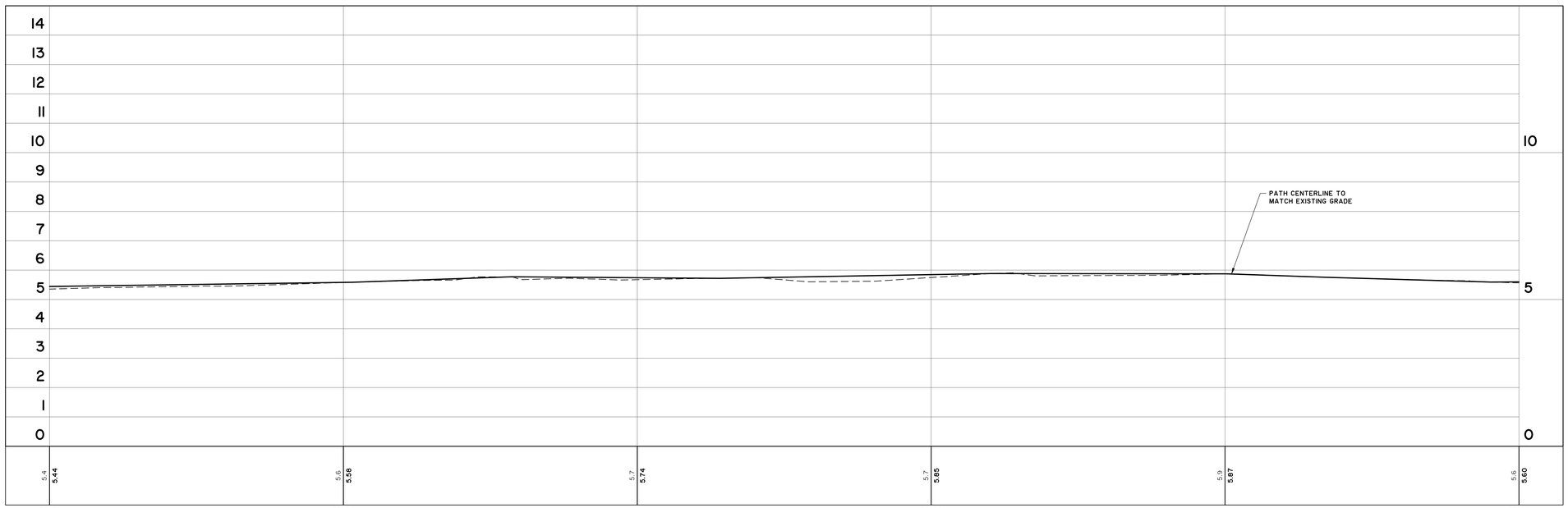
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.21





27670.0010 – Proposed Waterway Blvd
STATIONS: 54+50 – 57+00
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARNS 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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

PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

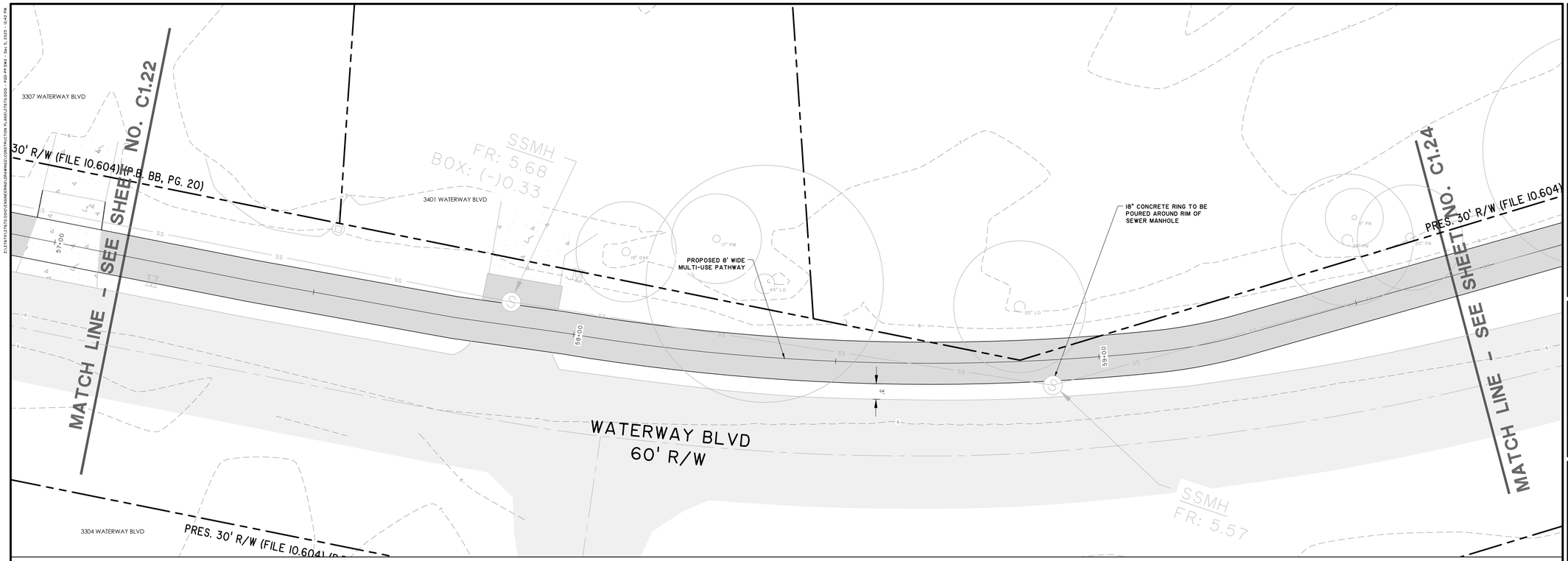
CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

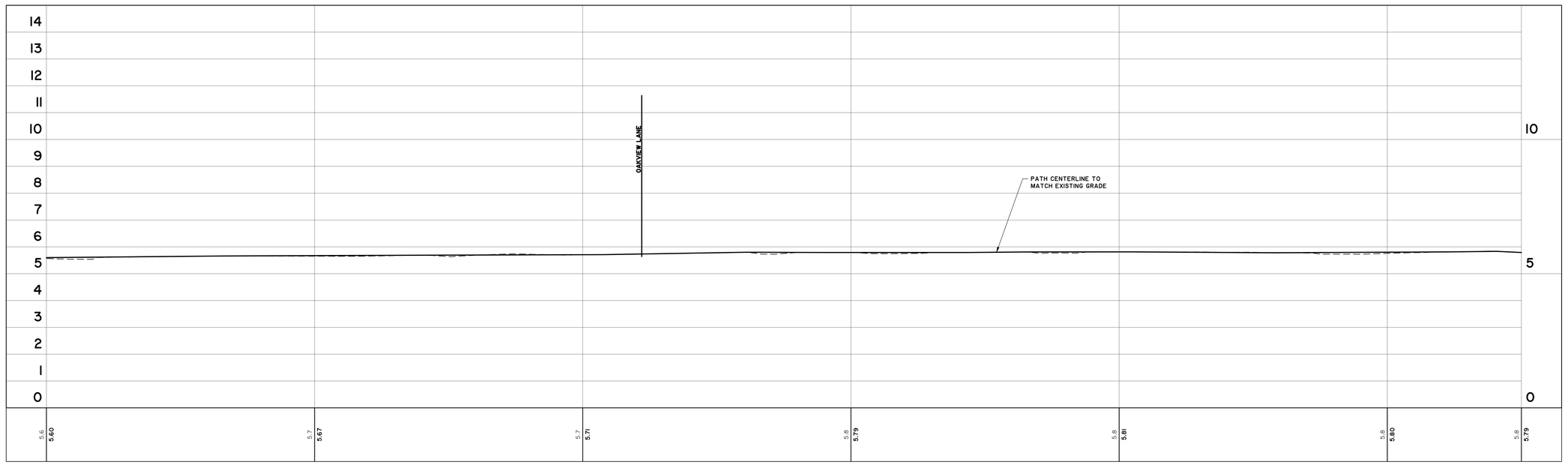
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.22





27670.0010 – Proposed Waterway Blvd
STATIONS: 57+00 – 59+75
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

GRAPHIC SCALE: 1 INCH = 10 FEET

GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.23

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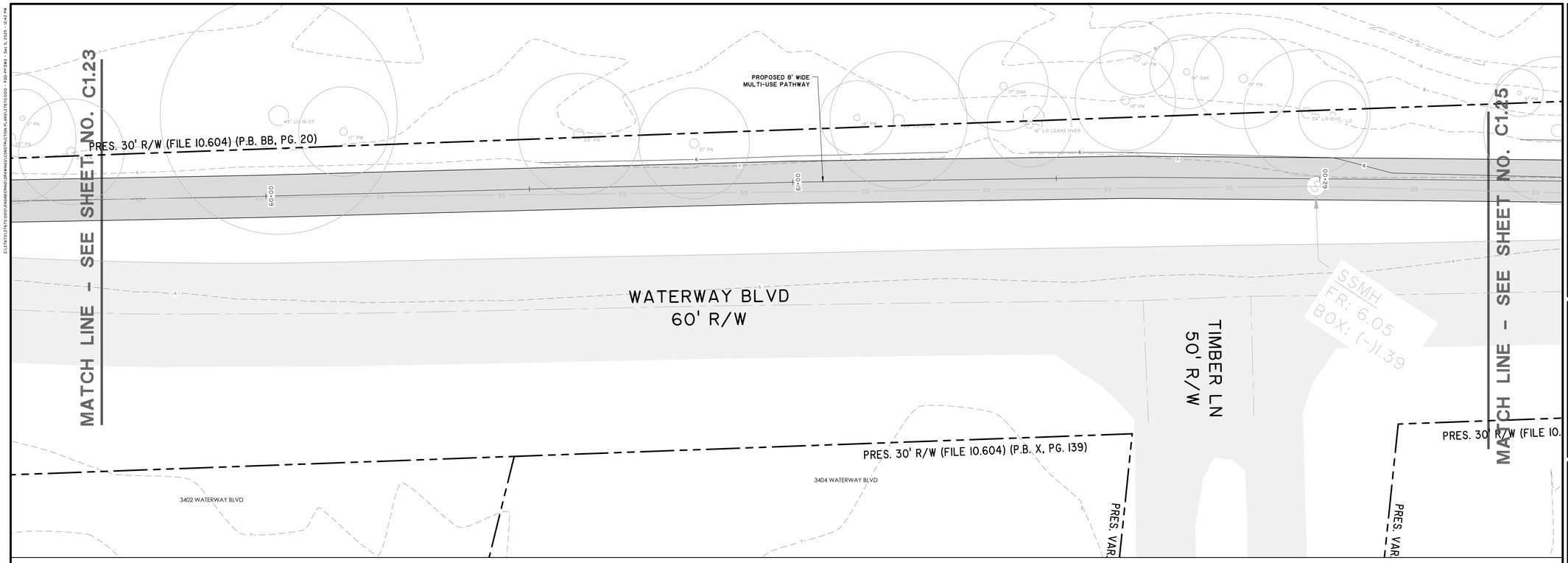

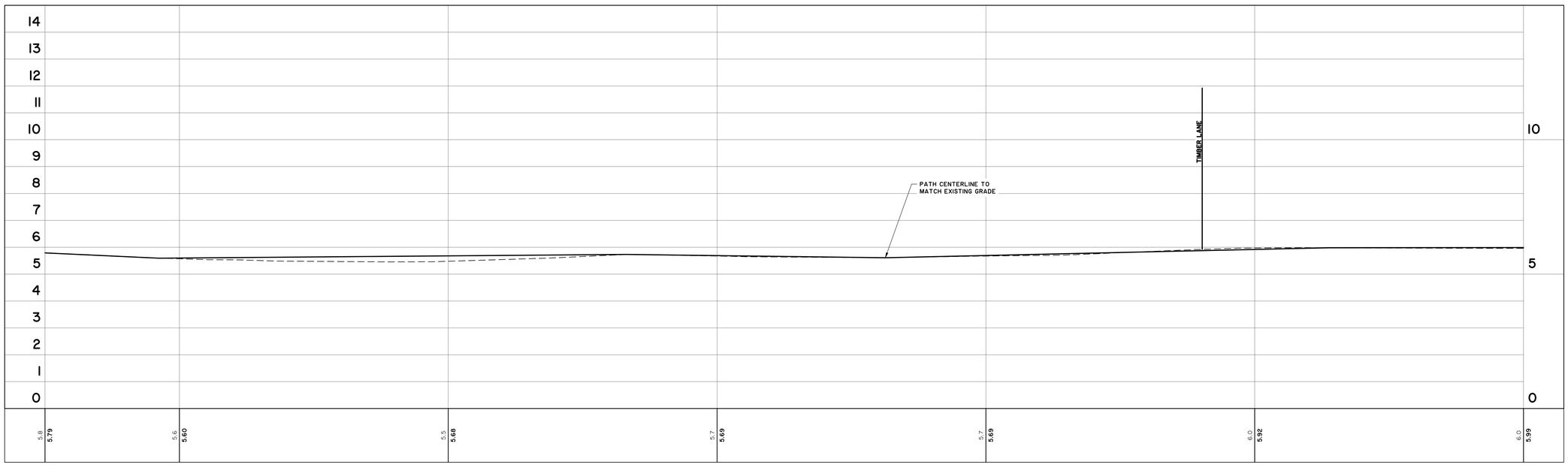

27670.0010 – Proposed Waterway Blvd
STATIONS: 59+75 – 62+50
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 16837 RICHARD PETER KARG 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

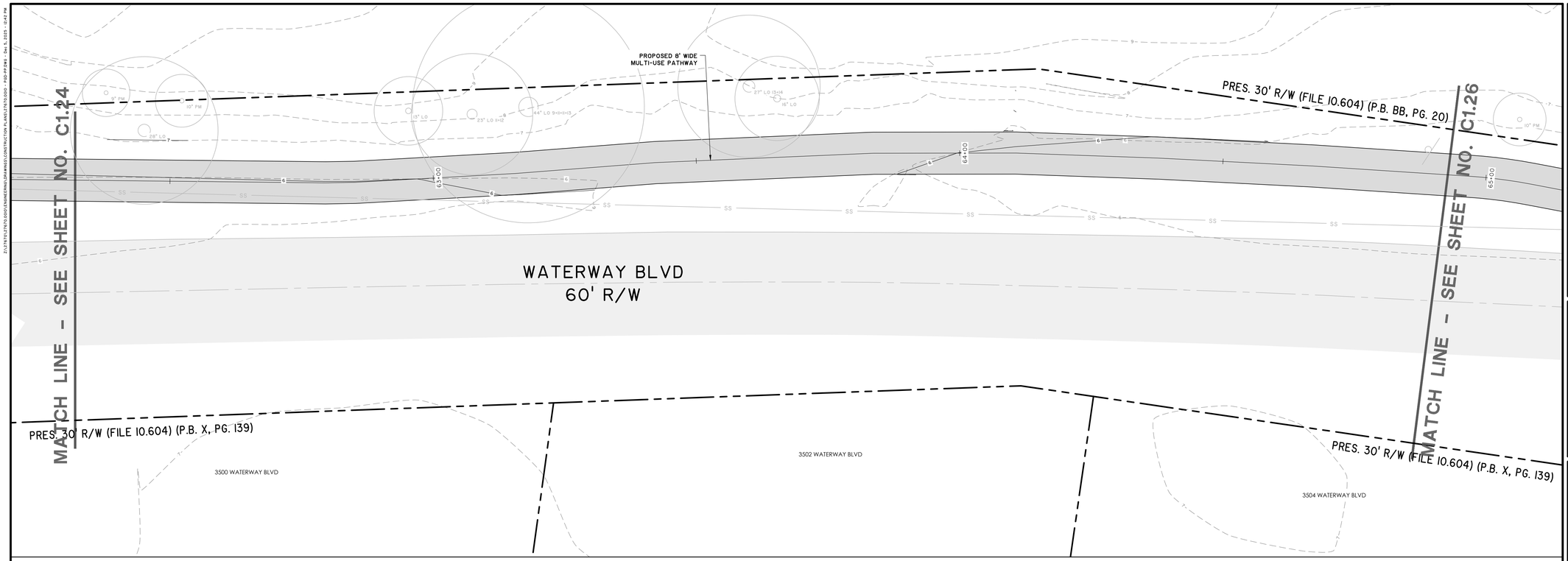
10 0 5 10
GRAPHIC SCALE:
1 INCH = 10 FEET

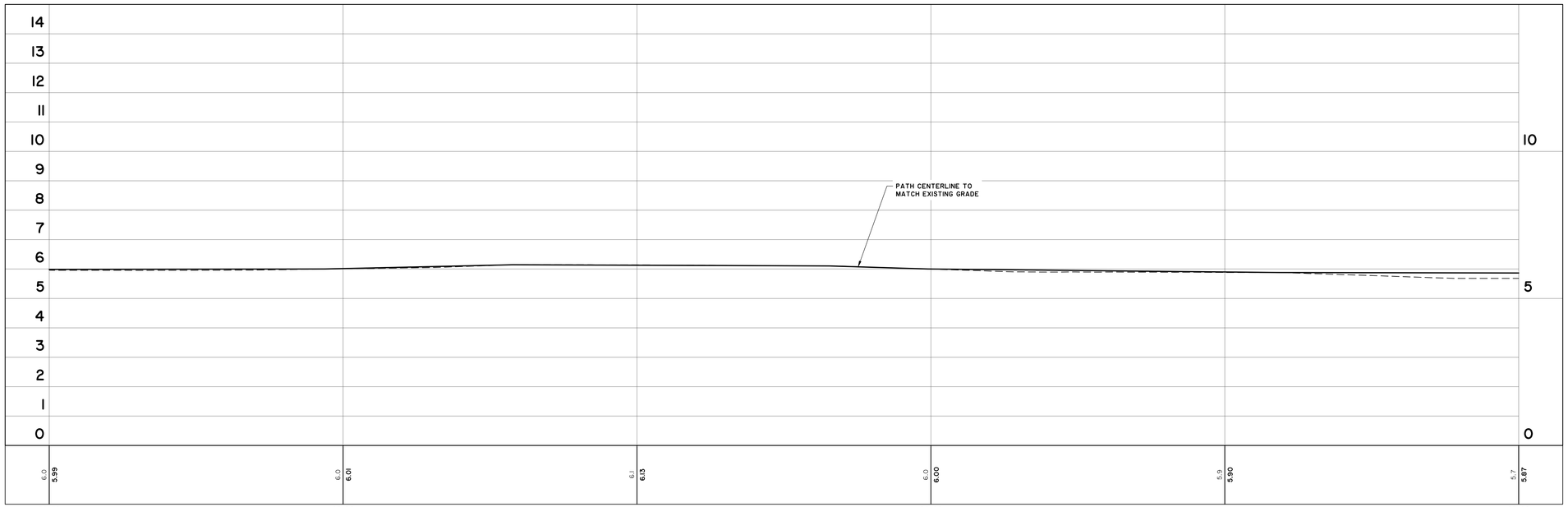
10 0 5 10
GRAPHIC SCALE:
1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.24





27670.0010 – Proposed Waterway Blvd
STATIONS: 62+50 – 65+00
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 16837 RICHARD PETER KARCH 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00285 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

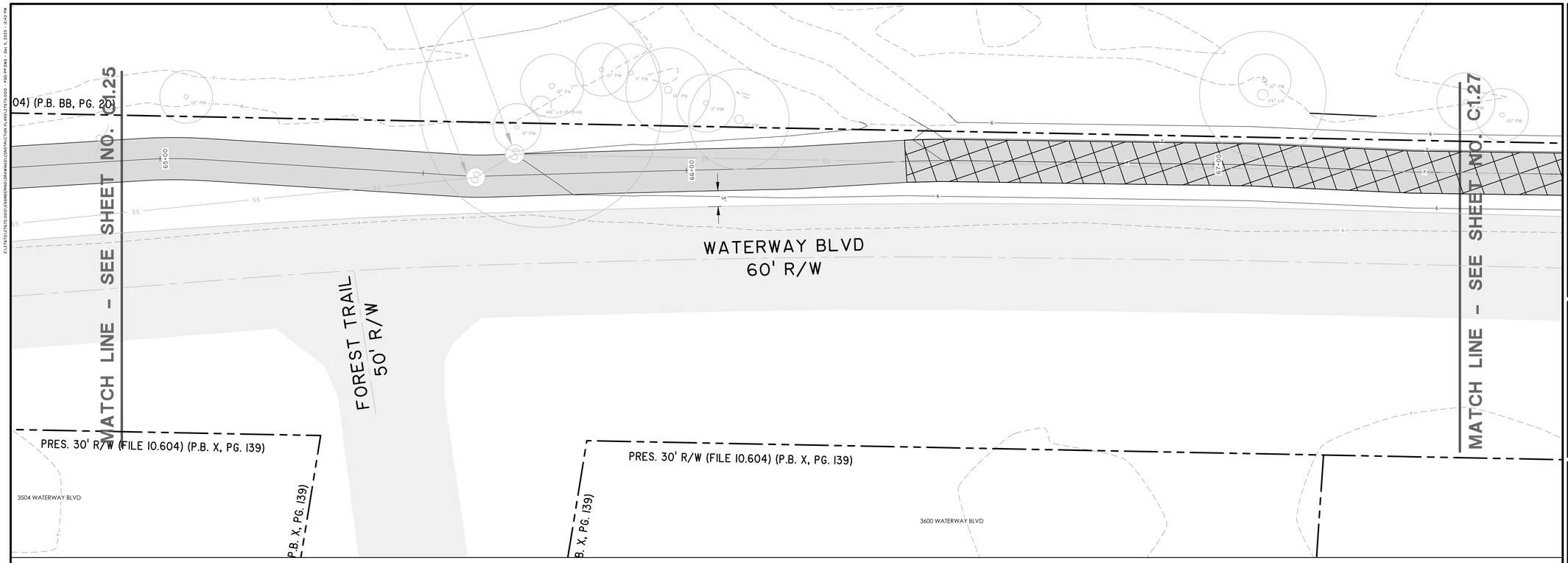
CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

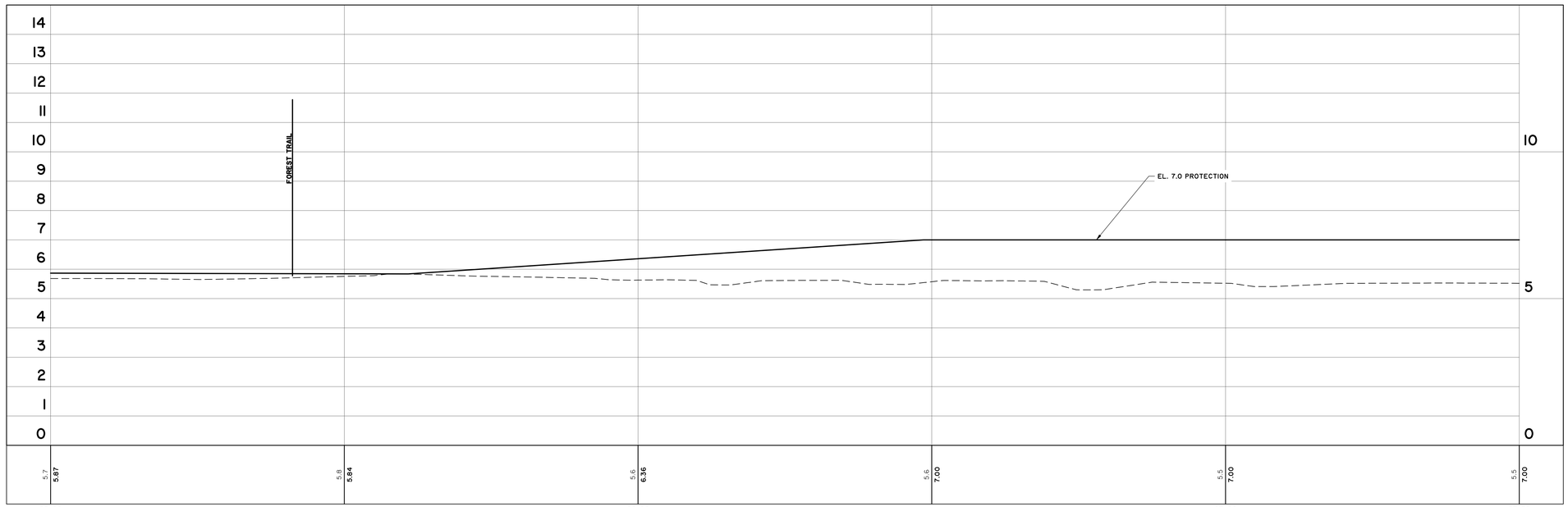
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.25





27670.0010 – Proposed Waterway Blvd
STATIONS: 65+00 – 67+50
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

LEGEND

- PATHWAY FILL
- ROAD REGRADE
- PATHWAY FILL - ONE WALL

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARPINSKI 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

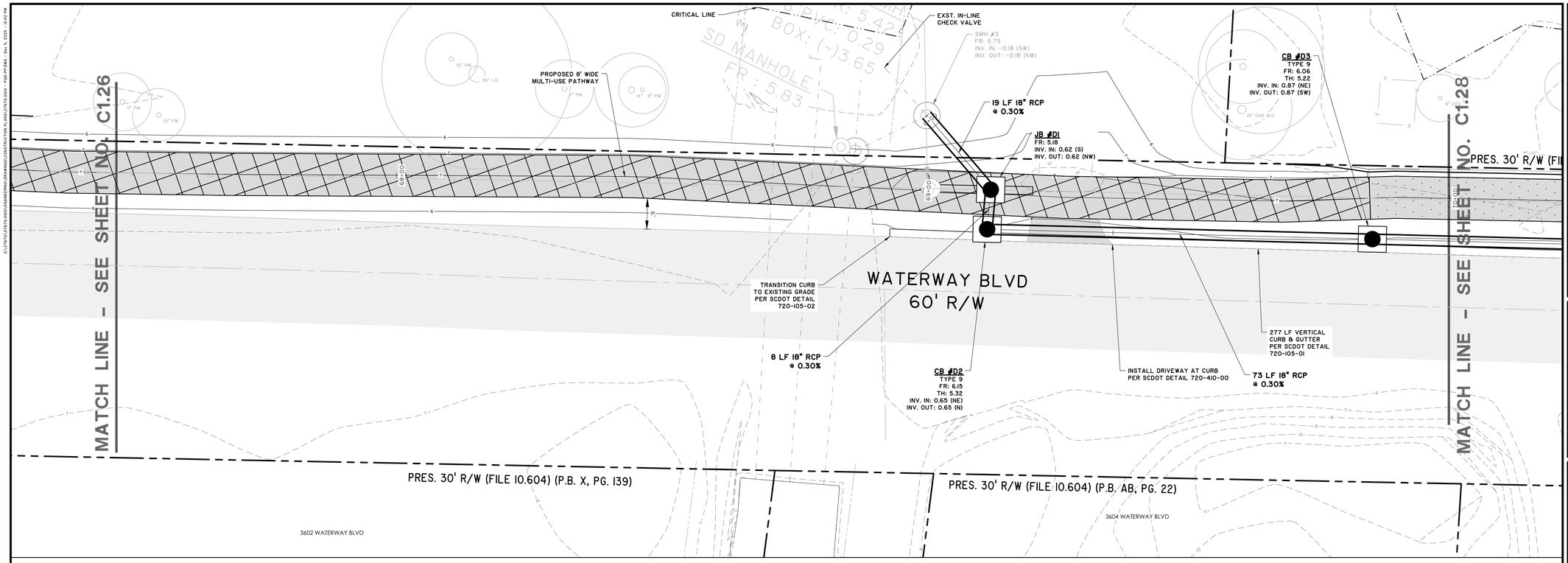
GRAPHIC SCALE: 1 INCH = 10 FEET

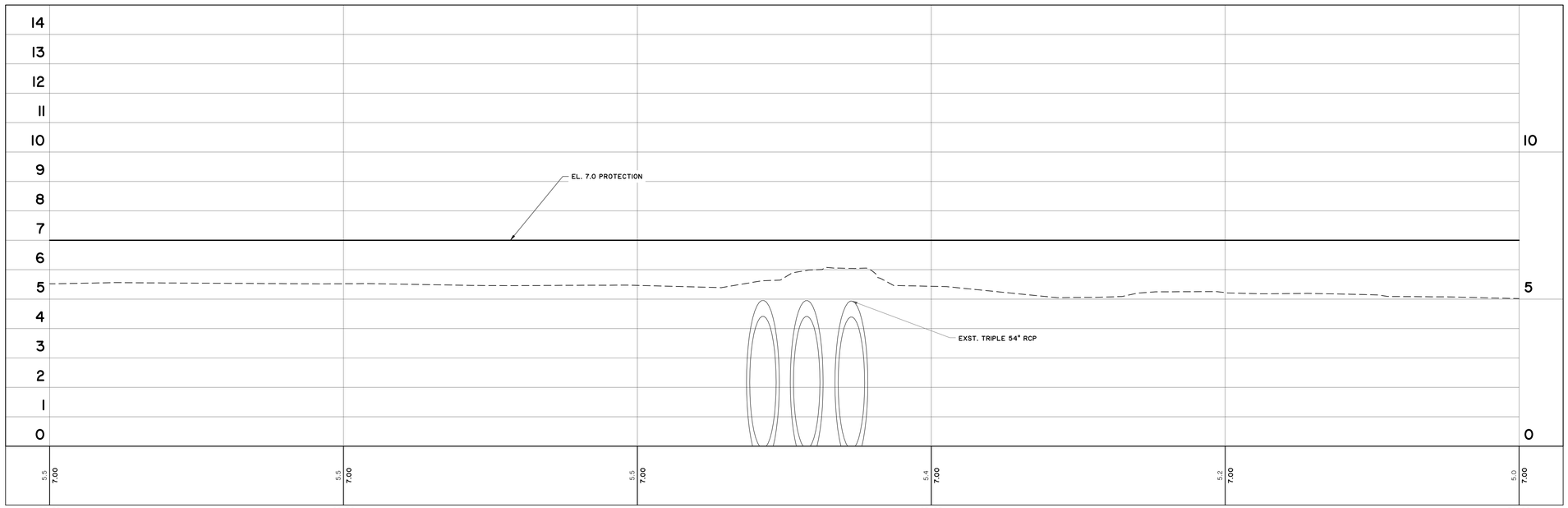
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.26





27670.0010 – Proposed Waterway Blvd
STATIONS: 67+50 – 70+00
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

LEGEND

- PATHWAY FILL
- ROAD REGRADE
- PATHWAY FILL - ONE WALL

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARNAY 12/5/2024

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

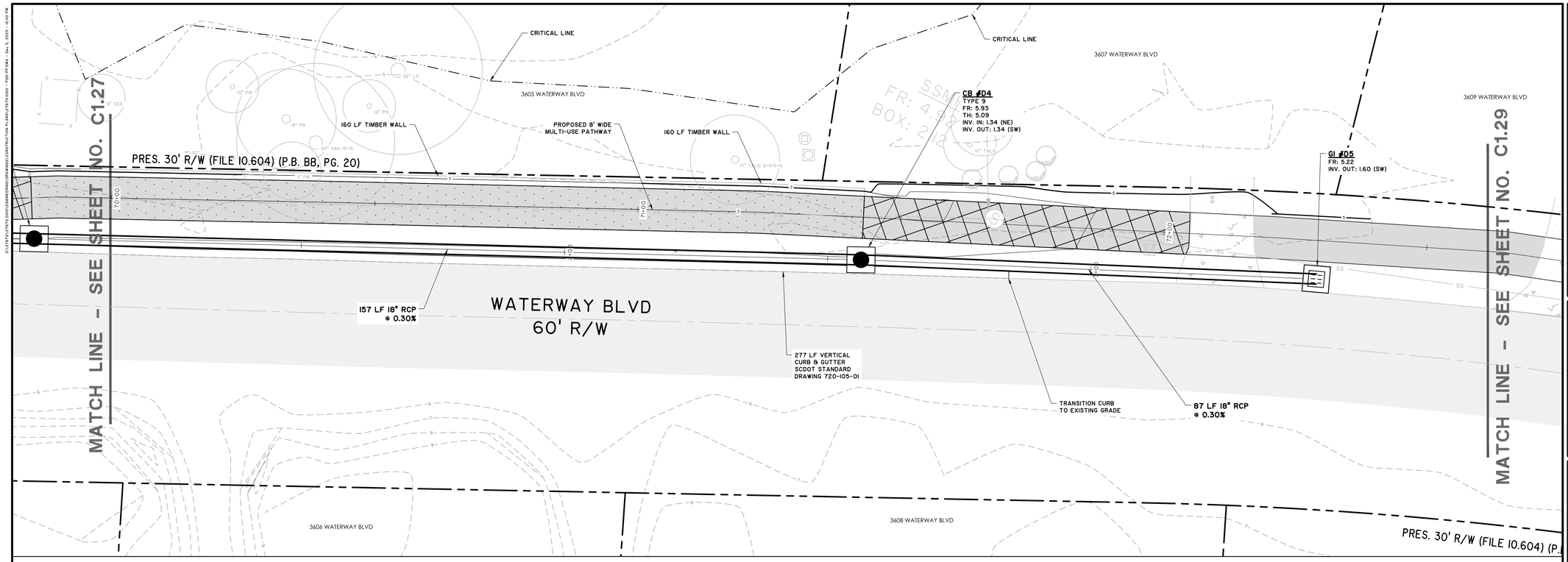
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

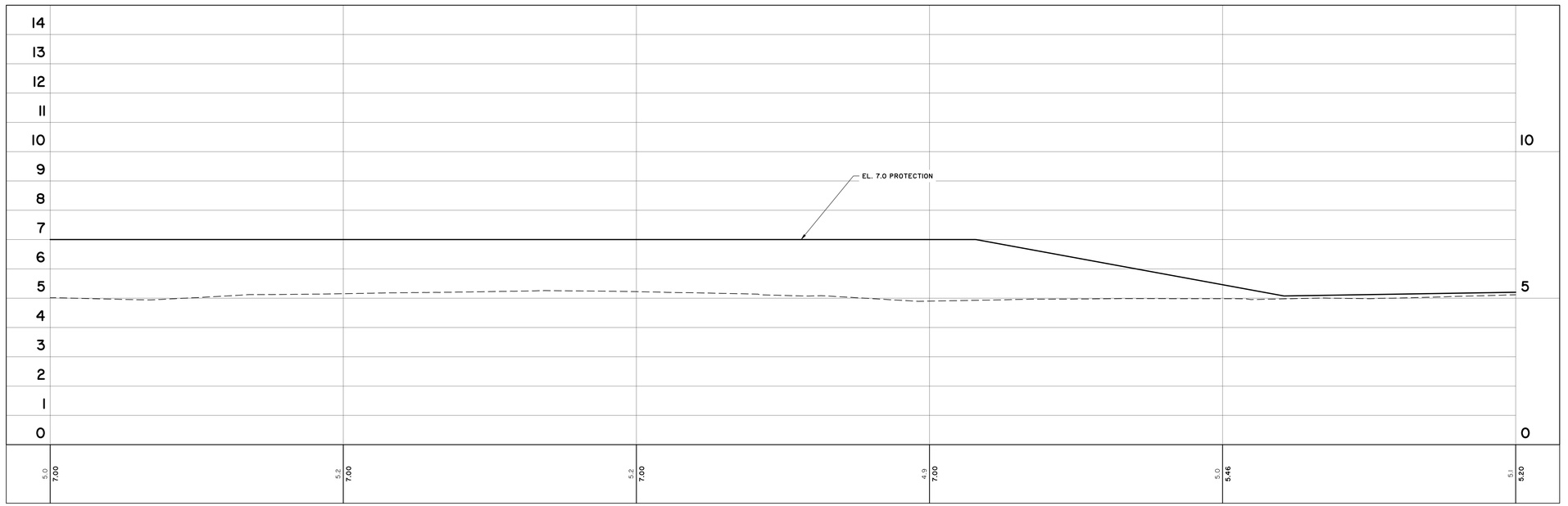
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.27





27670.0010 – Proposed Waterway Blvd
STATIONS: 70+00 – 72+50
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

LEGEND

- PATHWAY FILL
- ROAD REGRADE
- PATHWAY FILL - ONE WALL

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARDOS 12/5/2025

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

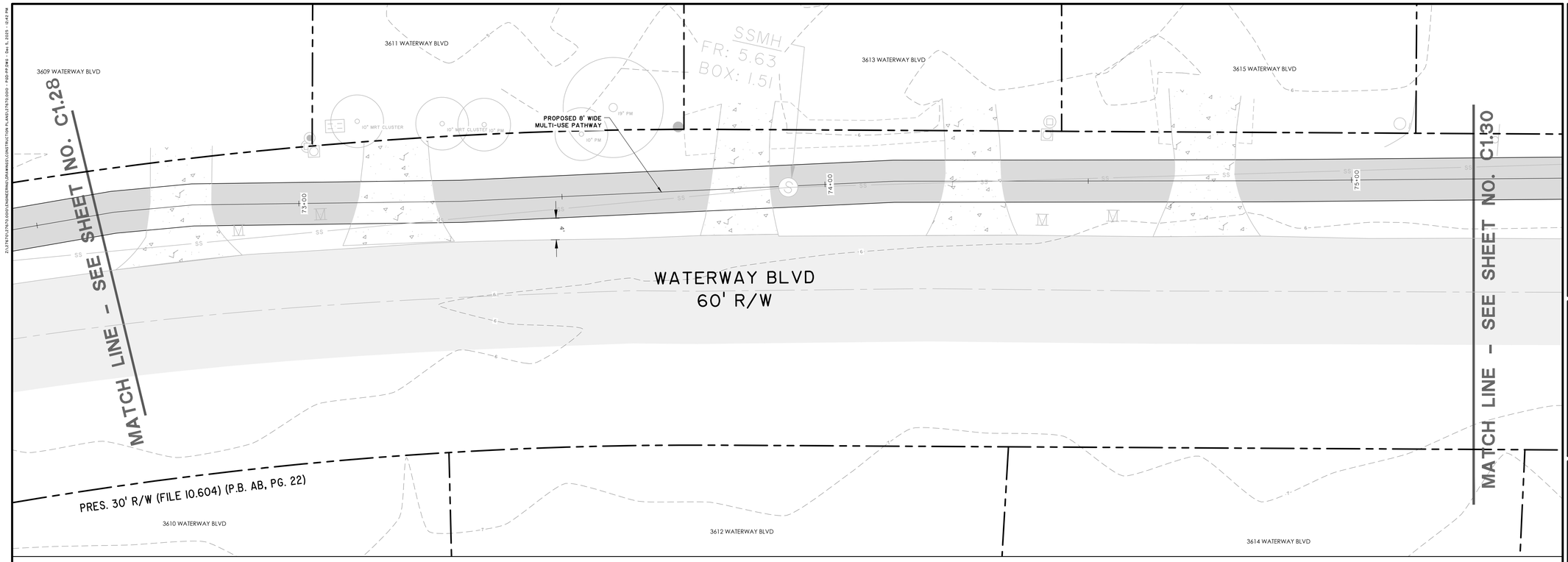
GRAPHIC SCALE: 1 INCH = 10 FEET

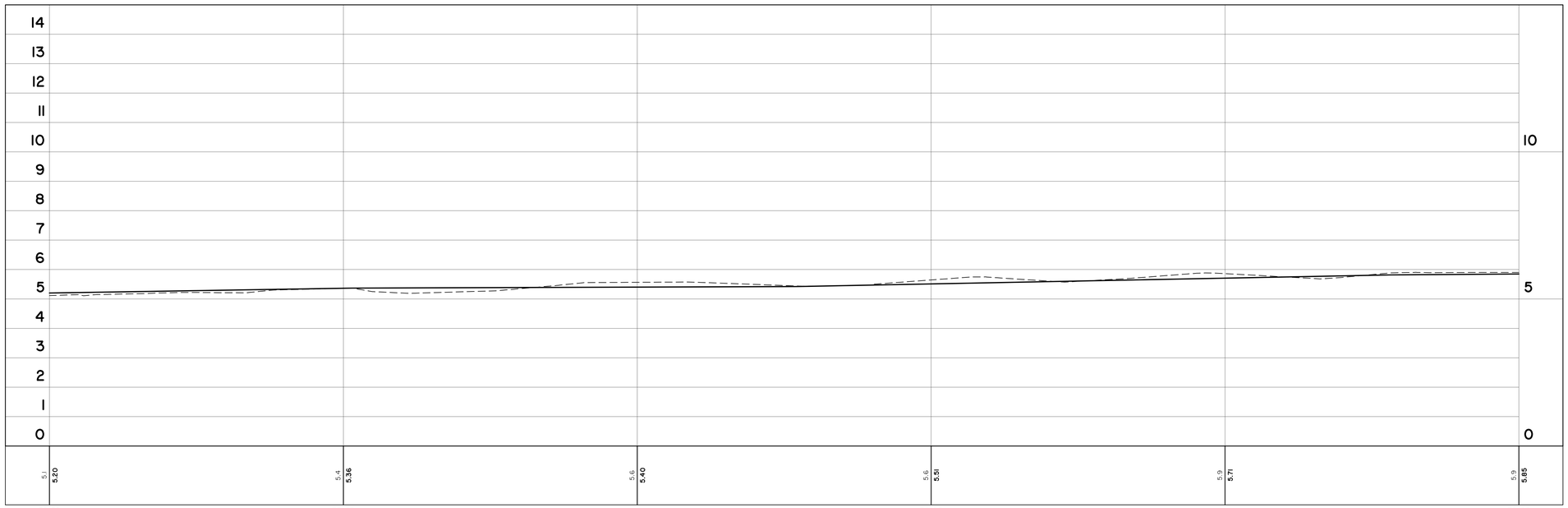
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.28





27670.0010 – Proposed Waterway Blvd
STATIONS: 72+50 – 75+00
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARCH 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

GRAPHIC SCALE: 1 INCH = 10 FEET

GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/12/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.29

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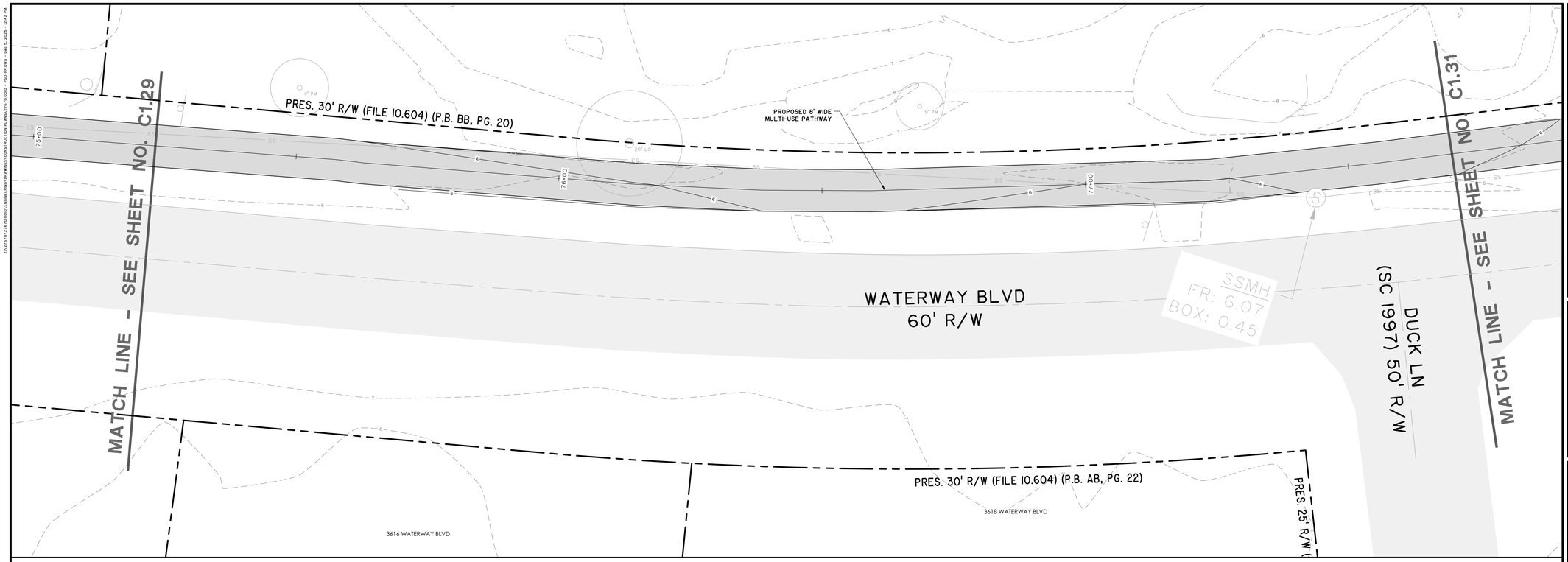

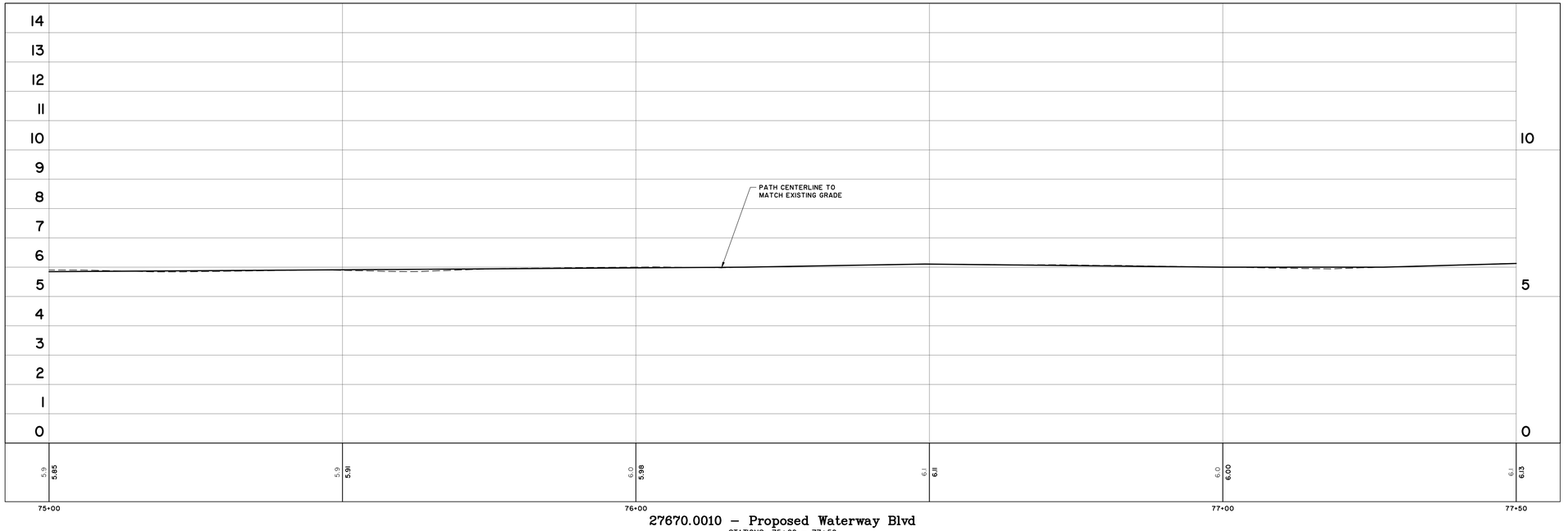

27670.0010 – Proposed Waterway Blvd
STATIONS: 75+00 – 77+50
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 11/25/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

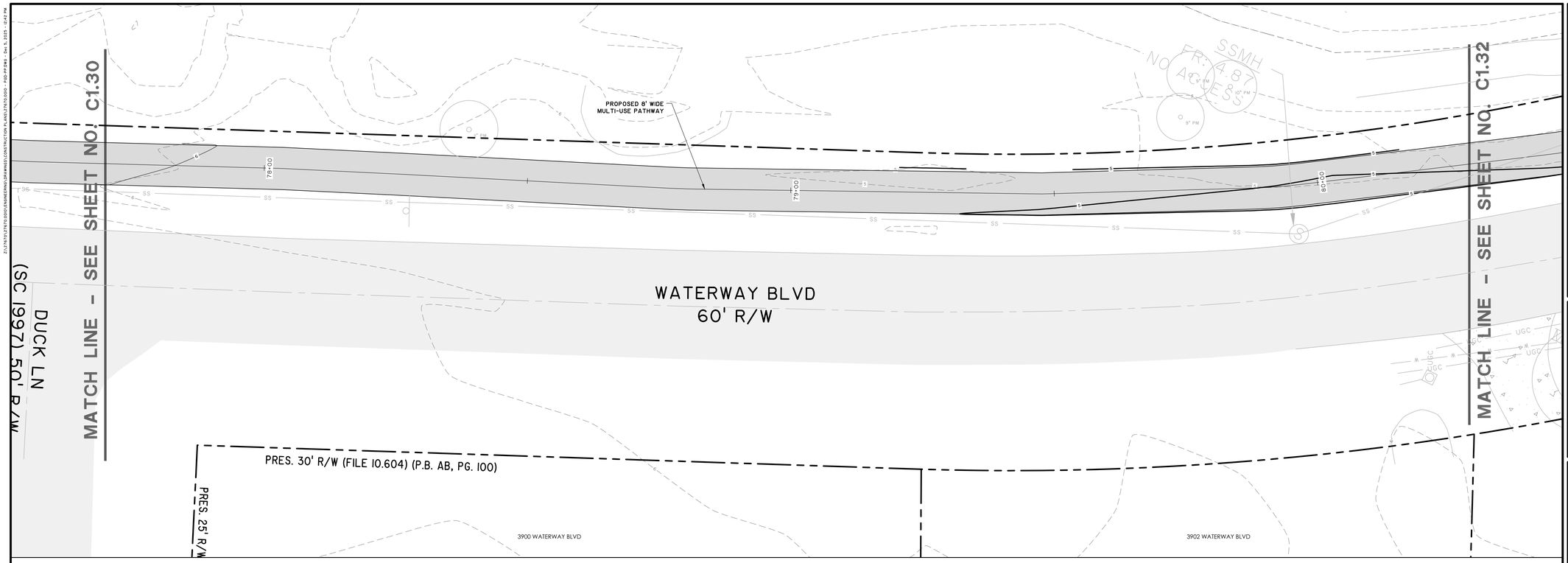
GRAPHIC SCALE: 1 INCH = 10 FEET

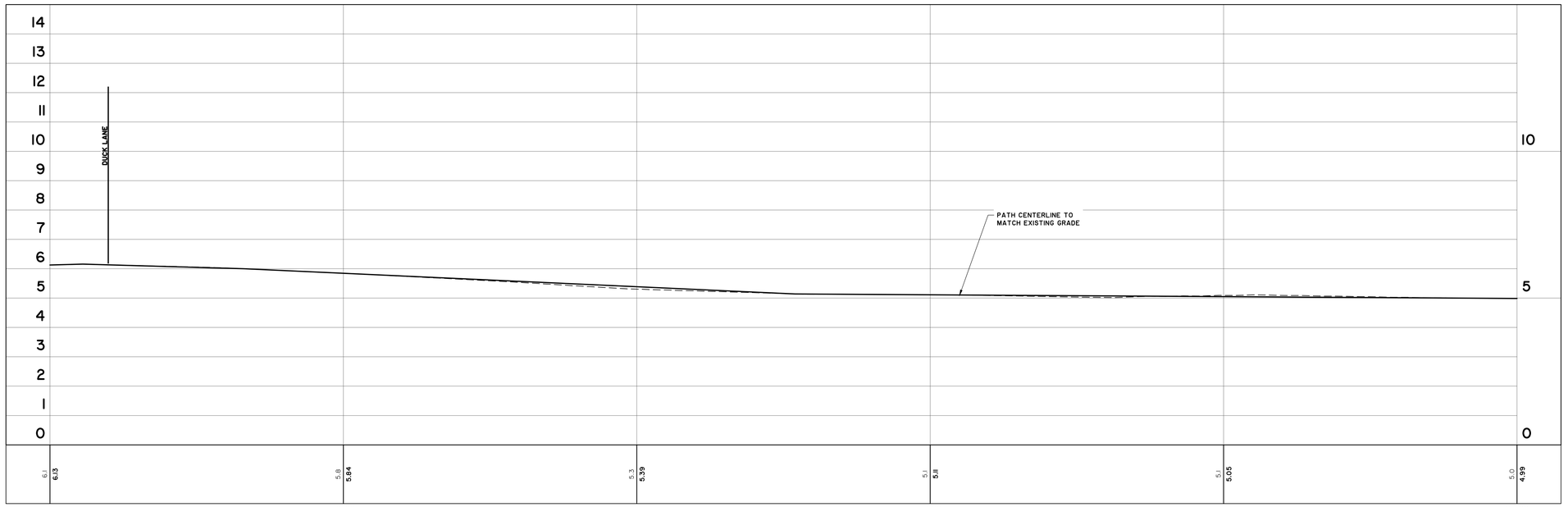
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/11/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.30





27670.0010 – Proposed Waterway Blvd
STATIONS: 77+50 – 80+00
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2025

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00285 CERTIFICATE OF AUTHORIZATION

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682 Johnnie Dodds Blvd. • Suite 100
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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

10 0 5 10
GRAPHIC SCALE:
1 INCH = 10 FEET

10 0 5 10
GRAPHIC SCALE:
1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
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DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.31

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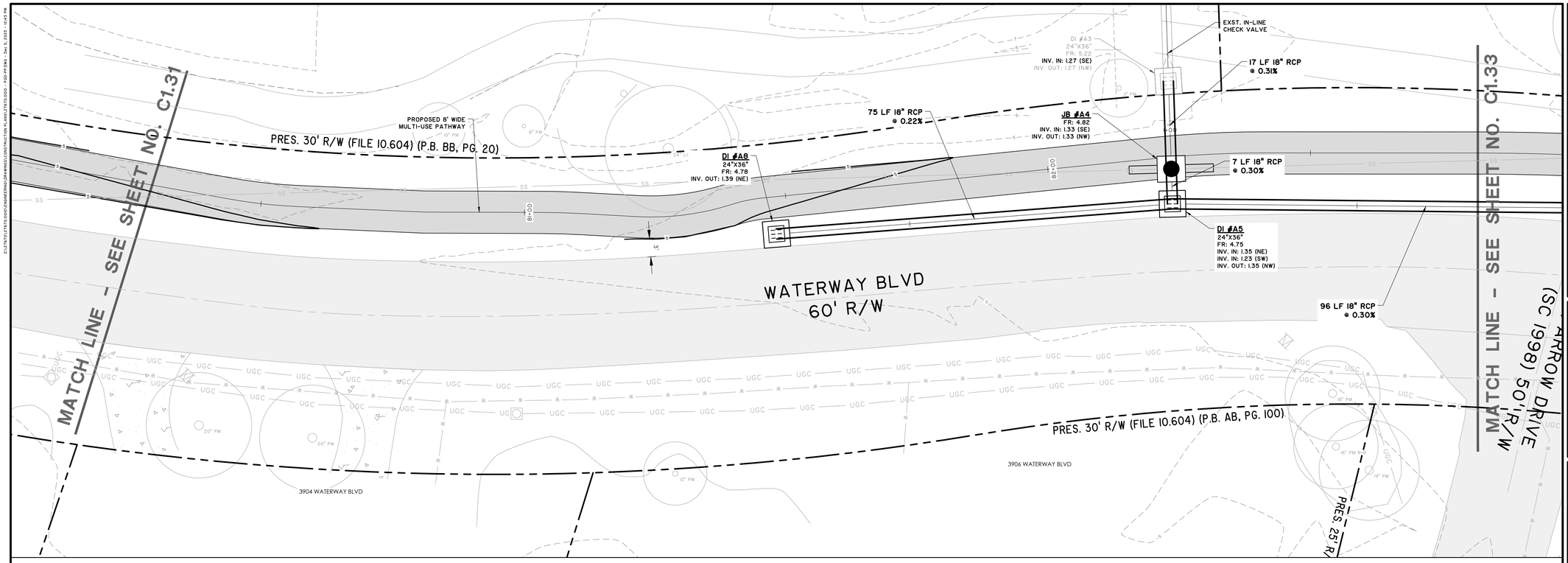

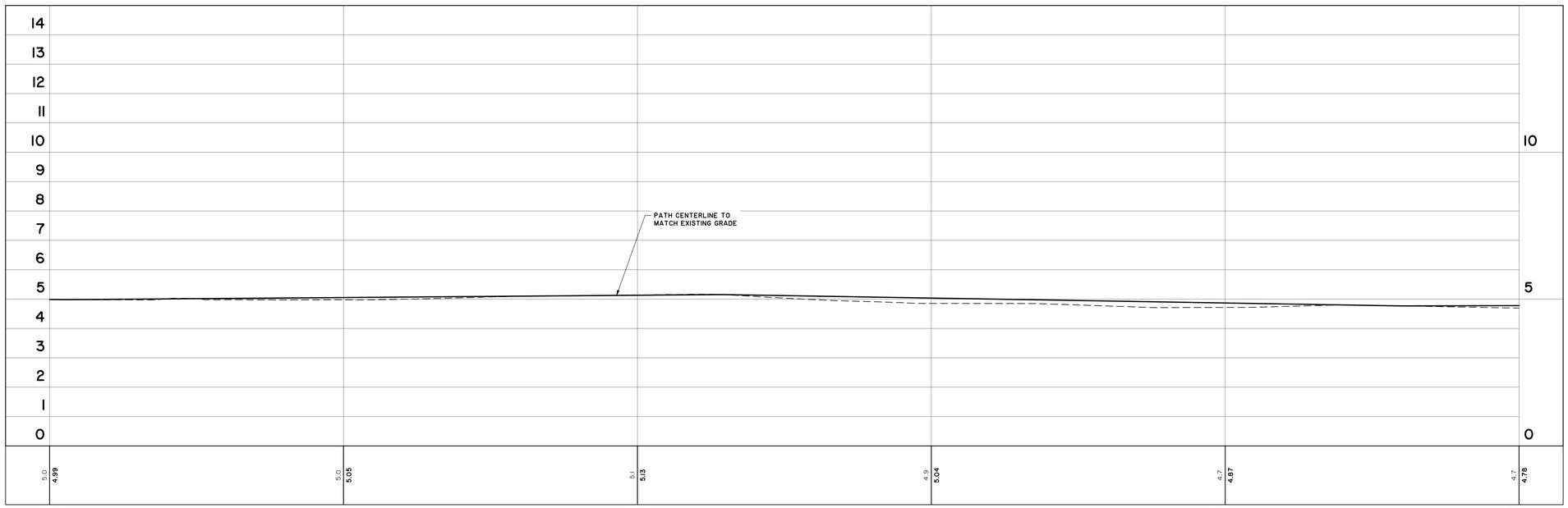

27670.0010 – Proposed Waterway Blvd
STATIONS: 80+00 – 82+50
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

10 0 5 10
GRAPHIC SCALE:
1 INCH = 10 FEET

10 0 5 10
GRAPHIC SCALE:
1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
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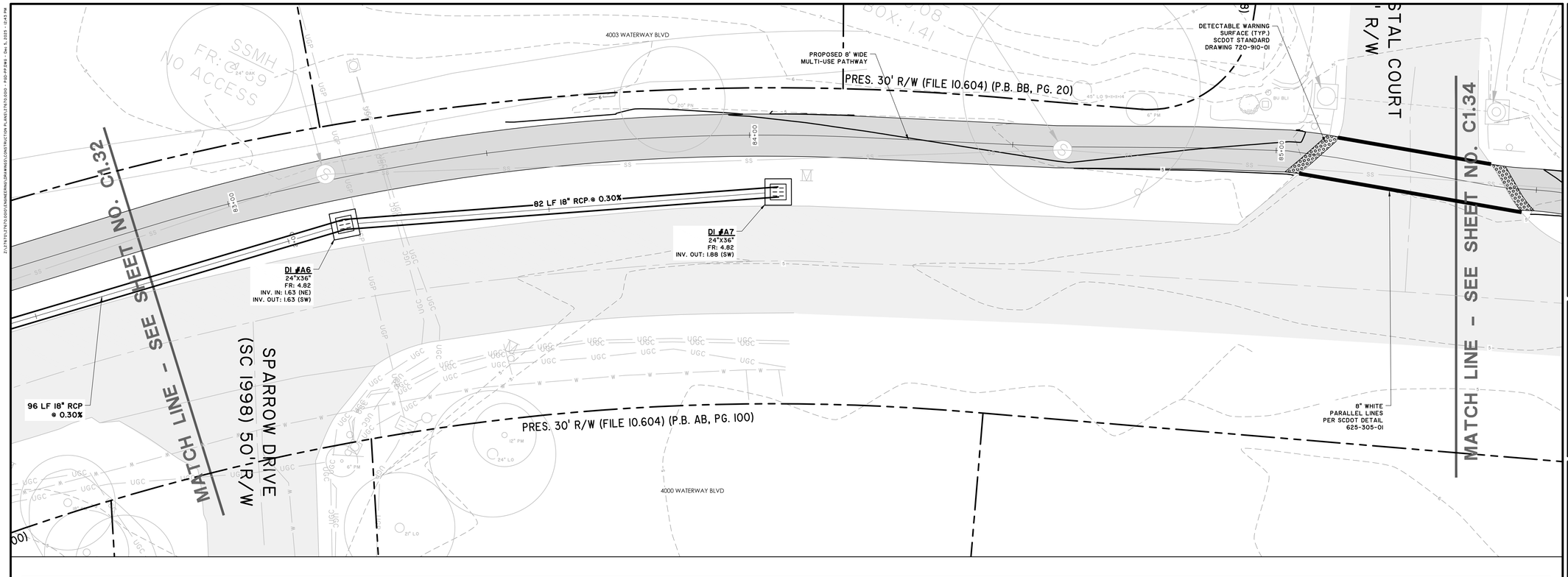
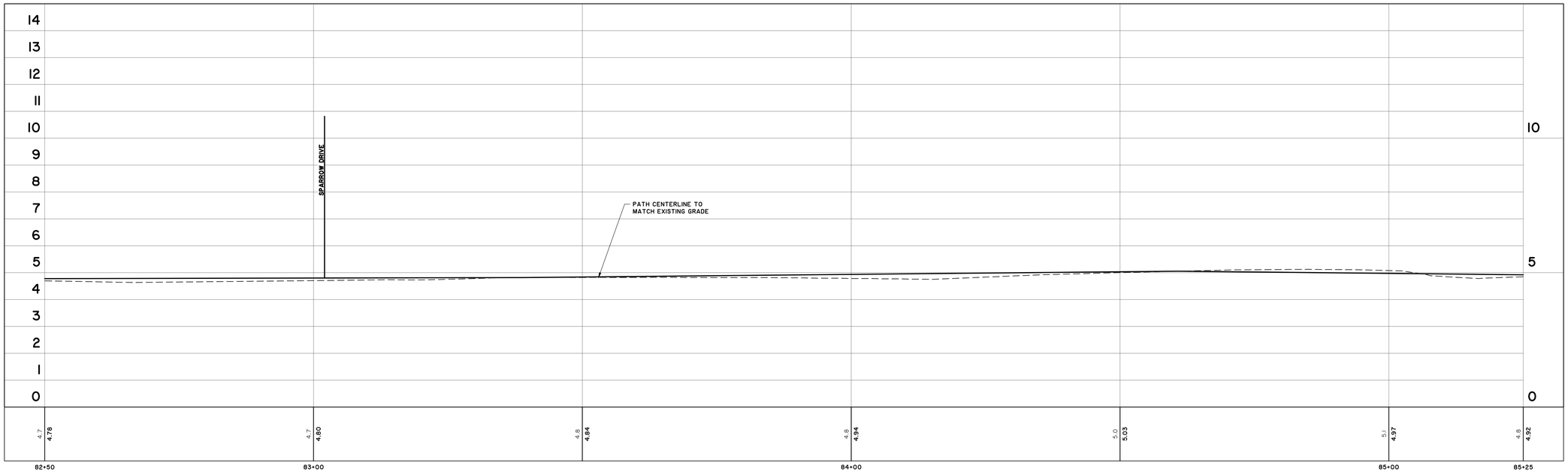
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.32





27670.0010 – Proposed Waterway Blvd
STATIONS: 82+50 – 85+25
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

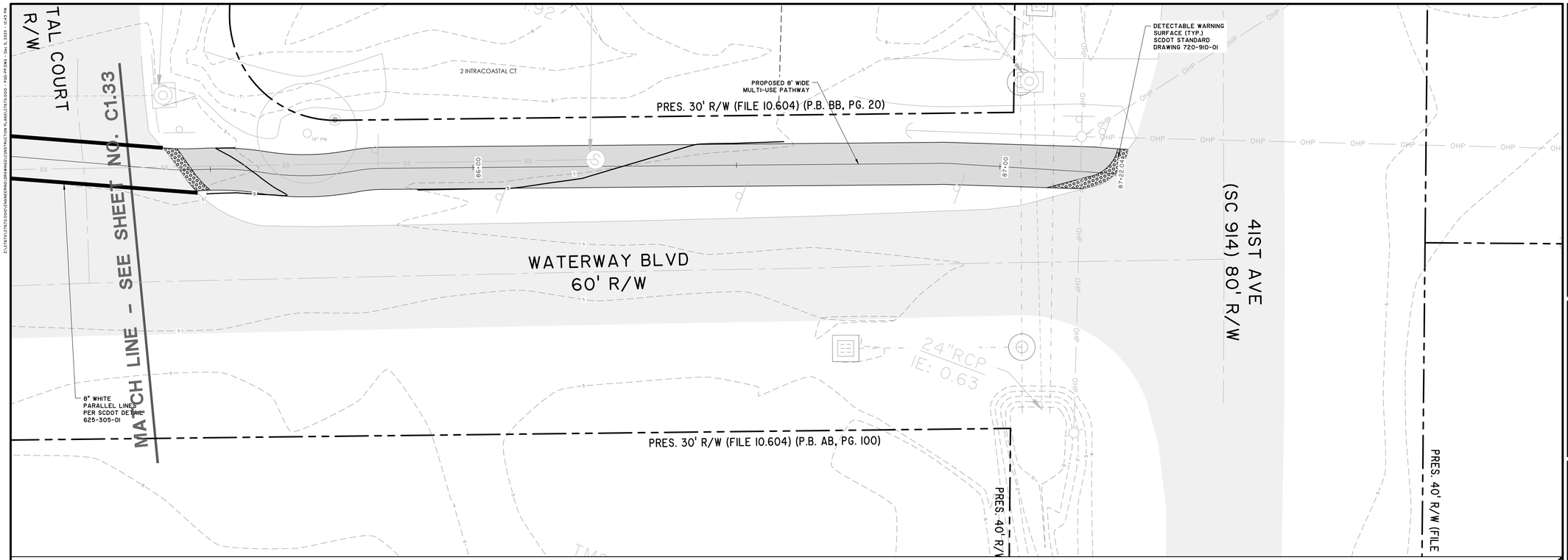
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

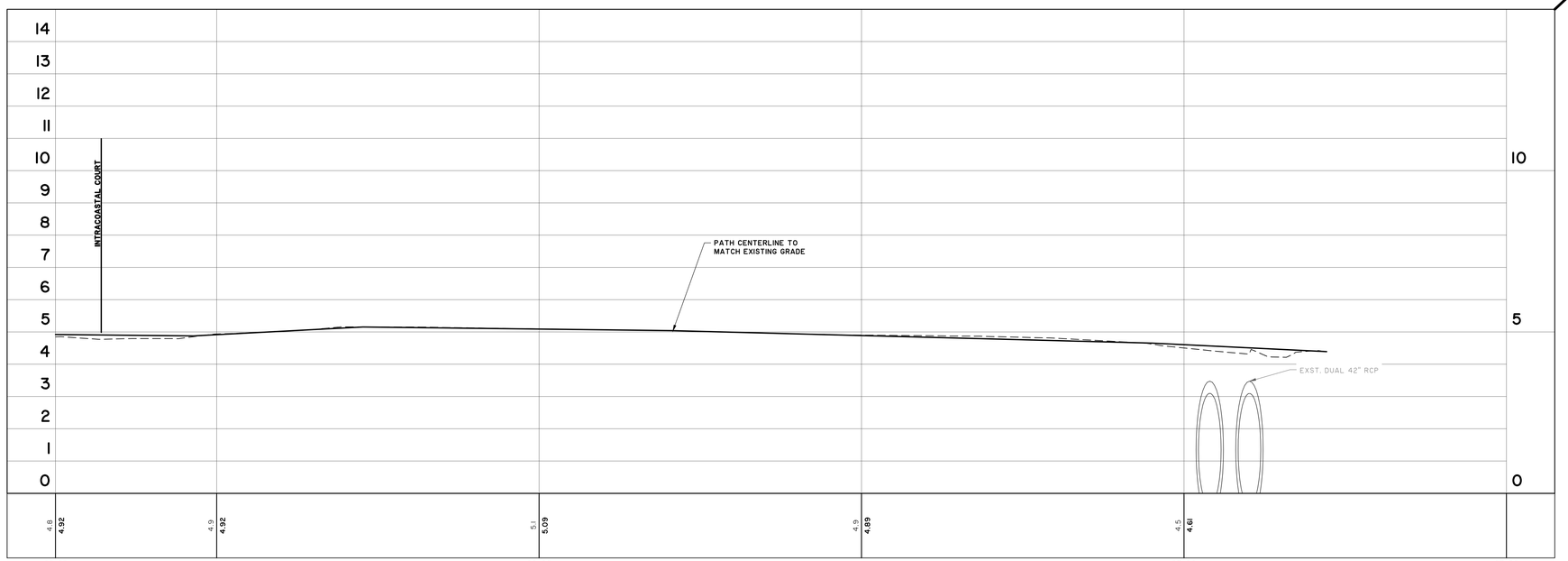
10 0 5 10
GRAPHIC SCALE: 1 INCH = 10 FEET

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/11/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	SEE SCALE BAR

C1.33





27670.0010 – Proposed Waterway Blvd
STATIONS: 85+25 – 87+50
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

THOMAS & HUTTON
682 Johnnie Dodds Blvd. • Suite 100
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PLAN & PROFILE

WATERWAY BLVD PATHWAY

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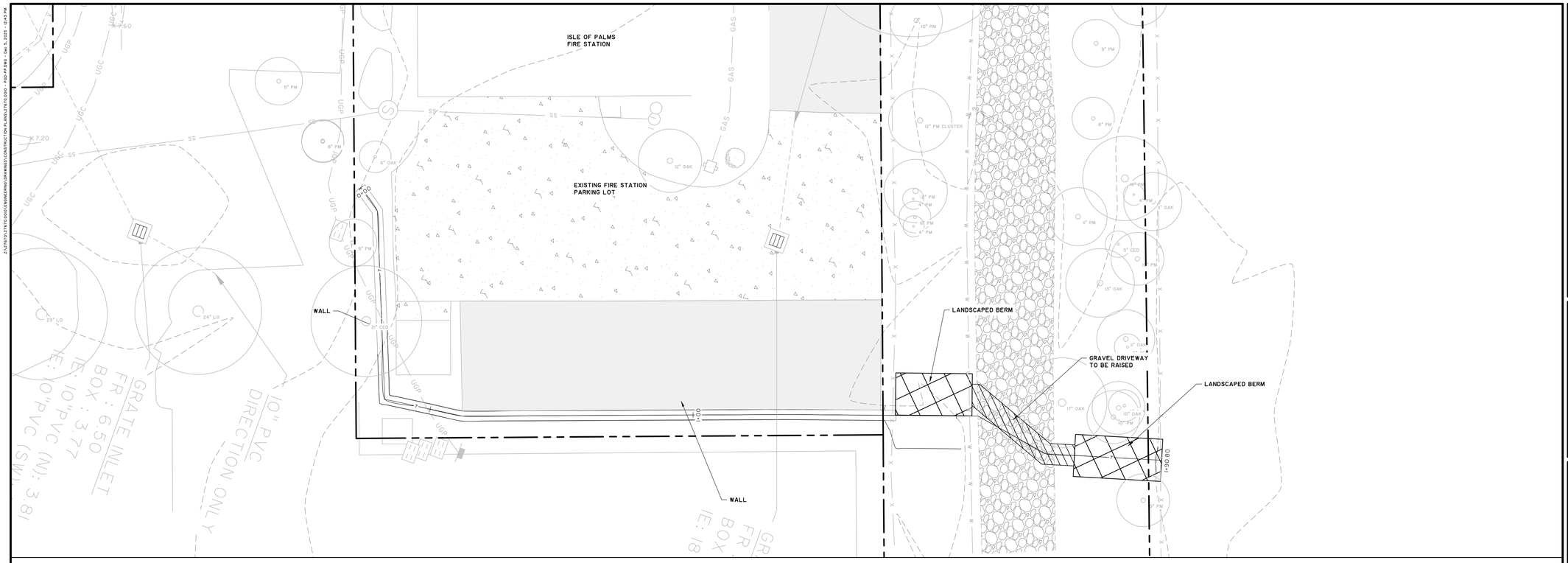
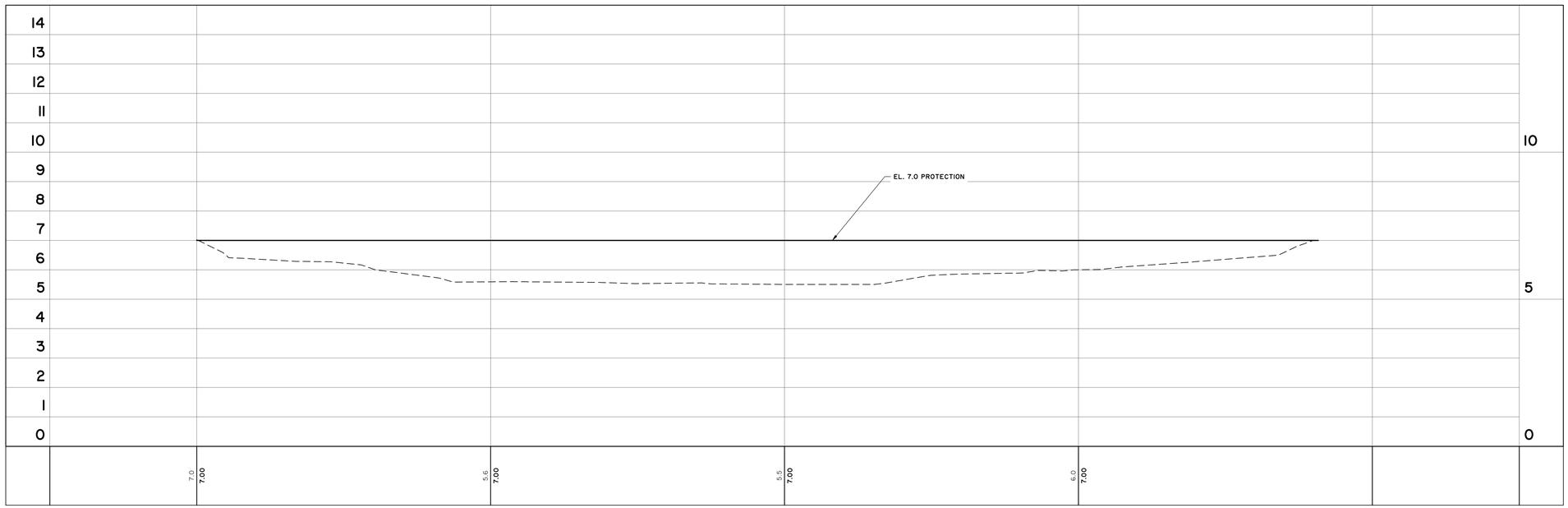
C1.34





27670.0010 – Proposed Fire Station Protection
STATIONS: -0+25 – 2+25
SCALE: HORZ.: 1" = 10'
VERT.: 1" = 2'

LEGEND

- PATHWAY FILL
- ROAD REGRADE
- PATHWAY FILL - ONE WALL

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER
No. 18837
RICHARD PETER KARNAY
12/5/2024

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PLAN & PROFILE

WATERWAY BLVD PATHWAY

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C1.35

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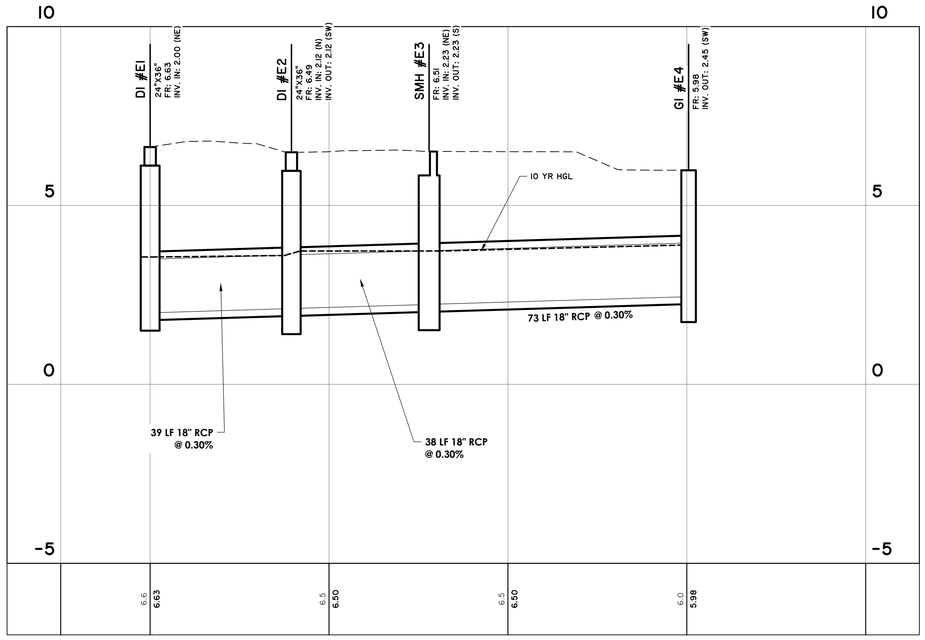
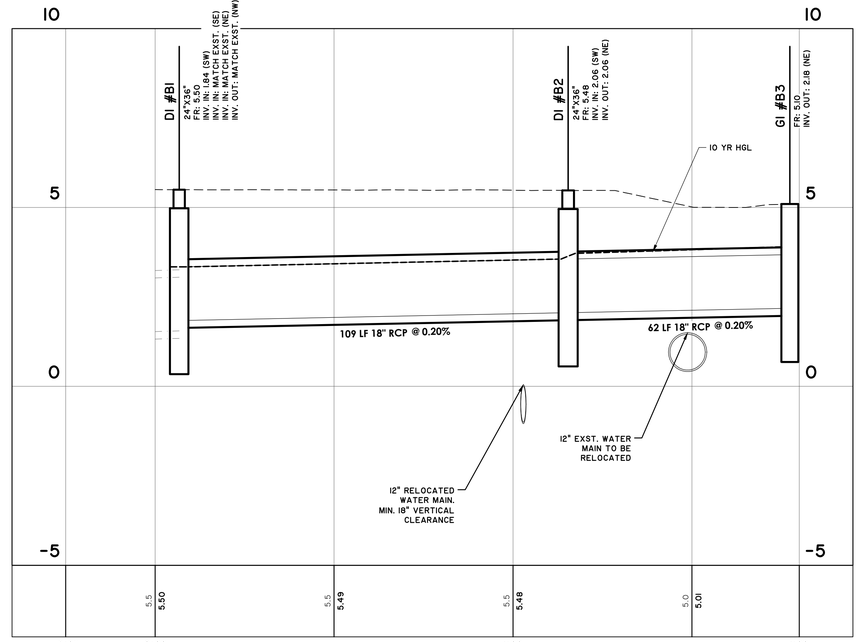
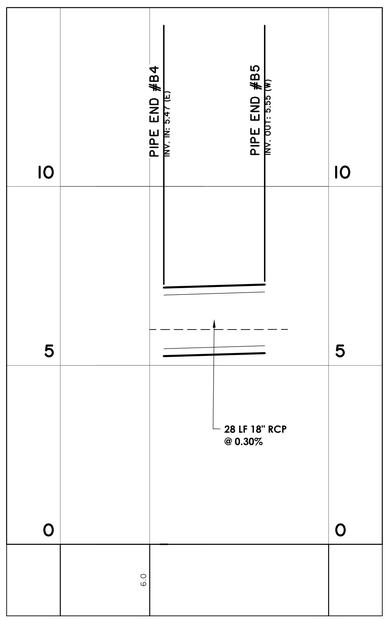


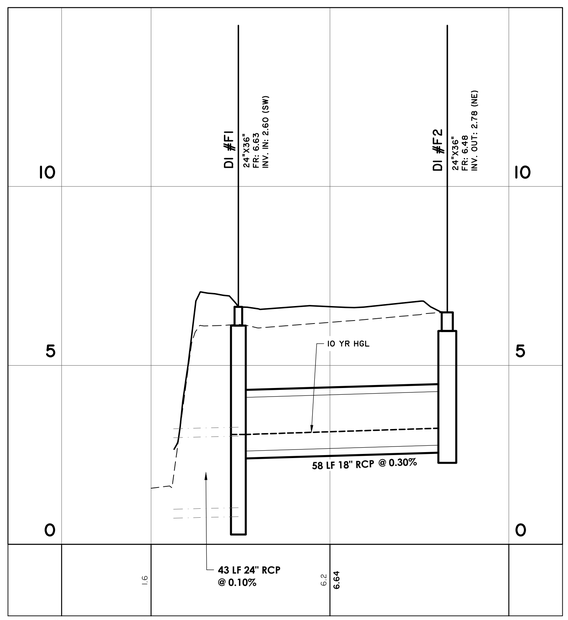
27670.0010 - Drainage - 23rd Ave.
STATIONS: -0+25 - 2+00
SCALE: HORZ.: 1" = 20'
VERT.: 1" = 2'



27670.0010 - Drainage -22nd Ave.
STATIONS: -0+25 - 1+80
SCALE: HORZ.: 1" = 20'
VERT.: 1" = 2'



27670.0010 - Drainage - Run 2
STATIONS: -0+25 - 0+50
SCALE: HORZ.: 1" = 20'
VERT.: 1" = 2'



27670.0010 - 25th Ave
STATIONS: -0+25 - 1+00
SCALE: HORZ.: 1" = 20'
VERT.: 1" = 2'

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SOUTH CAROLINA PROFESSIONAL ENGINEER
No. 18837
RICHARD PETER KARDOHNEY
12/5/2024

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DRAINAGE PROFILES

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
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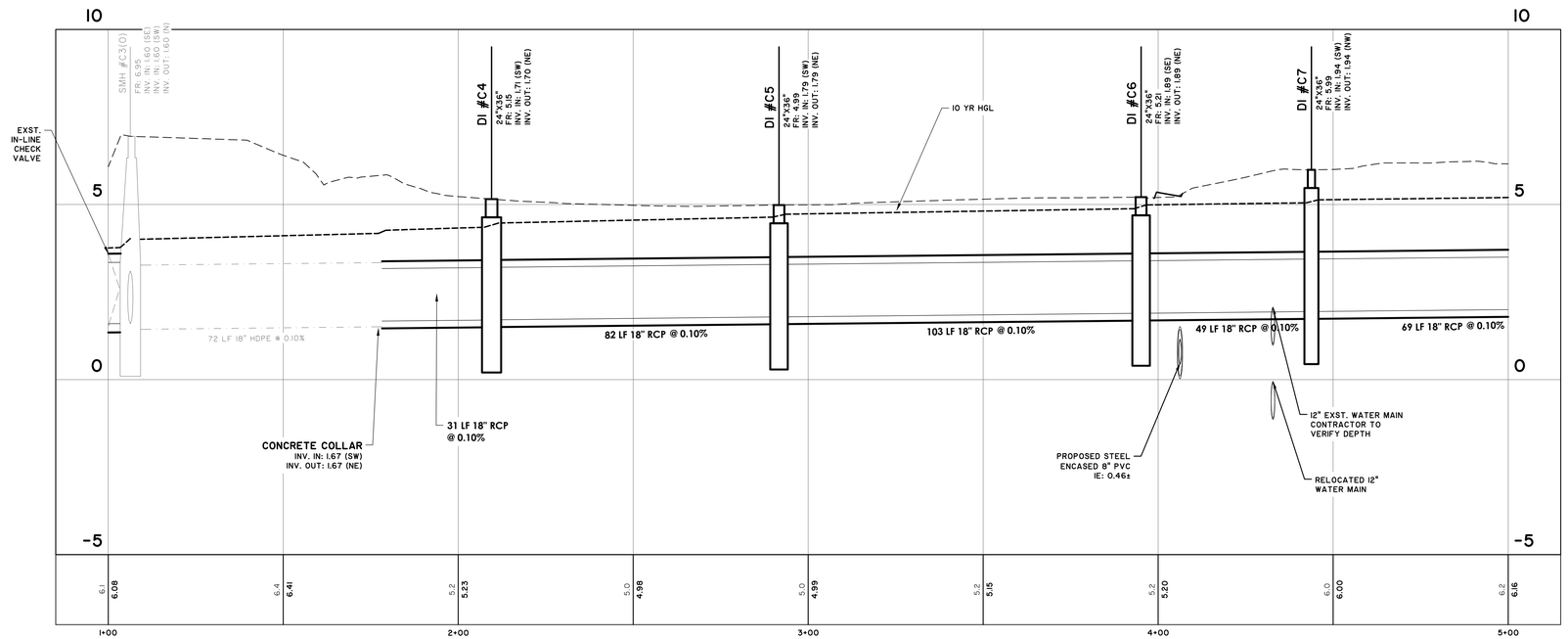
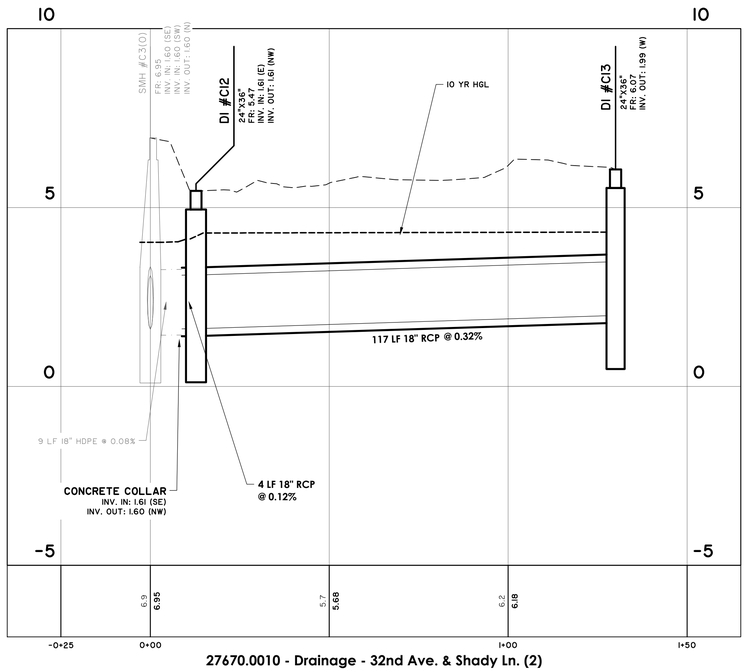
C1.37



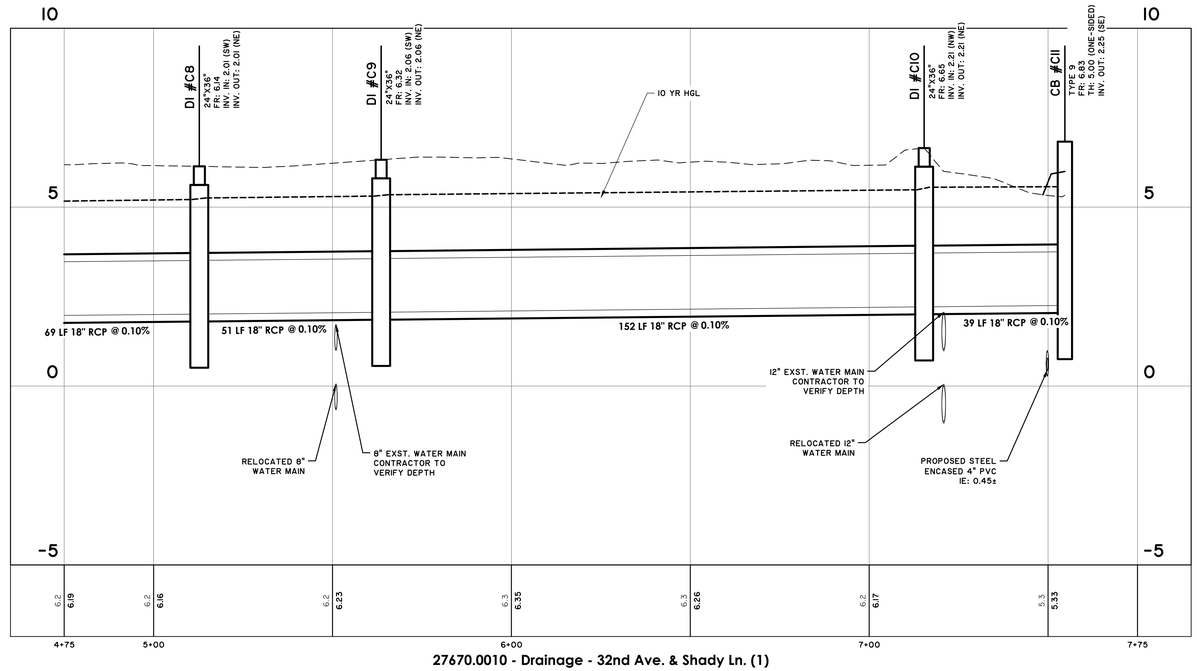
27670.0010 - Drainage - 32nd Ave. & Shady Ln. (1)

STATIONS: 1+00 - 5+00
SCALE: HORZ.: 1" = 20'
VERT.: 1" = 2'



27670.0010 - Drainage - 32nd Ave. & Shady Ln. (2)

STATIONS: -0+25 - 1+50
SCALE: HORZ.: 1" = 20'
VERT.: 1" = 2'



27670.0010 - Drainage - 32nd Ave. & Shady Ln. (1)

STATIONS: 4+75 - 7+75
SCALE: HORZ.: 1" = 20'
VERT.: 1" = 2'

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SOUTH CAROLINA PROFESSIONAL ENGINEER
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RICHARD PETER KARG
12/5/2024

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DRAINAGE PROFILES

WATERWAY BLVD PATHWAY

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C1.38

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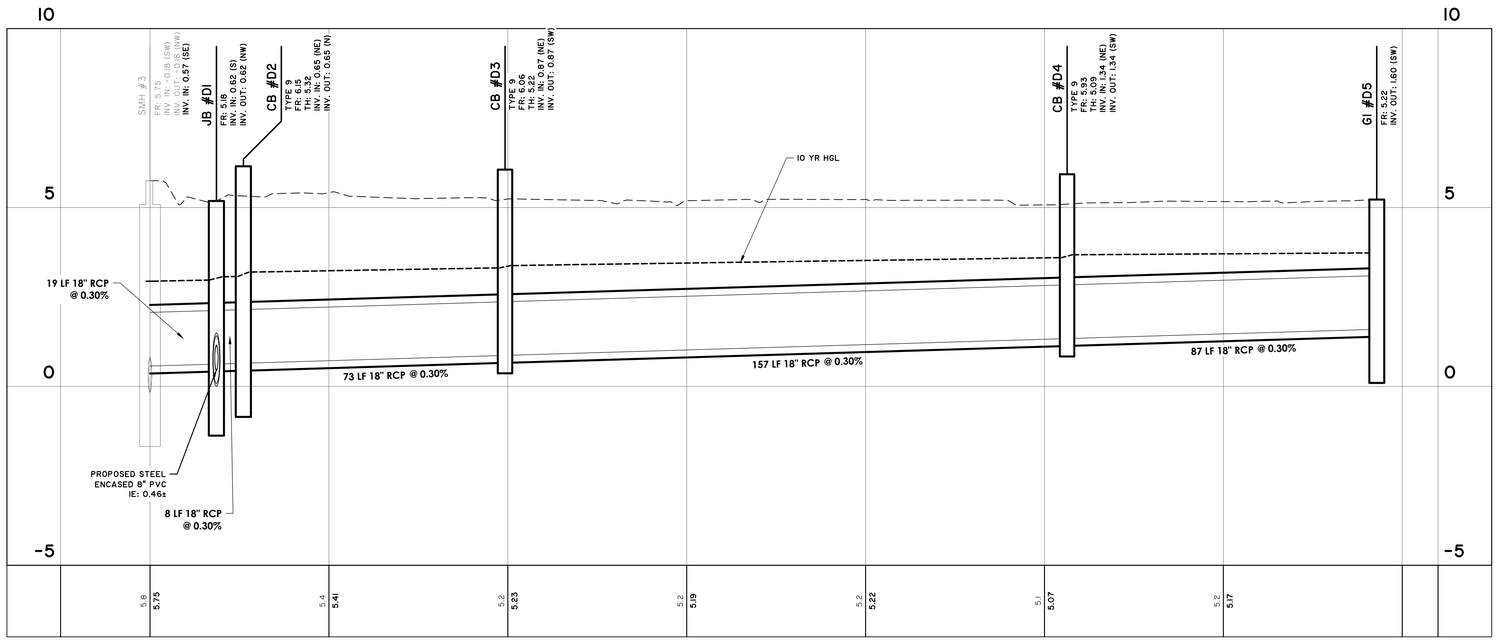
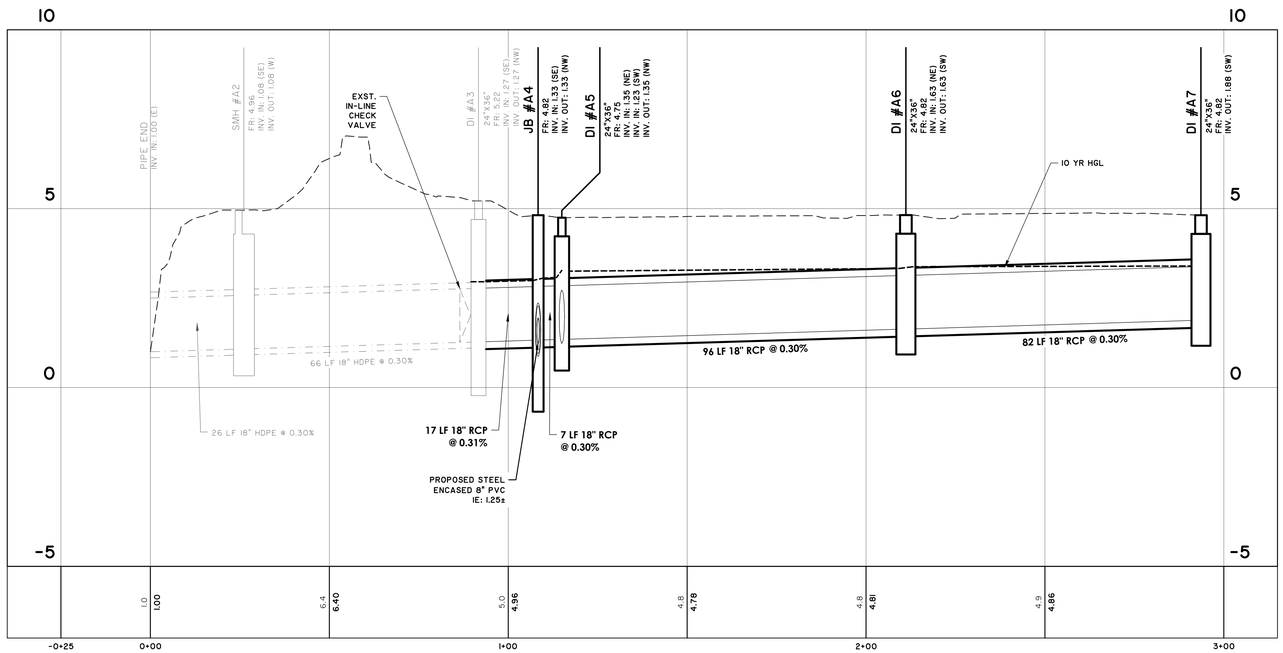
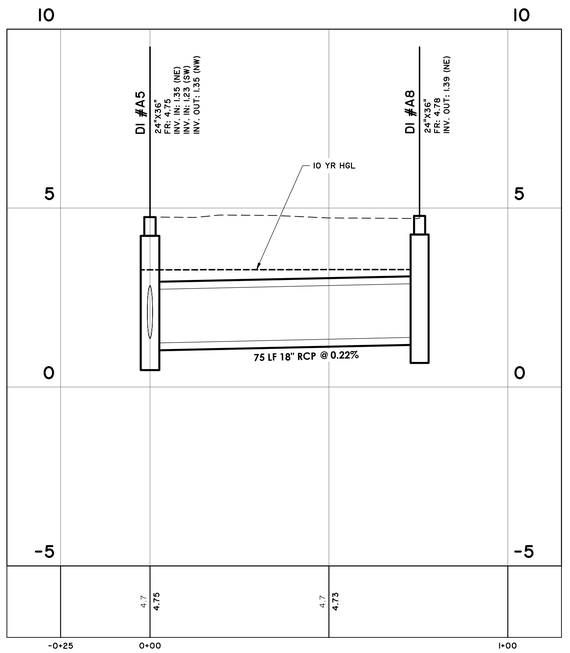


27670.0010 - Drainage - Forest Trail
STATIONS: -0+25 - 3+60
SCALE: HORZ.: 1" = 20'
VERT.: 1" = 2'



27670.0010 - Drainage - Sparrow Dr. (1)
STATIONS: -0+25 - 3+00
SCALE: HORZ.: 1" = 20'
VERT.: 1" = 2'



27670.0010 - Drainage - Sparrow Dr. (2)
STATIONS: -0+25 - 1+00
SCALE: HORZ.: 1" = 20'
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NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

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DRAINAGE PROFILES

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
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SCALE:	SEE SCALE BAR

C1.39

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NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARON 12/5/2025

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CHECK VALVE PLAN

WATERWAY BLVD PATHWAY

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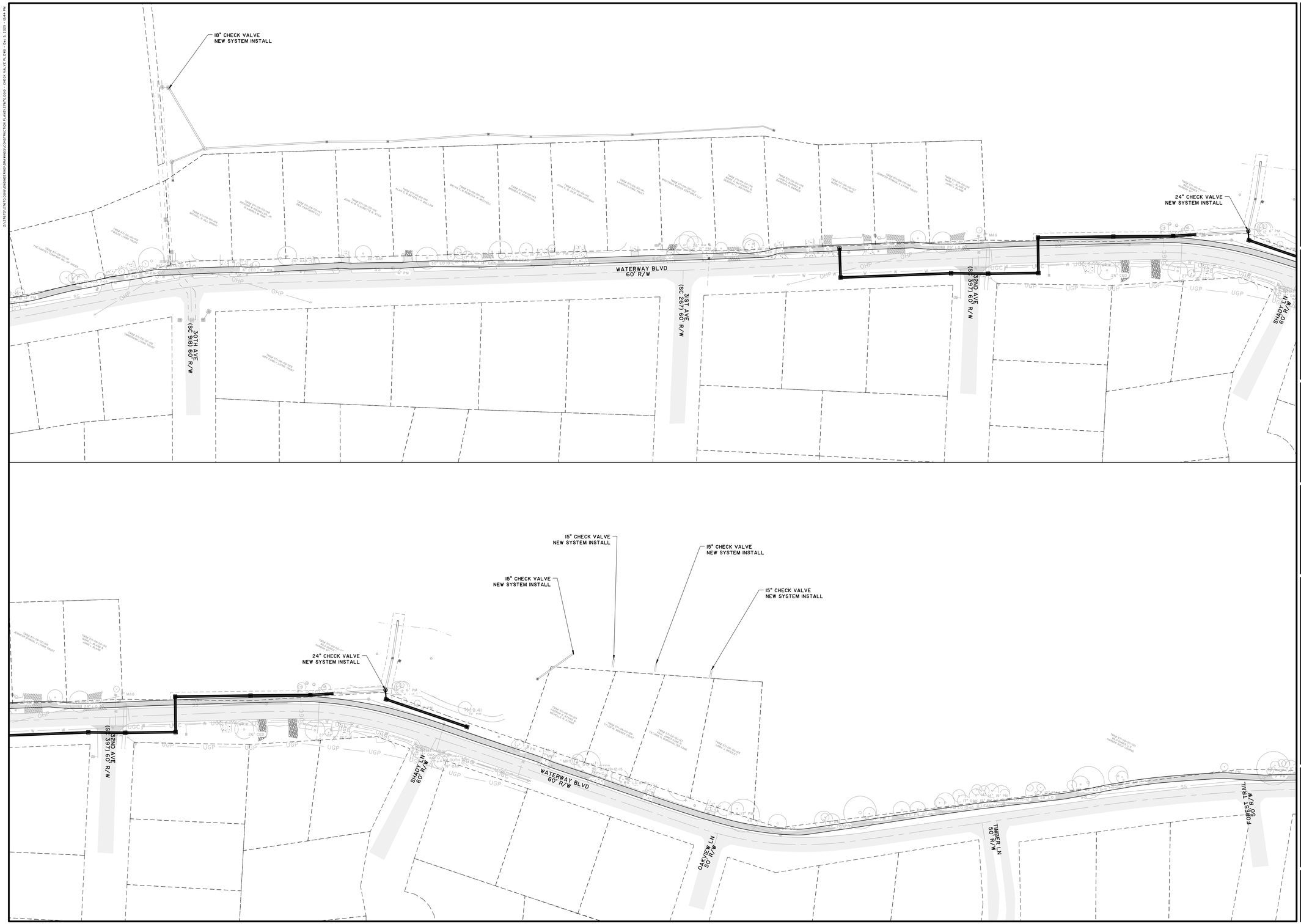

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C2.2

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C2.3

SCDOT DETAIL REFERENCE	
DETAIL #	**DETAIL NAME**
203-000-00	EXCAVATION
601-205-01	PROTECTION OF EXCAVATIONS ADJACENT TO ROADWAY
605-005-01	CONSTRUCTION SIGNING GRND. MOUNTED ASSLY. - U-CHANL. POSTS - BREAKAWAY INSTALLATION)
605-010-02	CONSTRUCTION SIGNING PERMANENT PRIMARY ROUTES
610-005-00	FLAGGING OPERATIONS TWO-LANE TWO-WAY PRIMARY & SECONDARY ROUTES
610-005-10	FLAGGING OPERATIONS TWO-LANE TWO-WAY ROADWAYS WITHOUT INTERSECTIONS
610-005-20	FLAGGING OPERATIONS WORK ZONES CONTINUING THROUGH STOP SIGN CONTROLLED SIDE ROADS
610-005-30	FLAGGING OPERATIONS WORK ZONES CONTINUING THROUGH STOP SIGN CONTROLLED INTERSECTIONS
610-010-00	LANE CLOSURE DAYTIME URBAN LOW SPEED < / = 35 MPH
610-205-00	RIGHT SHOULDER CLOSURE (CASE 1 & CASE 2) PRIMARY ROUTES
610-605-00	DETOUR SIGNING FOR PRIMARY & INTERSTATE ROUTES
610-610-00	DETOUR SIGNING FOR SECONDARY ROUTES
625-105-00	PAVEMENT EDGE MARKING AND STOP LIMITS
625-305-00	STANDARD MARKINGS FOR INTERSECTIONS
625-305-01	STANDARD MARKINGS FOR INTERSECTIONS
625-310-00	TYPICAL MARKINGS FOR TURN LANE INSTALLATIONS
625-410-00	FOR ARROWS & ONLY(S)
714-005-00	PIPE CULVERTS
714-105-00	PIPE CULVERTS RIGID PIPE COMPLETED TRENCH
719-000-01	DRAINAGE STRUCTURE GENERAL NOTES
719-000-02	DRAINAGE STRUCTURE GENERAL NOTES
719-000-03	DRAINAGE STRUCTURE GENERAL NOTES
719-000-04	DRAINAGE STRUCTURE GENERAL NOTES
719-016-01	CATCH BASIN TYPE 16
719-016-02	CATCH BASIN TYPE 16
719-110-01	DROP INLET (24" X 36") DETAILS
719-505-01	DRAINAGE ACCESS MANHOLE HEAVY DUTY DRAINAGE STRUCTURES
719-420-00	DRAINAGE SUBSTRUCTURE CIRCULAR DRAINAGE BASE AND RISER
719-505-02	DRAINAGE ACCESS MANHOLE HEAVY DUTY INLET ADAPTOR
719-550-00	DRAINAGE ACCESS STEPS FOR DRAINAGE STRUCTURES

SCDOT DETAIL REFERENCE	
DETAIL #	**DETAIL NAME**
720-105-01	CURB AND GUTTER (CONCRETE)
720-105-02	CURB AND GUTTER (CONCRETE) TRANSITION CURBS AND 3" CURB AND GUTTER
720-150-00	SIDEWALK ADJACENT TO CURB
720-160-00	SIDEWALK WITH GRASS STRIP ADJACENT TO OGEE OR VALLEY GUTTER
720-305-00	CURB & GUTTER AT INTERSECTIONS
720-410-00	DRIVEWAY WITH SEPERATED SIDEWALK WITHIN 7-4 $\frac{3}{4}$ OF CURB
720-901-01	PEDESTRIAN RAMPS GENERAL NOTES & DEFINITIONS
720-901-02	PEDESTRIAN RAMPS GENERAL NOTES & DEFINITIONS
720-901-03	PEDESTRIAN RAMPS GENERAL NOTES & DEFINITIONS
720-910-01	DETECTABLE WARNING MATERIAL WET INSET MECHANICAL ANCHORS & THREADED INSERTS
720-920-05	PEDESTRIAN RAMPS INTERSECTION
720-920-10	PEDESTRIAN RAMPS OFFSET INTERSECTION
720-929-01	PEDESTRIAN RAMP STANDARD VARIANTS
720-929-02	PEDESTRIAN RAMP STANDARD VARIANTS
720-951-11	PEDESTRIAN RAMP NO GRASS (PARALLEL RAMP)
720-952-11	PEDESTRIAN RAMP CONDENSED TERMINAL (PARALLEL RAMP)
720-954-40	PEDESTRIAN REFUGE RAISED CONCRETE MEDIAN WITH CHANNELIZED TURN LANE
720-955-40	PEDESTRIAN REFUGE RAISED CONCRETE ISLAND
804-310-00	OUTLET PROTECTION WITH DEFINED CHANNEL

*CONTRACTOR TO REFER TO MOST CURRENT EDITION OF THE SCDOT STANDARD DRAWINGS.

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARG 12/5/2024

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SCDOT DETAILS

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
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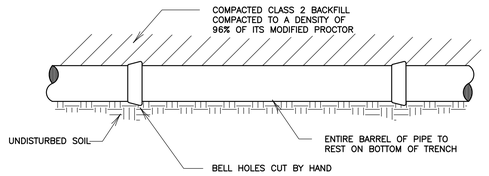
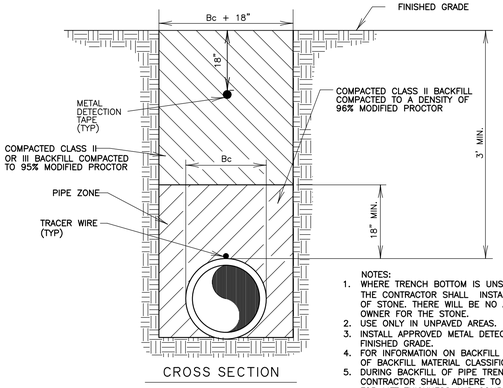
C3.1



LONGITUDINAL SECTION



CROSS SECTION

NOTES:
1. WHERE TRENCH BOTTOM IS UNSUITABLE TO SUPPORT PIPE, THE CONTRACTOR SHALL INSTALL PIPE ON A MIN. 4" BED OF STONE. THERE WILL BE NO ADDITIONAL COST TO THE OWNER FOR THE STONE.
2. USE ONLY IN UNPAVED AREAS.
3. INSTALL APPROVED METAL DETECTION TAPE 18" FROM FINISHED GRADE.
4. FOR INFORMATION ON BACKFILL MATERIAL SEE DESCRIPTION OF BACKFILL MATERIAL CLASSIFICATION THIS SHEET.
5. DURING BACKFILL OF PIPE TRENCHES IN PAVED AREAS, CONTRACTOR SHALL ADHERE TO ALL SCDOT REQUIREMENTS FOR LIFT THICKNESS AND COMPACTION STANDARDS PER THE SCDOT 2007 STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
6. TRACER WIRE AND METAL DETECTION TAPE SHALL CONFORM TO IOPWSC SPECIFICATIONS AND REQUIREMENTS.

DESCRIPTION OF BACKFILL MATERIAL CLASSIFICATION
UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

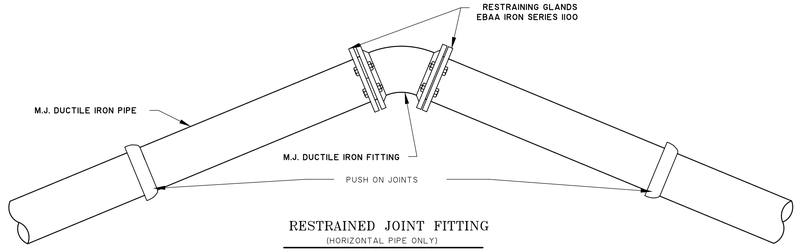
SOIL CLASS	SOIL TYPE (USCS)	DESCRIPTION OF MATERIAL CLASSIFICATION
CLASS I SOILS*	——	MANUFACTURED ANGULAR, GRANULAR MATERIAL, 1/4 TO 1-1/2 INCHES (6 TO 40 mm) SIZE, INCLUDING MATERIALS HAVING REGIONAL SIGNIFICANCE SUCH AS CRUSHED STONE OR ROCK, BROKEN CORAL, CRUSHED SLAG, CINDERS, OR CRUSHED SHELLS.
CLASS II SOILS**	GW	WELL-GRADED GRAVELS AND GRAVEL-SAND MIXTURES, LITTLE OR NO FINES. 50% OR MORE RETAINED ON NO. 4 SIEVE. MORE THAN 95% RETAINED ON NO. 200 SIEVE. CLEAN.
	GP	POORLY GRADED GRAVELS AND GRAVEL-SAND MIXTURES, LITTLE OR NO FINES. 50% OR MORE RETAINED ON NO. 4 SIEVE. MORE THAN 95% RETAINED ON NO. 200 SIEVE. CLEAN.
	SW	WELL-GRADES SANDS AND GRAVELY SANDS, LITTLE OR NO FINES. MORE THAN 50% PASSES NO. 4 SIEVE. MORE THAN 95% RETAINED ON NO. 200 SIEVE. CLEAN.
	SP	POORLY GRADED SANDS AND GRAVELY SANDS, LITTLE OR NO FINES. MORE THAN 50% PASSES NO. 4 SIEVE. MORE THAN 95% RETAINED ON NO. 200 SIEVE. CLEAN.
CLASS III SOILS***	GM	SILTY GRAVELS, GRAVEL-SAND MIXTURES. 50% OR MORE RETAINED ON NO. 4 SIEVE. MORE THAN 50% RETAINED ON NO. 200 SIEVE.
	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES. 50% OR MORE RETAINED ON NO. 4 SIEVE. MORE THAN 50% RETAINED ON NO. 200 SIEVE.
	SM	SILTY SANDS, SAND-SILT MIXTURES. MORE THAN 50% PASSES NO. 4 SIEVE. MORE THAN 50% RETAINED ON NO. 200 SIEVE.
	SC	CLAYEY SANDS, SAND-CLAY MIXTURES. MORE THAN 50% PASSES NO. 4 SIEVE. MORE THAN 50% RETAINED ON NO. 200 SIEVE.
CLASS IV SOILS	ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS. LIQUID LIMIT 50% OR LESS. 50% OR MORE PASSES NO. 200 SIEVE.
	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS. LIQUID LIMIT 50% OR LESS. 50% OR MORE PASSES NO. 200 SIEVE.
	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDS OR SILTS, ELASTIC SILTS. LIQUID LIMIT GREATER THAN 50%. 50% OR MORE PASSES NO. 200 SIEVE.
	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS. LIQUID LIMIT GREATER THAN 50%. 50% OR MORE PASSES NO. 200 SIEVE.
CLASS V SOILS	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY. LIQUID LIMIT 50% OR LESS. 50% OR MORE PASSES NO. 200 SIEVE.
	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY. LIQUID LIMIT GREATER THAN 50%. 50% OR MORE PASSES NO. 200 SIEVE.
	PT	PEAT, MUCK AND OTHER HIGHLY ORGANIC SOILS.

*SOILS DEFINED AS CLASS I MATERIALS ARE NOT DEFINED IN ASTM D2487.
**IN ACCORDANCE WITH ASTM D2487, LESS THAN 5% PASS NO. 200 SIEVE.
***IN ACCORDANCE WITH ASTM D2487, MORE THAN 12% PASS NO. 200 SIEVE. SOILS WITH 5% TO 12% NO. 200 SIEVE FALL IN BORDERLINE CLASSIFICATION, E.G., GP-GC.

MAXIMUM TRENCH WIDTHS	
Bc – PIPE SIZE	WIDTH
2"	20"
2 1/2"	22"
3"	24"
4"	28"
6"	30"

MAXIMUM TRENCH WIDTHS	
Bc – PIPE SIZE	WIDTH
8"	30"
10"	32"
12"	34"
14"	34"
16"	36"

1 C4.2 TYPICAL WATER LINE BEDDING DETAIL
NOT TO SCALE



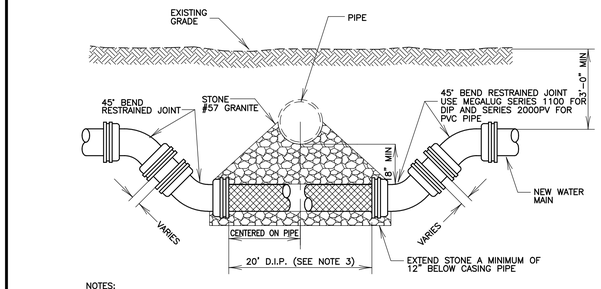
RESTRAINED JOINT FITTING
(HORIZONTAL PIPE ONLY)
NOT TO SCALE

NOTES:
1. THE FOLLOWING CONDITIONS WERE USED TO CALCULATE THE RESTRAINED LENGTHS:
   LAYING CONDITION IS TYPE 3;
   SOIL DESIGNATED AS SAND–SILT;
   DEPTH IS 3 FT.;
   DESIGN PRESSURE (TEST) IS 150 PSI;
   SAFETY FACTOR IS 1.5.
2. FOR THE TEE (EACH LEG) AND REDUCER, LENGTHS ARE BASED ON BRANCHING AND REDUCING FROM THE NEXT LARGER SIZE IN THE TABLE. DEVIATIONS FROM THESE CONDITIONS MUST BE BASED ON THE ABOVE PARAMETERS.
3. FOR DUCTILE IRON PIPE PUSH ON JOINTS, GRIP RING TYPE PIPE MAY BE USED. FOR PVC PUSH ON JOINT HARNESS RESTRAINT (EBAA SERIES 1500 OR APPROVED EQUAL) SHALL BE INSTALLED WITHIN THE MINIMUM DISTANCES (BOTH SIDES OF FITTING) SPECIFIED IN THE TABLE BELOW. THE SUPPLY AND INSTALLATION OF THE HARNESS RESTRAINTS SHALL BE CONSIDERED INCIDENTAL TO THE PIPE INSTALLATION AND NO SEPARATE PAYMENT WILL BE MADE FOR THE HARNESS RESTRAINTS.
4. CONTRACTOR SHALL RESTRAIN ALL EXISTING JOINTS UPSTREAM AND DOWNSTREAM OF PROPOSED VERTICAL OFFSETS TO THE EXTENT OF THE RESTRAINED LENGTHS NOTED IN THIS TABLE, BASED ON THE SIZE OF THE EXISTING WATER MAIN AND BASED ON THE "DEAD END" COLUMN. RESTRAINT OF EXISTING PIPE JOINTS IS CONSIDERED ANCILLARY OF THE UTILITY RELOCATION WORK, AND NO SEPARATE PAYMENT WILL BE MADE FOR RESTRAINT OF THE EXISTING PIPE JOINTS.

RESTRAINED JOINT TABLE
LENGTH OF RESTRAINED JOINT REQUIRED
(IN L.F. EACH SIDE OF THE BEND OR FITTING)

SIZE	11 1/4°	22 1/2°	45°	90°	TEE (EACH LEG)	DEAD END	REDUCER	VALVE
4"	2	5	10	24	37	60	44	60
6"	3	7	14	33	64	85	46	85
8"	4	9	18	43	90	110	46	110
10"	5	10	21	51	113	133	50	133
12"	10	20	30	60	140	160	60	160

2 C4.2 RESTRAINED JOINT FITTING
NOT TO SCALE

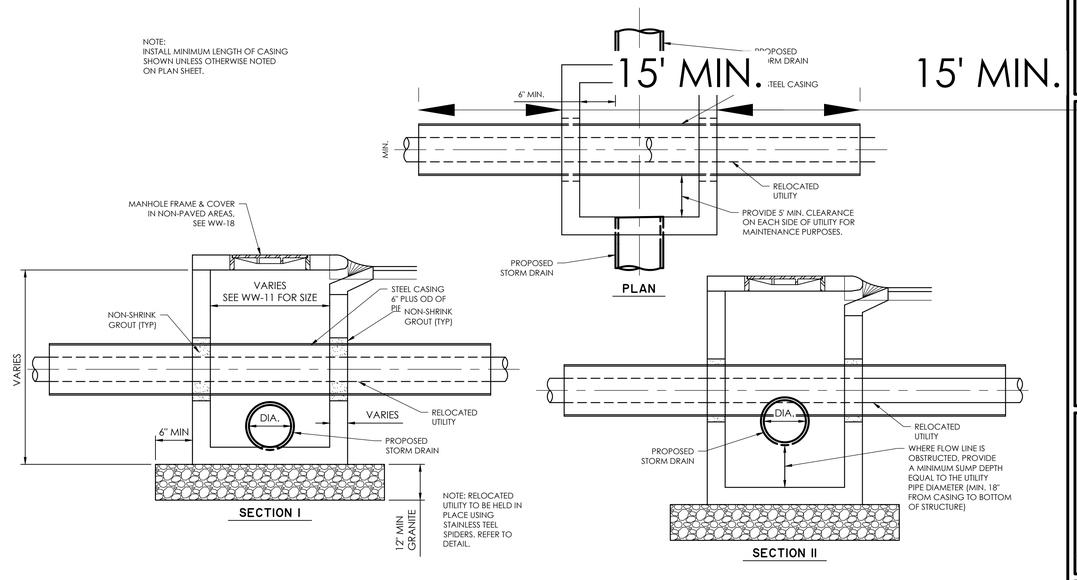


NOTES:
1. ALL SECTIONS OF THE VERTICAL OFFSET SHALL BE CONSTRUCTED OF CL 350 DUCTILE IRON PIPE, AND ALL JOINTS AND FITTINGS SHALL BE MECHANICALLY RESTRAINED. IN ADDITION TO RESTRAINED JOINTS, USE TIE-RODS OR REACTION BLOCKS FOR SUPPORT.
2. WHERE VERTICAL OFFSETS OF WATER LINES ARE REQUIRED TO BE LOCATED UNDER EXISTING OR PROPOSED DRAINAGE PIPES, CONTRACTOR SHALL INSTALL WATER MAIN WITHIN A MINIMUM 20-FOOT LENGTH OF STEEL CASING (MINIMUM 0.375" THICKNESS) WITH A DIAMETER THAT IS A MINIMUM OF 6" LARGER THAN THE WATER MAIN DIAMETER. SPACERS SHALL BE INSTALLED TO CENTER THE PIPE WITH THE CASING. MAXIMUM DISTANCE BETWEEN SPACERS IS 4'-0" ON CENTER. STEEL CASING MUST BE GROUTED AT BOTH ENDS AROUND THE NEW WATER MAIN.
3. FOR CONNECTIONS TO EXISTING WATER MAINS WHERE HORIZONTAL SEPARATION BETWEEN THE EXISTING MAIN AND DRAINAGE PIPE IS LESS THAN 10 FEET, CONTRACTOR MAY REDUCE THE LENGTH SHOWN TO ACCOMMODATE THE VERTICAL OFFSET OF THE WATER MAIN. MINIMUM VERTICAL SEPARATION OF 18" SHALL BE MAINTAINED DIRECTLY UNDER THE DRAIN PIPE. MINIMUM SEPARATION FOR OTHER SECTIONS OF THE VERTICAL OFFSET IS 12".

4 C4.2 WATER MAIN CROSSING UNDER PIPE
NOT TO SCALE

ALL SECTIONS OF THE VERTICAL OFFSET SHALL BE CONSTRUCTED OF CL 350 DUCTILE IRON PIPE, AND ALL JOINTS AND FITTINGS SHALL BE MECHANICALLY RESTRAINED.

NOTE:
INSTALL MINIMUM LENGTH OF CASING SHOWN UNLESS OTHERWISE NOTED ON PLAN SHEET.



4 C5.2 CONFLICT BOX DETAIL
NOT TO SCALE

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18637 RICHARD PETER KARNOW 12/5/2024

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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

WATER AND SEWER DETAILS

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

DATUM: HORIZ.: VERT.:

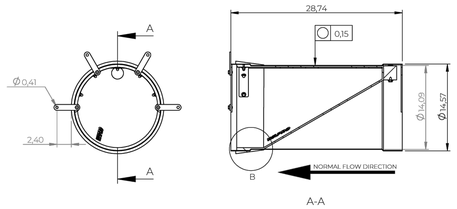
JOB NO:	27670.0010
DATE:	11/11/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	1" = 1'

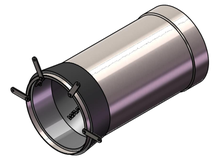
C3.2

Z:\27670.0010\DESIGN\ENGINEERING\DRAWINGS\CONSTRUCTION PLANS\27670.0010 - ROUTE.DWG - Dec 5, 2024 - 12:44 PM

Z:\27670.0010\DESIGN\ENGINEERING\CAD\MARCH\CONVERSION\MARCH_ATOLST.DWG - Dec 3, 2019 - 12:34PM

Rev	Note	Createdby	Appr.By	Appr.Date
A	Initial release	HE	AE	2019-12-10





Designed By	Approved By	Created Date	Units	General Tolerance	Scale
FC		2020-03-23	[inch]	ISO 13920A	1:12

Material	Project	Comments
AISI 316L / EN1.4404		

Weight [Lbs]	Box Volume [ft³]	Description
42,11		WaStop NPS 15"

WAPRO
www.wapro.com

Article Number	Drawing Number	Rev	Sheet
WS370-S	ws370-s-us	A	1 (1)

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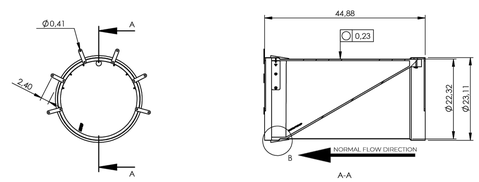
Rev	Note	Createdby	Appr.By	Appr.Date
A	Initial release		AE	2019-07-10



Designed By	Approved By	Created Date	Units	General Tolerance	Scale
HE	AE	2019-12-16	[inch]	ISO 13920A	1:20

Material	Comments	Project
AISI 304 / AISI 316L		

Weight [Lbs]	Box Volume [ft³]	Description
115,2	14,8	WaStop NPS 24"

WAPRO
www.wapro.com

Article Number	Drawing Number	Rev	Sheet
WS590-S	ws590-s-us	A	1 (1)

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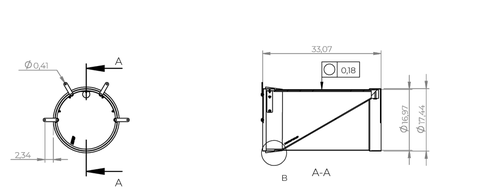
Rev	Note	Createdby	Appr.By	Appr.Date
A	Initial release	HE		



Designed By	Approved By	Created Date	Units	General Tolerance	Scale
HE		2019-12-11	[inch]	ISO 13920A	1:20

Material	Project	Comments
AISI 304 / AISI 316L		

Weight [Lbs]	Box Volume [ft³]	Description
56,42	5.8	WaStop NPS 18"

WAPRO
www.wapro.com

Article Number	Drawing Number	Rev	Sheet
WS440-S	ws440-s-us	A	1 (1)

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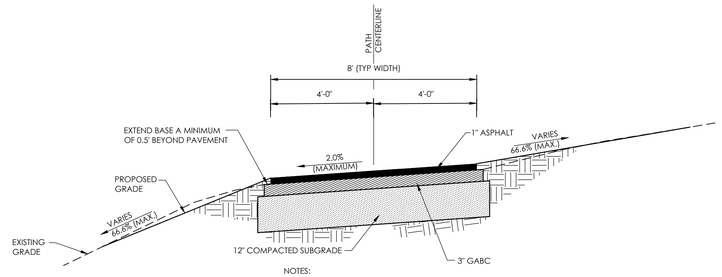
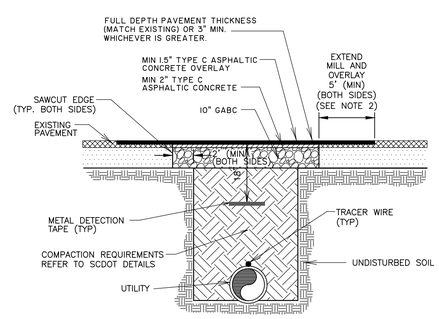


NOTES:

1. SPRAY PRE-EMERGENT HERBICIDE 6" TO 12" FROM EDGE OF NEW WEARING SURFACE ALONG THE EDGE OF THE PATH AND SPRAY ON COMPACTED SUBGRADE PRIOR TO PLACING BASE.
2. THE SUBGRADE SHALL BE COMPACTED TO 98% MAXIMUM DENSITY.
3. THE SURFACE AND BINDER COURSE SHALL BE COMPACTED TO 98% LABORATORY COMPACTED DENSITY.
4. GABC SHALL EXTEND 4" BEYOND THE EDGE OF THE ASPHALT PATH.

2 / C5.15 **ASPHALT PATH**
NOT TO SCALE



NOTE:

1. REPAIRS TO INCLUDE A MINIMUM OF 10" OF GABC. COST OF STONE SHALL BE INCLUDED IN PAVEMENT REPAIR UNIT COST.
2. MILL AND REPLACEMENT SHALL EXTEND TO THE LIMITS SHOWN IN THE PLANS OR THAT PROVIDED ABOVE. WHICHEVER IS GREATER.

3 / C4.3 **PAVEMENT REPAIR (SCDOT ROADWAYS)**
NOT TO SCALE

NO.	REVISIONS	BY	DATE

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARPA 12/5/2024 DATE OF AUTHORIZATION

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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

PATHWAY SECTION DETAILS

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/11/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	1" = 1'

C3.3

TIMBER RETAINING WALL SPECIFICATIONS

1.00 GENERAL

1.01 ALL CONSTRUCTION SHALL CONFORM TO THE INTERNATIONAL BUILDING CODE 2003 EDITION. REFERENCE TO OTHER STANDARD SPECIFICATIONS OR CODES SHALL MEAN THE LATEST STANDARD OR CODE ADOPTED AND PUBLISHED.

1.02 DRAWINGS SHOW TYPICAL AND CERTAIN SPECIFIC CONDITIONS ONLY. FOR DETAILS NOT SPECIFICALLY SHOWN PROVIDE DETAILS SIMILAR TO THOSE SHOWN.

1.03 VERIFY ALL EXISTING CONDITIONS, DIMENSIONS, AND ELEVATIONS BEFORE STARTING WORK.

1.04 NOTIFY THE ENGINEER OF CONDITIONS ENCOUNTERED IN THE FIELD CONTRADICTORY TO THOSE SHOWN ON THE CONTRACT DOCUMENTS.

1.05 THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE DESIGN, ADEQUACY, AND SAFETY OF ERECTION BRACING, SHORING, TEMPORARY SUPPORTS, ETC. THE STRUCTURAL ELEMENTS ARE NOT STABLE UNTIL THE STRUCTURE IS COMPLETE.

1.06 COORDINATION OF STRUCTURAL CONTRACT DOCUMENTS WITH CIVIL DOCUMENTS SHALL BE DONE BY THE CONTRACTOR, NOTIFY THE ENGINEER OF ANY CONFLICT AND/OR OMISSION.

2.00 TIMBER CONSTRUCTION

2.01 ALL TIMBER SHALL BE SOUTHERN PINE, DRESSED, AND GRADED IN ACCORDANCE WITH SPIB'S "'GRADING RULES"' AND WITH A MOISTURE CONTENT OF 19 PERCENT AT TIME OF DELIVERY TO THE PROJECT SITE.

2.02 UNLESS NOTED OTHERWISE, ALL LUMBER AND TIMBER SHALL BE TREATED IN ACCORDANCE WITH AWPA C2 WITH CLA AS LISTED IN AWPA P5 TO A RETENTION LEVEL OF 0.60 PCF.

2.03 ALL TIMBER HARDWARE SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153.

2.04 ALL PLATE WASHERS SHALL CONFORM WITH ASTM A36.

2.05 ALL BOLTS SHALL CONFORM WITH ASTEM A307. ALL NUTS SHALL CONFORM WITH ASTM A563. ALL WASHERS SHALL CONFORM WITH ASTM F844.

2.06 DRILL ALL HOLES STRAIGHT AND PERPENDICULAR TO THE BEARING SURFACE.

2.07 UNLESS NOTED OTHERWISE, USE ONLY FULL LENGTH TIMBERS.

2.08 COUNTERBORE HOLES FOR BOLTS FOR COUNTER SINKING BOLT HEADS AND WASHERS.

2.09 WHERE PRACTICAL, CUT TIMBER TO REQUIRED LENGTH WITH STRAIGHT CUTS AND NO SPLINTERED EDGES, AND DRILL HOLES PRIOR TO PRESERVATIVE TREATMENT TO MINIMIZE TREATING CUTS AND HOLES IN THE FIELD.

2.10 PRIOR TO ERECTION OF TIMBERS, COAT ALL CUT, BORED, DAPPED, AND DAMAGED TIMBER SURFACES IN ACCORDANCE WITH AWPA M4

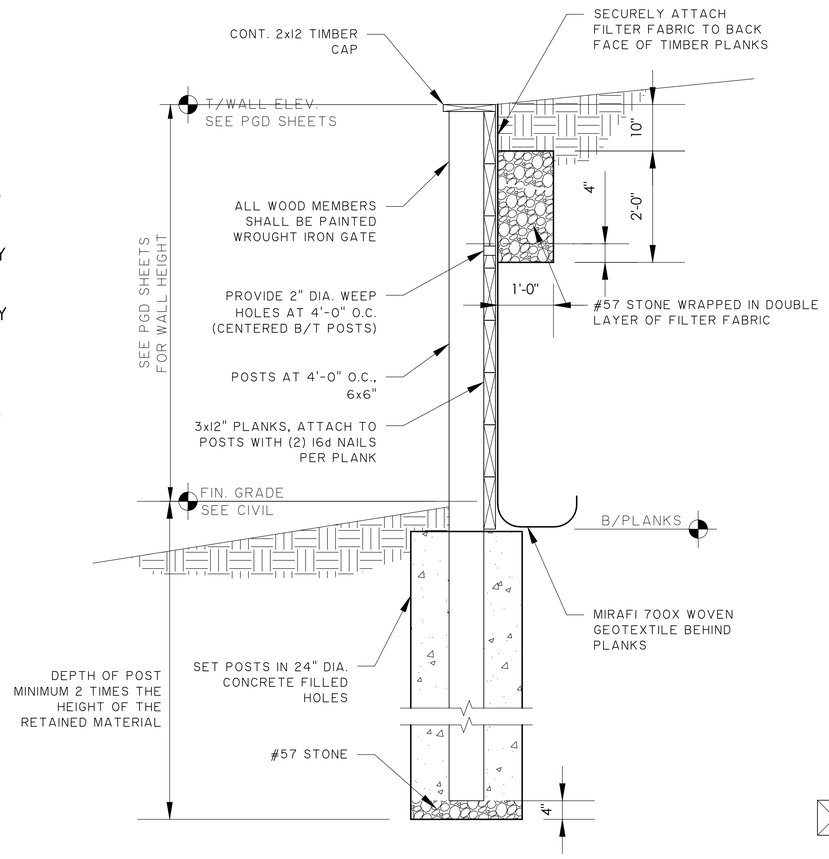
2.11 ERECT TIMBER WORK PLUMB AND LEVEL WITH TIGHT JOINTS BETWEEN ALL MEMBERS.

2.12 TIGHTEN BOLTS SUFFICIENTLY TO BRING ALL BEARING SURFACES INTO CONTACT.

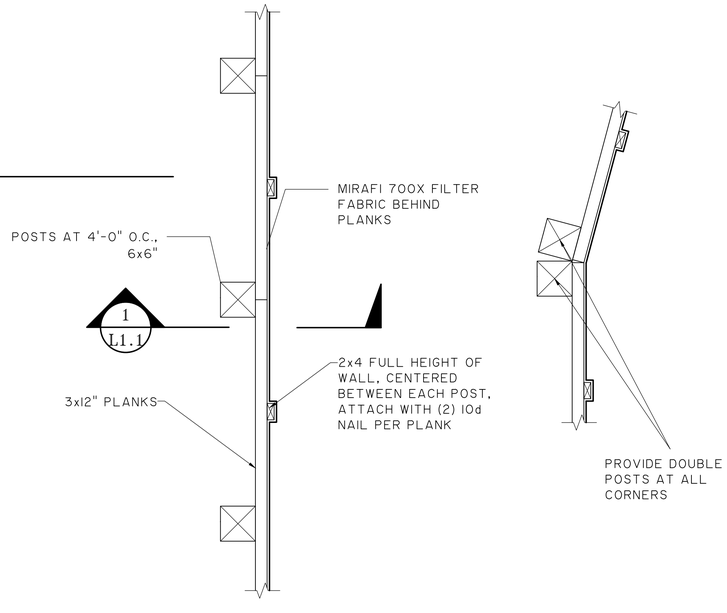
2.13 COAT END GRAIN OF ALL EXPOSED VERTICAL TIMBERS WITH PRESERVATIVE.

2.14 EXERCISE CARE WHEN HANDLING TIMBER TO AVOID SURFACE AD STRUCTURAL DAMAGE. DO NOT USE CANT HOOKS, DOGS, OR PIKE POLES FOR HANDLING TIMBER.

2.15 STORE TIMBER UNDER COVER, ABOVE GROUND AND KEEP FREE FROM DIRT, GREASE OR OTHER FOREIGN MATTER. STACK TIMBER IN A MANNER THAT WILL PREVENT LONG TIMBERS FROM SAGGING OR BECOMING CROOKED.



1 / L1.1 **SECTION THRU RETAINING WALL**
NOT TO SCALE



1 / L1.1

2 / L1.2 **PARTIAL RETAINING WALL & CORNER PLAN**
NOT TO SCALE

NO.	REVISIONS	BY	DATE
A	INITIAL SUBMITTAL COMMENTS	MCV	08/20/2025

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18837 RICHARD PETER KARNS 12/5/2025

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00265 CERTIFICATE OF AUTHORIZATION

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

WALL DETAILS

WATERWAY BLVD PATHWAY

PROJECT LOCATION:
ISLE OF PALMS, CHARLESTON COUNTY, SOUTH CAROLINA

CLIENT/OWNER:
CITY OF ISLE OF PALMS
P.O. DRAWER 508
ISLE OF PALMS, SC 29451

DATUM: HORIZ.: VERT.:

JOB NO:	27670.0010
DATE:	11/11/2024
DRAWN:	MCV
DESIGNED:	MCV
REVIEWED:	RPK
APPROVED:	RPK
SCALE:	1" = 5'

C3.4

Comprehensive Stormwater Pollution Prevention Plan (C-SWPPP) For Construction Activities:

Project/Site Name:

Waterway Blvd. Pathway

Primary Permittee:

City of Isle of Palms

Project Address/Location:
Waterway Blvd
Isle of Palms, SC 29451

Permittee/Owner Contact:
1207 Palm Blvd.
Isle of Palms, SC 29451
P: (843) 886-9912
F: (843) 886-8005
dkerr@iop.net

SWPPP Preparer:

Thomas & Hutton
Richard Karkowski, PE
682 Johnnie Dodds Blvd., Suite 100
Mount Pleasant, SC 29464
P: (843) 725-5280
F: (843) 849-0203
karkowski.r@tandh.com

Day-to-Day Operator:

TBD

C-SWPPP Preparation Date:

12/18/2024

Modification Dates:
Modification I: __ __ / __ __ / __ __ __ __
Modification II: __ __ / __ __ / __ __ __ __

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C-SWPPP is acronym for Comprehensive Storm Water Pollution Prevention Plan
****OS-SWPPP is acronym for On-Site Storm Water Pollution Prevention Plan***

Section 1 PROJECT OVERVIEW

1.1 Narrative (CGP Section 3.2.1)

Construction Activities and BMP Summary

Construction will consist of clearing, grading, erosion control, and drainage infrastructure installation of a pathway along Waterway Blvd that will serve as a flood barrier, protecting the north side of the island from tidal intrusions. Refer to the Location Map in Appendix A for more detail.

Due to the linear nature of this project, construction activities will be conducted in two erosion prevention and sediment control phases. Perimeter Control BMPs will be installed prior to the initiation of the mass clearing/grubbing and grading of the site and will be maintained during the lifespan of all construction activities, until final stabilization is reached.

Pre-Development Conditions

This project corridor consists of the existing pathway along Waterway Blvd which extends from 21st Avenue to 41st Avenue and is approximately 8,850 LF (1.68 miles). Portions of the existing pathway are below elevation 5, and as low as 4.27 and have experienced overtopping from extreme tide events on numerous occasions. The width of the sidewalk currently varies from approximately 4.5 feet wide to about 6 feet wide.

Post-Development Conditions

The proposed infrastructure for the project area includes a path that will be raised to elevation 7.0' where necessary (NAVD88) to provide protection from extreme tides and sea level rise. In select locations, protection will be provided at elevation 6.0. The path will be improved to an 8' multi-use path in place of a standard sidewalk. Additional improvements include localized drainage improvements to convey stormwater runoff captured along Waterway Blvd. under the pathway. Proposed improvements also include the installation of in-line check valves on all pipes along the corridor that discharge under the pathway to the Intracoastal Waterway. The check valves will serve to prevent tidal backflow in the drainage system and eliminate sunny day flooding as well as preserve the capacity in the drainage system.

Most of the proposed pathway improvements are located within SCDOT right-of-way along Waterway Blvd. Some portions of the proposed improvements will be located in drainage easements on Wild Dunes Golf Course Property. Additionally, protection will be constructed around the fire station on 41st Avenue.

A waiver is being requested in accordance with Section 72-302.B of the SCDHEC Standards for Stormwater Management and Sediment Reduction Regulation 72-300 thru 72-316. Per Section 72-302(B), waivers may be granted for stormwater management requirements for individual land disturbing activities by the reviewing agencies. This project qualifies for a waiver because the proposed project will return the disturbed area

to pre-development runoff conditions and pre-development land use will be unchanged at the conclusion of the project. There is no new or re-development associated with the project. The project is linear in nature and consists of implementing drainage improvements. In addition, the proposed project will have no significant adverse impact on the receiving natural waterway or downstream properties. The downstream receiving waterbody is the Intracoastal Waterway, which ultimately discharges to the Atlantic Ocean. The overall contributing drainage area to the receiving waterbodies is vastly larger than that of the project site. Therefore, the increased flows will not have a significant adverse impact on the downstream /adjacent properties.

Flooding Issues

Currently, tidal and stormwater flooding occur within the project area. Due to low elevations in the area, extreme tidal events have caused structural flooding within garages, resulting in multiple flooded cars. In addition to the tidal flooding, stormwater flooding occurs within the right-of-way due to a lack of drainage infrastructure. The proposed flood barrier and drainage improvement project will relieve flooding problems of concern for extreme tidal events and the design storm event. Refer to the Drainage Report for further supporting calculations. Additionally, the project site is located in FEMA Zone AE, elevation 11 and 12. Refer to the FEMA Map in Appendix A.

1.2 Stormwater Management and Sediment Control (CGP Section 3.2.2)

Erosion Prevention BMPs

As the existing site is cleared, grubbed, and graded to the proposed contours shown on the construction site plans, erosion prevention BMPs shall be placed throughout the construction site to aid in the prevention of sediment-laden stormwater runoff.

Each erosion prevention measure shall be selected on a site-specific basis and details have been provided on the construction site plans. The plans identify all proposed Erosion Prevention BMPs and the recommended installation, maintenance, and inspection procedures.

Examples of Erosion Prevention BMPs are, but are not limited to, surface roughening, temporary seeding, erosion control blankets, turf reinforcement mats, sodding, riprap, outlet protection, dust control, and polyacrylamide (PAM). Information on the design and proper use of Erosion Prevention BMPs can be located in the SC DHEC's BMP Handbook.

Sediment Control BMPs

Sediment Control BMPs are designed to remove some of the sediment accumulated within stormwater runoff, to the best extent practicable. These BMPs help prevent sediment impacts to adjacent properties and water bodies from stormwater discharges originating from construction sites.

Typically, these BMPs are placed near each of the site's outfalls and are installed prior to clearing and grubbing of the site (before large areas of soil are exposed). However, these BMPs can also be located throughout the construction site and, in these circumstances, are installed after mass grading has occurred. Placement, sizing and modifications of Sediment Control BMPs should be left to the SWPPP preparer and/or the Site Engineer.

Contractors must consult the SWPPP Preparer as listed at the front of this SWPPP before making any significant changes to these BMPs.

Each sediment control BMP shall be selected on a site-specific basis. Examples of Sediment Control BMPs are, but are not limited to sediment traps, sediment basins, silt fence, rock check dams, rock sediment dikes, sediment tubes, and inlet protection. Please consult SC DHEC's BMP Handbook for more information on Sediment Control BMPs.

Structural Control BMPs and Floodplain Placement

There are no Structural Control BMPs that are being proposed as part of this project.

Construction Entrances and Dust Control

All access areas into and out of the limits of disturbance, as shown on the construction site plans, are required to be equipped with a construction entrance. The use of this BMP will limit the amount of sediment being transported by construction vehicles onto existing roadways or other impervious areas. Any tracked sediment, along with any attached pollutants, deposited on impervious areas could be washed downstream during the next rain event. Each construction entrance must be installed as shown in the details section of the construction site plans.

If a new entrance or exit is required, that is not shown on the plans, install the construction entrance as noted by the construction entrance detail, mark the location on the plans and make a record of this minor modification in the SWPPP's modification log, which is located within one of the appendices of the On-site SWPPP.

Each stabilized construction entrance should be used in conjunction with Street Sweeping measures if it becomes apparent that sediment is still being tracked onto adjacent impervious areas, even with the use of the construction entrance.

During extremely dry conditions, drought, and/or excessive winds, the construction site should be treated for dust control to prevent the suspension of fine sediment particles into the air, being carried offsite, and deposited on adjacent properties or surface waters. This practice may not be directly called out for on the construction site plans. A water tanker used to spray the soil down may be an effective way to prevent excessive dust at a construction site.

Water Quality BMPs During Construction

Site-specific water quality BMPs (e.g., sediment basins, sediment traps, rock check dams, and rock sediment dikes) must be installed prior to the mass clearing, grubbing and grading of the site, and must be kept in functioning order throughout the lifespan of all construction activities. Each of these BMPs must be maintained and inspected until all areas draining to these BMPs have reached final stabilization, approved by the construction site inspector or the SWPPP Preparer, and recorded within the stabilization log located as an appendix of the On-site SWPPP.

The location, installation procedures, and maintenance procedures for each water quality BMP can be found within the approved construction site plans.

Post-Construction Water Quality

The proposed project includes improving the path to an 8' multi-use path. Water from the pathway will flow through grass areas before entering the drainage systems; this will act as the treatment for water quality.

Other Stormwater Management Procedures

Based on the nature, conditions, and/or procedures associated with this construction site, the following items must be followed and adopted by all those conducting land disturbing activities at this site:

- All construction debris must be stockpiled in designated areas, which have been provided with the proper BMPs to prevent the discharge of pollutants through stormwater runoff from building or other similar materials off-site or into surface waters.
- Any additional waste material or stockpile material (i.e., soil and mulch) must also be stored in the designated areas as shown on the Construction Site Plans or as the contractor, responsible for day-day activities at this site, deems appropriate. Silt fence or an approved equal shall surround all stockpiled materials.
- All parties conducting work at this construction site must be informed of and make note of pollutant sources, both industrial and construction, at this site, and be informed of all controls and measures the will be implemented to prevent the discharge of these pollutants in stormwater runoff.
- Any additional non-stormwater discharges, as referenced in the CGP, should be eliminated or reduced to the maximum extent feasible. All unpreventable non-stormwater discharges shall be treated through the approved stormwater management system before releasing off-site. Following is a list of allowable non-stormwater discharges:

    - Fire hydrant flushing
    - Wash water without detergents
    - Water used for dust control

- Potable water
- Building wash down water without detergents
- Uncontaminated pavement wash water
- Uncontaminated condensation from mechanical equipment
- Uncontaminated ground or spring water
- Water from foundation of footing drains
- Uncontaminated excavation dewatering
- Landscape irrigation.

1.3 Sequence of Construction

The construction sequence for this project has been provided on the construction site plans. Each item/step of that construction sequence has been listed in the sequence that they should be implemented.

For additional information or questions on the sequencing please contact the SWPPP Preparer or the Permittee referenced on the cover of this SWPPP.

1.4 Non-Numeric Effluent Limits

Stormwater Volume and Velocity Control

During the implementation of construction activities, all parties performing work at this construction site whose work may affect the implementation of the SWPPP must be informed of and directed on how to comply with this Non-Numeric Effluent Limit, which requires the management of stormwater runoff **within** the construction site and at **each outfall**. The purpose of this requirement is to control the stormwater volume and velocity at these locations to minimize erosion.

Specifically, each responsible party should be made aware of the practices that have been or should be implemented at the construction site to accomplish these particular stormwater management practices. Below is a list of practices that may be utilized within the disturbed area and at each outfall at construction sites to control stormwater volume and velocity:

Volume Control

- Limiting the amount of disturbed area and exposed soils
- Staging and/or Phasing of the Construction Sequence;
- Sediment Basins and Sediment Traps
- Diverting off-site flow around the construction site;
- Controlling the Drainage Patterns within the Construction Site;
- Temporary Stabilization of Disturbed Areas.

Velocity Control

- Surface Roughening and/or other Slope Stabilization Practices;
- Level Spreaders, Riprap Plunge Pools and/or other Velocity Dissipation BMPS located at the Construction Site's and Sediment Basin Outfalls.
- Use of Rock Checks, Sediment Tubes, Etc. in Temporary Diversions Swales and Ditches.
- Use of Erosion Control Blankets, Turf Reinforcement Mats, and other Non-Vegetative BMPs that can be used to Quickly Stabilize Disturbed Areas.

The SWPPP Preparer/Engineer should approve any modifications (Additional BMPs or Changes to Existing BMPs) to address the management of stormwater volume and velocity prior to implementation. All approved SWPPPs that were issued coverage under the CGP should include ample BMPs and other control measures to address this specific Non-Numeric Effluent Limit.

Soil Exposure, Compaction and Preservation

Throughout construction activities, **the amount of soil exposed during construction should be kept to a minimum**. This may be accomplished by minimizing the amount the disturbed area within the permitted Limits of Disturbance (shown on the approved construction site plans) to only that which is necessary to complete the proposed work. For areas that have already been disturbed and where construction activities will not begin for a period of 14 days or more, temporary stabilization techniques must be implemented.

Prior to implementation of any major grading activities, **topsoil is to be preserved** by placing it in areas designated for stockpiling until final grades are reached. Each stockpile must be equipped with proper sediment and erosion controls to preserve the topsoil and protect adjacent areas from impacts. Once final grades have been reached, the preserved topsoil should be utilized to apply to areas identified for stabilization. Topsoil contains nutrients and organisms that aid in the growth of vegetation.

The **Compaction of Soil** should also be minimized to the degree practicable during grading activities. This is especially important during the replacement of topsoil to aid in a quick establishment of vegetative cover. Compaction of soil may also reduce rainfall's ability to infiltrate into the soil, increasing the amount of stormwater runoff.

Soil Stabilization

Throughout construction activities, soil stabilization techniques are to be initiated as soon as practicable whenever any clearing, grading, excavating, or other land-disturbing activities have permanently or temporarily ceased on any portion of the construction site and will not resume for a period exceeding 14 calendar days. For areas where initiating stabilization measures is infeasible, (e.g., where snow cover, frozen ground, or drought conditions preclude stabilization), initiate vegetative or non-vegetative stabilization measures as soon as practicable.

Steep Slopes (Slopes of 30% grade or greater)

All disturbed steep slopes (30% grade, ~3H:1V, or greater), and steep slopes to be created through grading activities must be managed in a fashion that limits the potential of erosion along the slopes. All parties whose work is/was responsible for the creation/disturbance of steep slopes must comply with the following items:

- **Minimize the Disturbance** of all steep slopes, when possible.
- **Divert Concentrated or Channelized Flows** of stormwater away from and around steep slope disturbances.
- **Use Specialized BMP Controls** including temporary and permanent seeding with soil binders, erosion control blankets, surface roughening, reducing continuous slope length with terracing or diversions, gradient terraces, interceptor dikes and swales, grass-lined channels, pipe slope drains, subsurface drains, level spreaders, check dams, seep berms, and triangular silt dikes to minimize erosion.
- **Initiate Stabilization Measures** as soon as practicable on any disturbed steep slope areas where construction activities have permanently or temporarily ceased and will not resume for a period exceeding 7 calendar days.
- **A Vegetative and/or Non-Vegetative Cover** must be established within 3 working days from the time that stabilization measures were initiated.

Stabilization of steep slopes should be a priority for those performing work at the construction site. At the very least, runoff control BMPs should be implemented to transport stormwater runoff from the top of the slope to the toe of the slope. An example of this is to install diversion swales along the top of slope and direct the runoff towards pipe slopes drains to transports the runoff to the toe of the slope. All pipe slope drain outlets are to be equipped proper outlet protection.

Sediment Discharge Minimization

Permittees, Contractors, and all other parties responsible for conducting land-disturbing activities are required to install and maintain all erosion and sediment BMPs that are identified on the approved construction site plans. These BMPs have been designed and approved to address such factors as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soils particle sizes expected to be present on the construction site. **Proper installation, inspection, and maintenance will allow these BMPs to operate at maximum efficiencies in order to minimize sediment discharges to the maximum extent practical.**

Pollutant Discharge Minimization

Permittees, Contractors, and all other parties responsible for conducting land-disturbing activities are required to install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, the following items

must be implemented:

- **Minimize the discharge of pollutants from dewatering trenches and excavations** by managing runoff with the appropriate controls. Otherwise these discharges are prohibited;
- **Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters**. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
- **Minimize the exposure of building materials, building products, construction wastes, trash,** landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and
- **Minimize the discharge of pollutants from spills and leaks** and implement chemical spill and leak prevention and response procedures.

Prohibited Discharges

Permittees, Contractors, and all other responsible parties for conducting land-disturbing activities are prohibited to discharges, from the construction site, the following items:

- **Wastewater from washout of concrete**, unless managed by an appropriate control;
- **Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials**;
- **Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance**; and
- **Soaps or solvents used in vehicle and equipment washing**.

1.5 Buffer Zone Management

Due to the linear nature of this project, Buffer Zone Management does not apply.

1.6 Certification Statement

I have placed my signature and seal on the design documents submitted signifying that I accept responsibility for the design of the system. Further, I certify to the best of my knowledge and belief that the design is consistent with the requirements of Title 48, Chapter 14 of the Code of Laws of SC, 1976 as amended, pursuant to Regulation 72-300 et seq. (if applicable), and in accordance with the terms and conditions of SCR100000.

Name Richard Karkowski

Title Project Manager

Date 8/20/2025

Section 2

SITE FEATURES AND SENSITIVE AREAS

2.1 Sources of Pollution

Throughout construction activities, each permittee, contractor, and person responsible for conducting work will need to ensure that sources of pollution are managed to prevent their discharge from the construction site. Expected pollution sources during construction have been identified in Table 2.1-A, but due to the nature of construction activities, it is often tough to predict all pollution sources that may appear throughout the life of a construction project. For that reason, the following table has also been provided to help all those performing work at this construction site identify possible sources of pollution.

Stormwater runoff subjected to the identified pollution sources must be treated by the appropriate BMPs as directed by this SWPPP.

In the event that any additional sources of pollution are identified during construction, the person(s) with day-to-day operational control at the site is to add the new source(s) to Table 2.1-A and consult with the SWPPP Preparer to properly address this source and to prevent the discharge of its pollutant through stormwater runoff.

Table 2.1-A: Potential Sources of Pollution

Source	Material or Chemical	Location*	Appropriate Control Measures
Loose soil exposed/disturbed during clearing, grubbing and grading activities	Sediment	All areas within the Limits of Disturbance	As directed by the construction Plans. This includes Silt Fence, sediment tubes, sediment basins, and sediment traps.
Areas where construction equipment are cleaned, a.k.a. concrete washout	Heavy Metals & pH	Located adjacent to each construction entrance	Concrete Washout Basin as shown on sheet C-8 of the plans.
Water encountered during trenching	Nutrients & Sediment	In and around any trenching activities.	Direct water into impoundments such as basins or traps to allow for the sedimentation of the listed pollutants.
Paving Operations	Sediment & Trash	All areas to be paved.	Inlet protection.
Material Delivery and Storage Areas	Nutrients, pH, Sediment, Heavy Metals, oils & grease	All areas used as storage areas	Silt fence and/or sediment dikes
Equipment fueling and maintenance areas	Metals, hydrocarbons, oils and greases	Areas surrounding fuel tanks	Provide secondary containments, locate in upland areas. Repair leaking and broken hoses.
Paints	Metal oxides, stoddard solvent, talc, calcium-carbonate, arsenic	Throughout site, primarily in areas of building construction	Washwater should be contained and is prohibited from being discharged

*Area where material/chemical is used on site.

2.2 Surface Waters

Stormwater runoff from the proposed construction site discharges at one location to the marshes of the Intracoastal Waterway, which lies at the northern boundary of the site. Stormwater flows into the Intracoastal Waterway and eventually into the Atlantic Ocean.

The surface waters adjacent to the site are not classified as sensitive waters.

2.3 Impairments and TMDLs

Some Waters of the State (WoS) may be identified as not meeting the State's water quality standards for recreational swimming, fish consumption, aquatic life use, and/or shellfish harvesting for one or more pollutants even after controls for point and nonpoint source pollution have been put in place. These waterbodies have been classified as "impaired." Once these waterbodies have been identified they are listed on the State's 303(d) List of Impaired Waterbodies. South Carolina lists impairments as "stations" where samples were taken along a waterbody.

The most recently-approved 303(d) list can be found at the following link:

http://www.scdhec.gov/HomeAndEnvironment/Water/ImpairedWaters/

The nearest downstream Water Quality Monitoring Stations (WQMS)(s) are 19A-18, 19A-19, and 09A-01, located in the Intercoastal Waterway northeast of the Isle of Palms Connector. WQM 09A-18 and 09A-19 are both on the 303(d) list for fecal coliform. There is no established TMDL for this watershed. Refer to the 303(d) WQMS Map in Appendix A.

Site-Specific Requirements

To prevent pollution of the site's receiving waters during construction activities due to fecal coliform, porta-johns will be provided within the site and placed away from surface waters.

2.4 Critical Areas (CZC only)

There are no critical area impacts with the proposed work.

Section 3

Compliance Requirements

3.1 SWPPP Availability

A copy of the OS-SWPP (including all appendices and attachments, excluding Appendix B – Engineering Reports) shall be retained at the construction site or other location easily accessible during normal business hours. The SWPPP shall remain accessible from the date of commencement of construction activities to the date of final stabilization. If an on–site location is unavailable to store the SWPPP when no personnel are present, notice of the OS–SWPPP's location must be posted near the main entrance of the construction site.

3.2 Pre-Construction Conferences

A pre–construction conference is required as a condition of the CGP. An approved OS–SWPPP shall be available at the pre–construction conference. The pre–construction conference may be held off–site. A single pre–construction conference may be held simultaneously with all Contractors and Utility Providers/Contractors or separately with individual Contractors as required. SWPPP Modifications shall be addressed at the pre–construction conference.

All contractors, sub–contractors, annual blanket utility providers/contractors, etc. performing any construction–related (land disturbing) activity at the site must attend a pre–construction conference where the OS–SWPPP is to be thoroughly reviewed. The pre–construction conference certification form must be completed for each preconstruction conference. The pre–construction conference certification form is included in Appendix E.

3.3 Inspection Requirements

The site shall be inspected at least once every calendar week for all areas that have not reached temporary or final stabilization. Inspection frequency may be reduced in areas to at least once every month once the area has reached temporary or final stabilization.

Inspections shall be conducted by a person knowledgeable in the principles and practice of erosion and sediment controls; who possesses the skills to assess conditions at the construction site that could impact stormwater quality; and who can assess the effectiveness of any BMPs selected to control the quality of stormwater discharges from the construction site.

The person may be either the preparer of the C–SWPPP; or a person who is under the direct supervision of the preparer of the C–SWPPP and who meets the requirements in the above paragraph; or a person who has been certified through a Construction Site Inspector Certification Course approved by DHEC.

Inspections may also be conducted by a person with a registration equivalent to the registration of the preparer of the C–SWPPP and who meets the qualifications of the paragraph above or an individual who is under the direct supervision of the person with an equivalent registration and who meets the requirements above.

Site inspections shall be conducted to evaluate the overall effectiveness of the SWPPP. The main objective of the inspection is to verify that the description of potential pollutant sources is accurate, that the site maps provided in the SWPPP are accurate or have been updated to reflect current conditions, and that controls identified to reduce pollutants in storm water discharges are in place and adequately functional. The second objective of the inspection is to identify where new controls are necessary so that they may implement and incorporate the new controls into the SWPPP.

Refer to Section IV of the Stormwater Pollution Prevention Plan Notes, included as sheet EC0.0 of the Construction Site Plans, for additional inspection requirements.

All inspections shall be documented using the Construction Site Inspection Report as included in Appendix C. All completed reports are to be inserted chronologically in Appendix C. All inspections are to be noted in the Construction Inspection and Maintenance Log in Appendix C.

3.4 Maintenance Requirements

All BMPs and other protective measures identified in the SWPPP shall be maintained in effective operating condition. If site inspections identify BMPs that are not operating effectively, maintenance shall be performed within seven (7) calendar days, before the next inspection, or as reasonably possible. The maintenance shall be performed before the next storm event.

If periodic inspection or other information indicates that a BMP has been used inappropriately, or incorrectly, the BMP shall be replaced or modified as required to correct the BMP within a time frame of 48 hours of identification. If existing BMPs need to be modified or if additional BMPs are necessary to comply with the requirements of the CGP and/or SC's Water Quality Standards, implementation must be completed before the next storm event whenever practicable. If implementation before the next storm event is impracticable, document this in the SWPPP. However, alternative BMPs must be implemented as soon as reasonably possible.

Sediment from sediment traps or sedimentation basins shall be removed as indicated in the SWPPP or when the design capacity has been reduced by 50 percent, whichever occurs first. Sediment collected by silt fence, or another sediment control measure, shall be removed when the deposited sediment reaches 1/3 of the height of the aboveground portion of these BMPs, or before it reaches a lower height based on the manufacturer's specifications.

Refer to Section III of the Stormwater Pollution Prevention Plan Notes, included as sheet EC0.0 of the Construction Site Plans, for additional maintenance requirements. The Construction Site Plans are included hereby as a reference.

3.5 Record Keeping

This SWPPP shall be modified if during inspections or investigations, by the SWPPP inspector(s), or by local, state, tribal or federal officials, it is determined that the SWPPP is ineffective in either eliminating, when reasonably possible, or significantly minimizing pollutants in storm water discharges from the construction site.

Based on the results of an inspection, the SWPPP shall be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to this SWPPP must be completed within seven (7) calendar days following the inspection. Implementation of these additional or modified BMPs shall be accomplished before the next storm event whenever practicable.

This SWPPP shall be modified and submitted for review and approval by DHEC, a regulated MS4, or an entity delegated under SC Regulation 72–300 if any of the following occur:

- A significant change in design, construction, operation, or maintenance of the construction site results in discharges that will cause, have the reasonable potential to cause, or contribute to violations to SC's Water Quality Standards.
- A change in the design, construction, operation, or maintenance of the construction site calls for a revision of this SWPPP based on the list of modifications included in Section 3.1.7 of the CGP.

The SWPPP shall be modified and a record of the modification kept of each modification within this SWPPP if any of the following conditions are met:

- Addition of BMPs. Addition of BMPS shall not involve additional wetland impacts.
- BMP Relocations.
- Removal of Disturbed Areas. Removal of disturbed area shall not remove any BMPs that are required to meet SC's Water Quality or Quantity Standards and the disturbed area shall not be disturbed (i.e., cleared, grubbed or graded).
- Modifying Individual Lot Drainage. Modification of individual lot drainage shall not affect the inflow to a detention structure or analysis point.

All SWPPP modifications shall be documented using the SWPPP Modification Forms and shall be retained in Appendix E. All SWPPP modifications shall be logged on the SWPPP Modification Log in Appendix E.

3.6 Final Stabilization

A Notice of Termination (NOT) shall be submitted after one or more of the following conditions have been met:

- Final stabilization has been achieved on all portions of the construction site for which you are responsible;
- Another Operator has assumed control over all areas of the Site that have not been finally stabilized;
- Coverage under an individual or alternative general NPDES permit has been obtained; or
- For residential construction only either:
    - Final stabilization has been achieved on all portions of a residential lot(s), or
    - Temporary stabilization including perimeter controls for a residential lot(s) have been achieved prior to occupation of the home and that the homeowner has been informed, about the need for, and benefits of, final stabilization.

The primary permittee is responsible to submit the NOT. The NOT shall be submitted within 30 days of one of the above conditions being met. A copy of the current NOT form is included in Appendix G. Authorization to discharge terminates at midnight of the day the NOT is signed.

The original completed and signed NOT shall be submitted to DHEC at the following address:

SC DHEC – Bureau of Water
Coastal Stormwater Section
1362 McMillan Ave., Suite 400
Charleston, SC 29405

A copy of the submitted NOT will be kept in Appendix G.

Appendix A

Site Maps

Location Map

Soils Map

FEMA Map

303(d) Water Quality Monitoring Stations Map

Waterway Blvd. Path Project Site

0 400 800 1,600 Feet

1 inch = 800 feet

Job Number:	Produced:	Produced By:	Modified: 2/22/2024	Modified By:
File: Z:\27670\27670.001\GIS\Mxd\Location_Map.mxd				Vertical Datum:

Thomas & Hutton compiled the map information from the following sources:

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Waterway Blvd. Pathway

Charleston County, South Carolina

Location Map

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File: Z:\27670\27670.001\GIS\Mxd\Soils_Map.mxd				Vertical Datum:

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Waterway Blvd. Pathway

Charleston County, South Carolina

Soils Map

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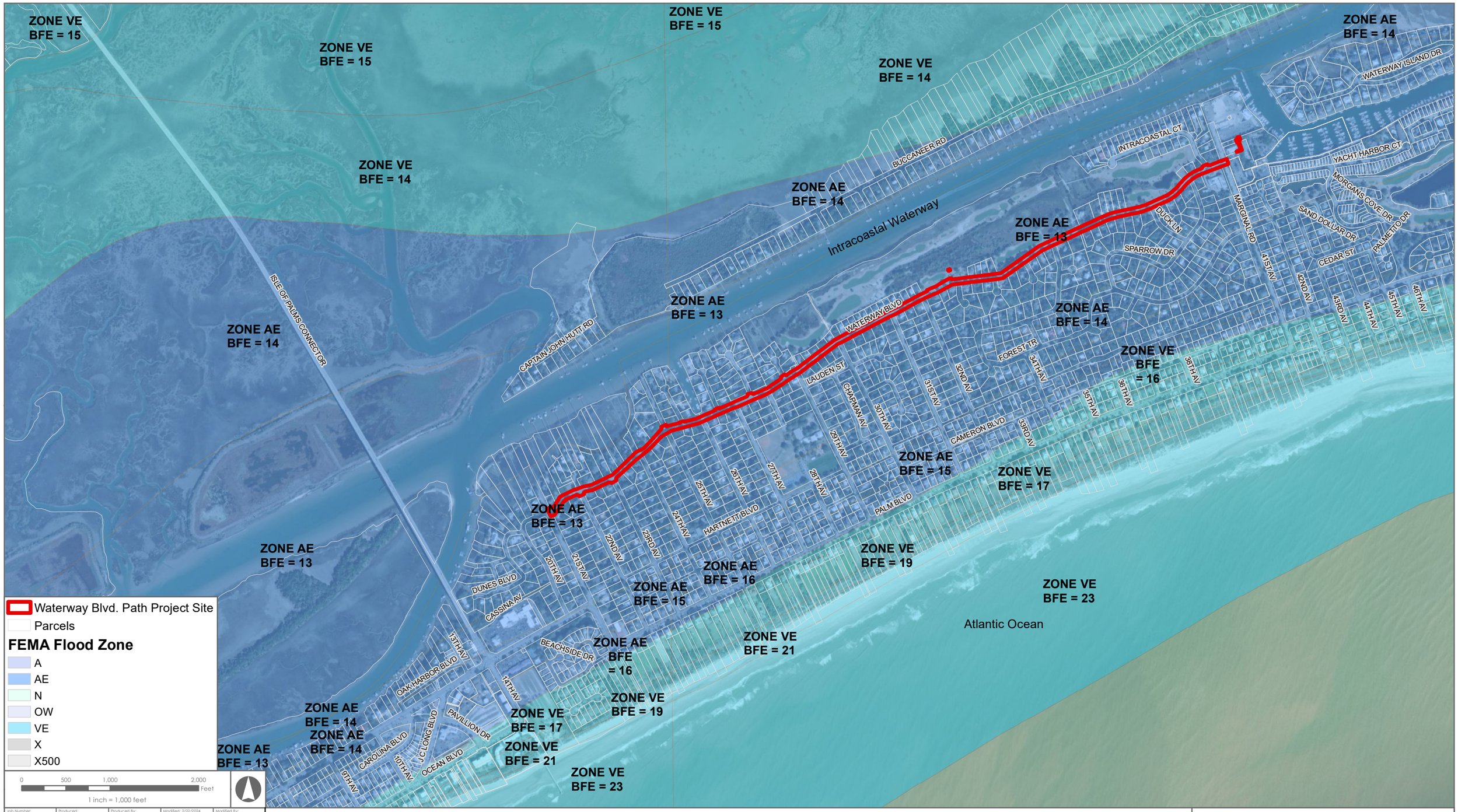

Waterway Blvd. Path Project Site

Parcels

FEMA Flood Zone

- A
- AE
- N
- OW
- VE
- X
- X500

0 500 1,000 2,000 Feet

1 inch = 1,000 feet

Job Number:	Produced:	Produced By:	Modified: 2/22/2024	Modified By:
File: Z:\27670\27670.001\GIS\Mxd\FEMA_Map.mxd				Vertical Datum:

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Waterway Blvd. Pathway

Charleston County, South Carolina

FEMA Flood Map

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Waterway Blvd. Path Project Site

Parcels

STATUS

IMPAIRED

NOT ON LIST

0 500 1,000 2,000 Feet

1 inch = 1,000 feet

Job Number:	Produced:	Produced By:	Modified: 2/22/2024	Modified By:
File: J:\27470\27670.0010\GIS\Mxd\303d_WQMS_Map.mxd				Vertical Datum:

Thomas & Hutton compiled the map information from the following sources:

Data	Source	Date

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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Waterway Blvd. Pathway

Charleston County, South Carolina

303(d) WQMS Map

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

THOMAS & HUTTON

GEOGRAPHIC INFORMATION SYSTEMS

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Appendix B

Drainage Maps

Drainage Basin Map - Refer to the Drainage Report in Appendix D.

Appendix C

Additional Approvals/Certifications

SCDHEC-OCRM Land Disturbance Approval

Coastal Zone Consistency Certification

Critical Area Impact Permit Approval

USACE Nationwide Permit Approval

MS4 Approval

Other Local Ordinance Certifications and Approvals

SC DEPARTMENT *of* ENVIRONMENTAL SERVICES

November 25, 2025

Douglas Kerr
City of Isle of Palms
1207 Palm Blvd
Isle of Palms, SC 29451

RE: Waterway Blvd Pathway, Charleston County
NPDES Coverage Number: SCR10ZJU2

Dear Douglas Kerr:

The South Carolina Department of Environmental Services (Department or SCDES) has received approval of and the Notice of Intent for the above-referenced project from **Charleston County**. Based on your submission of this documentation and in accordance with the NPDES General Permit for Stormwater Discharges from Construction Activities SCR100000 (CGP), this project has been granted coverage under the CGP on **November 25, 2025**. This project's general permit coverage number is **SCR10ZJU2**. The total disturbed area for this site is **12.6 acres**.

See attached SCDES Bureau of Coastal Management (SCDES-BCM) certification dated November 21, 2025 for additional conditions related to the Coastal Zone Consistency determination.

An as-built survey(s), signed and sealed by a S.C. Licensed Land Surveyor or Professional Engineer, should be submitted to **Charleston County** for all detention structure(s) on this site. The survey(s) should show grades, contours, and depths for all structure(s) and should include the elevations and dimensions of all outlet structures, including but not limited to pipes, orifices, risers, weirs, and emergency spillways. A statement signed by the project's S.C. Registered Engineer indicating that the structure(s) was installed and is operating as shown on approved plans and in approved calculations is required. If the elevations or dimensions of the structures listed above do not match those used in the approved plans, provide a certification statement signed by the project's S.C. Registered Engineer indicating that the structure, as built, will function as shown in approved calculations. A new analysis of the structure (routing) may be necessary.

The CGP can be downloaded at the following website: https://des.sc.gov/sites/des/files/media/document/BOW_NPDESStormwaterDischargesGP_01292021_0.pdf. You are responsible for ensuring your contractor(s) complies with the approved SWPPP and the minimum requirements of the CGP. Also, you are responsible for overall compliance with the Storm Water Management and Sediment Reduction Act of 1991 (1991 Act), SC Pollution Control Act, and the Federal Clean Water Act (CWA). Failure to comply with the approved SWPPP or applicable statutes and regulations may result in enforcement actions.

You must notify the local SCDES Bureau of Regional and Laboratory Services (BRLS) office prior to starting any land-disturbing activity. The address and telephone number are as follows:

BRLS - Charleston
1362 McMillan Avenue, Suite 300
Charleston, SC 29405
(843) 953-0150

Inspections of this site must be performed by qualified personnel as described in Section 4.2.E of the CGP.

You should be aware that this approval is only applicable for the Stormwater Pollution Prevention Plan (SWPPP) that was submitted for this project. Any additional construction or land disturbing activity beyond the scope of the approved plans is not authorized. Any future work for this project not shown on the stamped, approved plans will require that you submit another site plan for review and approval. All major modifications require review and approval by **Charleston County**; the Department must be notified in writing by **Charleston County** of the approval of major modifications if the disturbed area changes. Minor modifications to the approved SWPPP may be made by the SWPPP preparer and do not require review and approval by the Department; these changes should be signed and dated by the SWPPP preparer. If you have a question about whether a modification is major or minor, contact the Coastal Stormwater Permitting Section at (843) 953-0200.

A copy of the stamped, approved SWPPP (including a copy the CGP, contractor certifications, inspection records, rainfall data, etc), NOI, and CGP coverage letter from SCDES must be retained and available at the construction site (or accessible within 30 minutes during normal business hours) from the date of commencement of construction activities to the date of final stabilization. If an on-site location is unavailable to store the SWPPP when no personnel are present, notice of the plan's location must be posted near the main entrance at the construction site.

All contractors who will conduct land-disturbing activities at the site must complete a Contractor Certification Form. You are also responsible for listing all contractors in the SWPPP and for holding a pre-construction conference with each contractor before they can conduct land-disturbing activity at the site.

The Department may conduct periodic inspections of your site. Any violations found during these inspections may result in enforcement action.

This NPDES coverage should be terminated by the permittee when one of the conditions listed in Section 5.1 of the CGP has been met. You must submit a Notice of Termination (NOT) to cancel your NPDES coverage under the CGP. Please see section 5.1 of the CGP for additional information required to be submitted with the NOT.

You are responsible for obtaining any other federal, state, or local permit that may be required for this project. In particular, any permits through the U.S. Army Corps of Engineers for the placement of fill material

in Waters of the United States. Please note we have not sent a copy of this letter to any county or city building official. You must send a copy of this letter to these agencies, if necessary.

If material excavated during construction activities leaves the site, a mine operating permit may be needed. You are responsible for contacting the Mining and Reclamation Section to determine if a mining permit is required for the site. The Mining and Reclamation Section can be reached at (803)898-1362 or via e-mail at AskMines@des.sc.gov.

S.C. Code Ann. § 48-6-30(D)(2) provides, "Within thirty calendar days after the mailing of a decision [pursuant to S.C. Code Ann.§ 48-6-30(D)(1)], an applicant, permittee, licensee, certificate holder, or affected person desiring to contest the department decision may request a contested case hearing before the Administrative Law Court, in accordance with the Administrative Procedures Act."

If you have any questions or cannot access the referenced websites, please call me at (843) 953-8421.

Sincerely,

Haley Erwin

Digitally signed by Haley Erwin
DN: C=US, E=haley.erwin@des.sc.gov, O=SCDES, CN=Haley Erwin
Date: 2025.11.25 11:33:24-05'00'

Haley E. Erwin
Coastal Stormwater Permitting Section

ec: Tyler Davis- BRLS - Charleston
Richard Karkowski- Thomas and Hutton
Chris Wannamaker- Charleston County

NOTICE OF INTENT (NOI)
For Coverage(s) of Primary Permittees Under South Carolina NPDES General Permit For Stormwater Discharges From Construction Activities SCR100000
(Maintain As Part of On-Site SWPPP)

For Official Use Only
File Number: _____
Permit Number: SCR10_____
Submittal Package Complete: _____

Submission of this Notice of Intent constitutes notice that the Applicant identified in Section II intends to be authorized as a Primary Permittee in the state of South Carolina under NPDES General Permit SCR1000000. ***Fees required for review and NPDES coverage of each application type are as listed on page 2 of the Instructions.***

SCDES
SC DEPARTMENT of ENVIRONMENTAL SERVICES
CONSTRUCTION STORMWATER PERMITTING
APPROVED – FOR CONSTRUCTION ONLY
DES Permit # SCR10ZJU2
Date Issued 11/25/2025
Approved By Haley Erwin
Digitally signed by Haley Erwin DN: C=US, E=haley.erwin@des.sc.gov, O=SCDES, CN=Haley Erwin Date: 2025.11.25 11:33:15-05'00'

PERMITTED PLANS
09/23/2025 4:16:39 PM
NOI (O-2617) - IOP Waterway Blvd_Chs_Co_Stamped.pdf
Approved by: PWDJTP2
CHARLESTON COUNTY STORMWATER UTILITY DIVISION

Date: 01/23/2024
Project/Site Name: Waterway Blvd Pathway **County:** Charleston
(Modification or Change of Information Only) **Prior Approved NPDES Permit or File Number:** _____

Do you want this project to be considered for the Expedited Review Program (ERP)? ☐ Yes or ☑ No (See instructions)

I. Notice of Intent (NOI) Application Type(s)

A. **Project (Application/Review) Type(s)** (Select **ALL** that apply):
- ☑ New Project (Initial Notification) Ongoing Project: ☐ Permitted or ☐ Un-Permitted
- ☐ Late Notification ☐ Low Impact Development (LID) or Project Design Above Regulatory Requirements
- ☐ New Owner/Operator or Company Name Change **(see instructions, attach Form A (Transfer of Ownership))**
- ☐ Major Modification: **(see instructions, attach Form B (Major Modifications))**
- ☑ MS4 Project Review
- ☑ Ocean and Coastal Resource Management (OCRM) Review
- ☐ Change of Information/Other (Specify): _____

B. If Applicable, identify the entity designated as **MS4 Reviewer and MS4 Operator** (i.e., Lexington County, City of Greer, etc.): **MS4 Reviewer** Charleston County **MS4 Operator** City of Isle of Palms

II. Primary Permittee Information ☐ Change of Information

☐ Person or ☑ Company | If a Company, are you a ☐ Lending Institution or ☑ Government Entity?
Company EIN **(If applicable):** EIN: [redacted]

A. **Primary Permittee Name:** City of Isle of Palms
Mailing Address: 1207 Palm Blvd. City: Isle of Palms State: SC Zip: 29451
Phone: 843-886-9912 Fax: 843-886-8005 Email Address: dkerr@iop.net

B. **Contact /ODSA Name** (If different from above OR if owner is a company): Douglas Kerr
Mailing Address: 1207 Palm Blvd. City: Isle of Palms State: SC Zip: 29451
Phone: 843-886-9912 Fax: 843-886-8005 Email Address: dkerr@iop.net

C. **Property Owner Name** (If different from above): _____
Mailing Address: _____ City: _____ State: _____ Zip: _____
Phone: _____ Fax: _____ Email Address: _____

III. Comprehensive Stormwater Pollution Prevention Plan (C-SWPPP) Preparer Information ☐ Change of Information

A, **C-SWPPP Preparer Name:** Richard Karkowski
B. **Registered Professional** ☑ Engineer ☐ Landscape Architect ☐ Tier B Land Surveyor **S. C. Registration #:** 18837
C. **Company/Firm Name:** Thomas & Hutton **S. C. COA # :** C00285
Mailing Address: 682 Johnnie Dodds Blvd. City: Mount Pleasant State: SC Zip: 29466
Phone: 843-725-5280 Fax: 843-849-0203 Email Address: karkowski.r@tandh.com

IV. Project/Site Information ☐ Change of Information

A. **Type of Construction Activity(ies)** (Select **ALL** that apply):
- ☐ Commercial ☐ Industrial ☐ Institutional ☐ Mass Grading ☑ Linear ☑ Utility/Infrastructure
- ☐ Residential: Single-family ☐ Residential: Multi-family ☐ Multi-use (Commercial & Residential)
- ☐ Site Preparation (No New Impervious Area) ☐ Other (Specify) _____

B. **Site Address/Location** (street address, nearest intersection, etc.) Waterway Blvd. from 21st Ave to 41st Ave
City/Town (If in limits): City of Isle of Palms Zip Code: 29451
Latitude: 32 ° 47 ' 55 " N Longitude: - 79 ° 46 ' 27 " W (Source): ☐ GPS ☐ Web Site: Google Maps
Tax Map Number (s) (List all): 571-00-00-001, 571-08-00-019, 571-08-00-006, 571-08-00-007

C. Is this site located on **Indian Land**? ☐ Yes ☑ No

D. **Proposed Start Date**: 07/01/2025 **Proposed Completion Date**: 07/01/2026

E. **Disturbed Area** (nearest tenth of an acre): 12.6 **Total Area** (acres): 12.6

F. **Modification Only:**(nearest tenth of an acre): **Disturbed Area: Current (Approved) Area:** _____
Disturbed Area Change (Increase Only): _____ **Total Disturbed Area (After Change):** _____

G. Is this project part of a **Larger Common Plan for Development or Sale (LCP)**? ☐ Yes ☑ No
LCP/ Overall Development Name: _____ Check here if this is the **First Phase.** ☐

Previous State Permit/File Number: _____ **Previous NPDES Coverage Number**: SCR10 _____

H. Any **Flooding Problems** exist downstream of or adjacent to this site? ☑ Yes ☐ No (If yes, provide detailed description of flooding problems and applicable floodway/flood zone information in the C-SWPPP).

I. Active **S.C. DHEC Warning Notice**, **Notice to Comply or Notice of Violation** for this site or LCP? ☐ Yes ☑ No

J. List Relevant **State and Federal Environmental Permits or Approvals** applied for or obtained for this site (e.g., **RCRA, USACOE, Nationwide**, etc.). **If None, list None.**
None

K. **Any Waiver(s)/Variances/Exceptions Requested for this Project**? (If yes, identify below and include **Waiver Request and Justifications** in the C-SWPPP for each proposed request).

1. Small Construction Activity Waiver(s) From NPDES permitting **(Section 1.4 & Appendix B)**? ☐ Yes ☑ No
If yes, Identify requested waiver: ☐ Rainfall Erosivity Waiver ☐ TMDL Waiver ☐ Equivalent Analysis Waiver

2. Detention Waiver **(72-302(B)**? ☑ Yes ☐ No | 3. Other (Specify): _____

V. Waterbody Information (Attach additional sheet(s) as needed) ☐ Change of Information

A. **Receiving Waterbody(s) (RWB) Information** (List the nearest and next nearest receiving waterbodies to which the sites stormwater discharges will drain. If stormwater discharges drain to multiple waterbodies, list all such waterbodies).

1. Name of Receiving Waterbodies (RWB)	2. Distance to RWB (feet)	3. Classification of RWB
a. Nearest: Intracoastal Waterway	800	SFH
b. Next Nearest: Atlantic Ocean	20,300	SFH
c. Coastal Zone ONLY: Coastal Receiving Water (CRW): Intracoastal Waterway	800	Not Applicable
d. Other Waterbodies: _____		

B. **Waters of the U.S. / State Information** (Attach additional sheet(s) as needed)

Waters of the U.S./ State	1. On the site?	2. Delineated/ Identified?	3. Impacts?	4. Amount of impacts
a. Jurisdictional wetlands	☑ Yes ☐ No	☑ Yes ☐ No	☐ Yes ☑ No	_____ Ac
b. Non-jurisdictional wetlands	☐ Yes ☑ No	☐ Yes ☐ No	☐ Yes ☐ No	_____ Ac
c. Other Water(s): _____	☐ Yes ☑ No	☐ Yes ☐ No	☐ Yes ☐ No	_____ Ac _____ Feet
d. Coastal Zone ONLY: Direct Critical Area	☑ Yes ☐ No	☑ Yes ☐ No	☐ Yes ☑ No	_____ Ac _____ Feet

5. If yes for impacts in B.3, describe each impact and activity, and list all permits (e.g., USACOE Nationwide Permit, DHEC General Permit) and certifications that have been applied for or obtained for each impact:
_____

C. **S.C. Navigable Waters (SCNW) Information (Section 2.6.5)** The Department will address any issues related to State Navigable Waters' Program under SC Regulation 19-450 during the review of the C-SWPPP for activities that will **NOT** require a 404 permit or a 401 certification. (Attach additional sheet(s) as needed).

1. Are S. C. Navigable Waters (SCNW) on the site: ☐ Yes ☑ No
a. If **no**, do not complete this question. Proceed to Section D (Impaired Waterbodies).
b. If **yes**, provide the name of S.C. Navigable Waters (SCNW) on the site: _____

2. If **yes for C.1**, will construction activities cross over or occur in, under, or thru the SCNW? ☐ Yes ☐ No
If yes, describe SCNW activities (e.g., road crossing, sub-aqueous utility line, temporary or permanent structures, etc.) and proceed to Section C.3: _____

3. Identify permits providing coverage of SCNW activities proposed for your site. If NONE, list none.

Permits/Certifications	Permit or Certification No.	Corresponding Covered SCNW Activity(ies)
a. DHEC General/ Other DHEC Permit		
b. USACOE **404 Permit or 401 Certification**		
c. SCNW Permit If applied for or issued, identify **Date applied for or issued:** _____		☐ **All Activities** or ☐ **Some Activities (Describe):**

d. If a SCNW Permit has NOT been applied for provide an additional plan sheet that shows plan and profile views (drawn to scale) of the SCNW and associated activities. Include a description of all proposed activities on this plan.

D. **Impaired Waterbodies Information** (Attach additional sheet(s) as needed)

1. 303(d) Listed Impaired Waterbodies

a. Name of **Nearest DHEC Water Quality Monitoring Stations (WQMS)(s)** that receives stormwater from your construction site and/or thru an MS4 and the **Name of the Corresponding Waterbody?**		b. **Is this WQMS(s) listed on the most current 303(d) List? If No, proceed to Section 2 of this table. If Yes, complete items c thru f.**	c. List the pollutant(s) identified as **"CAUSES"** of the impairment	d. Will any pollutants causing the impairment be present in your site's construction stormwater discharges?	e. If **yes for d,** list the **"USE SUPPORT"** impairment(s) affected by the pollutant(s) identified in c.
Nearest DHEC WQMS(s)	**Corresponding Waterbody**				
09A-18	Intracoastal Waterway	☑ Yes ☐ No	FC	☑ Yes ☐ No	Shellfish
09A-19	Intracoastal Waterway	☑ Yes ☐ No	FC	☑ Yes ☐ No	Shellfish
09A-01	Intracoastal Waterway	☐ Yes ☑ No		☐ Yes ☐ No	

f. If **yes for d** above, **will use of the BMPs proposed for your project ensure the site's discharges will NOT contribute to or cause further WQS violations for the impairment(s) listed in c?** ☑ Yes ☐ No
(NOTE: If no for f, this site is NOT eligible for coverage under the CGP). See Instructions.

2. TMDL Impaired Waterbodies

a. Name of **Nearest DHEC Water Quality Monitoring Stations (WQMS)(s)** that receives stormwater from your construction site and/or thru an MS4?	b. Has a TMDL(s) been developed for this WQMS(s)? **If No, identify as such below and proceed to Section VI. If Yes, complete items c thru f of this table.**	c. If **yes for b,** what pollutants are listed as "CAUSES" or causing the impairment?	d. If **yes for b**, has the standard been **"ATTAINED" or " Fully Supported"** for the impairment(s)?	e. If **no for d (Not Attained),** will any pollutants causing the impairment be present in your site's construction stormwater discharges?
09A-18	☐ Yes ☑ No		☐ Yes ☐ No	☐ Yes ☐ No
09A-19	☐ Yes ☑ No		☐ Yes ☐ No	☐ Yes ☐ No
09A-01	☐ Yes ☑ No		☐ Yes ☐ No	☐ Yes ☐ No

f. If **yes for e** above, **are your discharges consistent with the assumptions and requirements of the TMDL(s)?** ☐ Yes ☐ No
(NOTE: If no for f, this site is NOT eligible for coverage under the CGP). See Instructions.

VI. Signatures and Certifications

DO **NOT** SIGN IN BLACK INK! **Read the Certifications below (in entirety). Provide date, printed name, and signatures below.** If you are a **New Owner/Operator**, as Primary Permittee you must also sign and date the applicable Comprehensive SWPPP Acceptance & Compliance Agreement below.

C-SWPPP PREPARER: "One copy of the C-SWPPP, all specifications and supporting calculations, forms, and reports are herewith submitted and made a part of this application. I have placed my signature and seal on the design documents submitted signifying that I accept responsibility for the design of the system. Further, I certify to the best of my knowledge and belief that the design is consistent with the requirements of Title 48, Chapter 14 of the Code of Laws of SC, 1976 as amended, pursuant to Regulation 72-300 et seq. (if applicable), and in accordance with the terms and conditions of SCR100000." **(This should be the person identified in Section III).**

Richard Karkowski		33521
Printed Name of C-SWPPP Preparer	**Signature of C-SWPPP Preparer**	**S. C. Registration #**

PRIMARY PERMITTEE: "I or I (on behalf of my company and its contractors and agents), as the case may be, certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I understand that DHEC enforcement actions may be taken if the terms and conditions of the C-SWPPP are not met and I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

"I or I (on behalf of my company and its contractors and agents), as the case may be, also hereby certify that all land-disturbing construction and associated activity pertaining to this site shall be accomplished pursuant to and in keeping with the terms and conditions of the approved plans and SCR100000. I also certify that a responsible person will be assigned to the project for day-to-day control. I hereby grant authorization to the to S. C. Department of Health and Environmental Control (DHEC) and/or the local implementing agency the right of access to the site at all times for the purpose of on site inspections during the course of construction and to perform maintenance inspections following the completion of the land-disturbing activity." **(See Section 122.22 of S.C. Reg. 61-9 for signatory authority information.)** Having understood the above information, I am signing this certification as Primary Permittee to the aforementioned NPDES general permit."

Douglas Kerr	City Administrator
Printed Name of Primary Permittee	**Title/Position**
Signature of Primary Permittee	**Date Signed** 9.12.25

1. 303(d) impaired waterbodies					
a.		b.	c.	d.	e.
Nearest DHEC WQMS	**Corresponding Waterbody**	**On 303(d) list?**	**Cause of impairment**	**Present in stormwater discharge?**	**If yes for d, list the use support**
MD-069	AIWW	No			
f. **If yes for d, will use of BMPs ensure the site's discharges will <u>NOT</u> contribute to further violations for the impairment listed in c? ☐ yes ☐ no**					

2. TMDL impaired waterbodies				
a.	b.	c.	d.	e.
Nearest DHEC WQMS	**Has a TMDL been developed?**	**If yes for b, list the cause of impairment**	**If yes for b, is the standard "fully supported"?**	**If no for d, will any pollutants causing the impairment be present in stormwater discharge from your site?**
MD-069	No			
f. **If yes for e, are your discharges consistent with the assumptions and requirements of the TMDLs? ☐ yes ☐ no**				

4045 Bridge View Dr.
North Charleston, SC 29405-7464
Phone: 843.202.7600
Fax 843.202.7601

CONDITIONAL PERMIT

Issue Date: NOT ISSUED

Permit # **STRM-09-25-05910**

Type: **Stormwater - Site Construction**

Work Class: **Type III - 5.0 acres or greater**

September 08, 2025

City of Isle of Palms
Attn: Douglas Kerr
P.O. Drawer 508
City of Isle of Palms, 29451

RE: 44 41ST AV – Waterway Blvd. Pathway
TMS #: 571-08-00-019

Dear: Douglas Kerr

A review of the above referenced project has been completed and determined that compliance with our Stormwater Management Ordinance and Program has been met. However, due to additional documentation and/or permits needed from other Federal, State or Local agencies, a Conditional Permit is being issued.

This permit does not constitute in any shape or form an approval to begin construction. Upon receipt of all needed documents and/or permits, a Final MS4 Permit may be issued.

If we can be of further service, please let us know.

Sincerely,

Chris Wannamaker, P.E.
Stormwater Utility Manager

cc:

SC DEPARTMENT of ENVIRONMENTAL SERVICES

Coastal Zone Consistency Determination

To:	Haley Erwin, BOW Coastal Stormwater Permitting Section
From:	Jill P. Rothenberg, BCM Coastal Zone Consistency Section
Applicant:	Douglas Kerr, City of Isle of Palms
Project Name:	Waterway Blvd Pathway
Finding:	Conditionally Consistent with the SC Coastal Zone Management Program
Site Location:	Waterway Blvd from 21st Ave to 41st Ave, Isle of Palms, Charleston County, South Carolina (TMS#: 571-00-00-001, 571-08-00-019, 571-08-00-006, 571-08-00-007)
Reference #:	HQA-6XW8-ADDYK
Date:	November 21, 2025

The staff of the Bureau of Coastal Management (BCM) reviewed the above referenced Coastal Zone Consistency project request for land disturbance associated with a new multi-use pathway and road improvements. Construction activities consist of demolition of an existing sidewalk, paving and grading for a new multi-use pathway and road improvements and a new flood barrier wall. Stormwater management will be conveyed through drainage improvements to the existing roadway drainage system. There will be no wetland impacts. The total area of disturbance will be 12.6 acres of a 12.6 acre project site.

We hereby certify that the above referenced project is **Conditionally Consistent** with the ***Guidelines for Evaluation of All Projects*** as well as the Transportation Facilities *(Roads and Highways)* and Stormwater Management *(Runoff)* policies contained in the S.C. Coastal Zone Management Program provided the following conditions are included in the permits and adhered to by the applicant.

1. In the event that any historic or cultural resources and/or archaeological materials are found during the course of work, the applicant must notify the State Historic Preservation Office and the South Carolina Institute of Archaeology and Anthropology. Historic or cultural resources consist of those sites listed in the National Register of Historic Places and those sites that are eligible for the National Register. Archaeological materials consist of any items, fifty years old or older, which were made or used by man. These items include, but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, worked wood, bone and stone, metal and glass objects, and human skeletal materials.

info@des.sc.gov | des.sc.gov | 803.898.3432

2. The project must be consistent with State Stormwater Permitting requirements during and post construction for protection of water quality.

3. All construction BMPs must be installed, inspected and maintained to hold sediment onsite and to protect any adjacent or downstream critical area, wetlands and waters through the life of the project. Upon completion of construction activities, all disturbed (including undeveloped) areas, including those impacted for access, must be immediately stabilized.

4. The project must be fully consistent with local zoning and comprehensive plans prior to work being conducted.

5. The applicant is not authorized to impact any wetlands. In the event any impacts to wetlands occur, the US Army Corps of Engineers and SCDES-BCM must be notified, and all work must cease to minimize additional impacts until the applicant receives authorization.

This determination shall serve as the SCDES BCM Coastal Zone Consistency Determination for the work described above. However, this determination ***does not*** serve as a Department permitting decision and ***does not*** alleviate the applicant's responsibility to obtain any applicable State or Federal permit(s) for the work. Local government authorizations ***may also*** be required.

info@des.sc.gov | des.sc.gov | 803.898.3432

SC DEPARTMENT of ENVIRONMENTAL SERVICES

Coastal Zone Consistency Determination

To:	Haley Erwin, BOW Coastal Stormwater Permitting Section
From:	Jill P. Rothenberg, BCM Coastal Zone Consistency Section
Applicant:	Douglas Kerr, City of Isle of Palms
Project Name:	Waterway Blvd Pathway
Finding:	Conditionally Consistent with the SC Coastal Zone Management Program
Site Location:	Waterway Blvd from 21st Ave to 41st Ave, Isle of Palms, Charleston County, South Carolina (TMS#: 571-00-00-001, 571-08-00-019, 571-08-00-006, 571-08-00-007)
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The staff of the Bureau of Coastal Management (BCM) reviewed the above referenced Coastal Zone Consistency project request for land disturbance associated with a new multi-use pathway and road improvements. Construction activities consist of demolition of an existing sidewalk, paving and grading for a new multi-use pathway and road improvements and a new flood barrier wall. Stormwater management will be conveyed through drainage improvements to the existing roadway drainage system. There will be no wetland impacts. The total area of disturbance will be 12.6 acres of a 12.6 acre project site.

We hereby certify that the above referenced project is **Conditionally Consistent** with the ***Guidelines for Evaluation of All Projects*** as well as the Transportation Facilities *(Roads and Highways)* and Stormwater Management *(Runoff)* policies contained in the S.C. Coastal Zone Management Program provided the following conditions are included in the permits and adhered to by the applicant.

1. In the event that any historic or cultural resources and/or archaeological materials are found during the course of work, the applicant must notify the State Historic Preservation Office and the South Carolina Institute of Archaeology and Anthropology. Historic or cultural resources consist of those sites listed in the National Register of Historic Places and those sites that are eligible for the National Register. Archaeological materials consist of any items, fifty years old or older, which were made or used by man. These items include, but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, worked wood, bone and stone, metal and glass objects, and human skeletal materials.

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2. The project must be consistent with State Stormwater Permitting requirements during and post construction for protection of water quality.

3. All construction BMPs must be installed, inspected and maintained to hold sediment onsite and to protect any adjacent or downstream critical area, wetlands and waters through the life of the project. Upon completion of construction activities, all disturbed (including undeveloped) areas, including those impacted for access, must be immediately stabilized.

4. The project must be fully consistent with local zoning and comprehensive plans prior to work being conducted.

5. The applicant is not authorized to impact any wetlands. In the event any impacts to wetlands occur, the US Army Corps of Engineers and SCDES-BCM must be notified, and all work must cease to minimize additional impacts until the applicant receives authorization.

This determination shall serve as the SCDES BCM Coastal Zone Consistency Determination for the work described above. However, this determination ***does not*** serve as a Department permitting decision and ***does not*** alleviate the applicant's responsibility to obtain any applicable State or Federal permit(s) for the work. Local government authorizations ***may also*** be required.

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SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
Encroachment Permit

Permit No : 300170
Permit Decision Date : 12/3/2025
Expiration Date : 12/3/2026

Type Permit :MUNICIPALITY / LOCAL FUNDED PROJECT

Location:

District	Work County	Type	Route	Aux	Begin MP	End MP
6	Charleston, SC	S-	264	None	0.307	0.014
6	Charleston, SC	S-	919	None	0.025	1.245

Contact Information

Applicant: CityofIsleofPalms Phone: (843)886-9912
Contact: Douglas Kerr
Address: 1207 Palm Blvd,
City: Isle of Palms State: SC Zip: 29451

Comments

Along Waterway Blvd from 21st Ave to 41st Avenue and behind the fire station on 41st Avenue

Special Provisions:

0004 - SCDOT SHALL BE NOTIFIED WHEN WORK DEFINED IN THE PERMIT STARTS AS WELL AS WHEN THE WORK IS COMPLETED. REFERENCE SHALL BE MADE BY PERMIT NUMBER.

0005 - APPLICANT SHALL PROVIDE TO THE DEPARTMENT THE OPPORTUNITY OF ATTENDING ANY PRE-CONSTRUCTION MEETING PRIOR TO THE BEGINNING OF WORK.

9999 - See Attached for Additional Special Provisions

Appendix D

Engineering Reports

Drainage Report

THOMAS & HUTTON

Hydraulic Design Reference:
2009
Edition of SCDOT's
"Requirements for Hydraulic
Design Studies"

HYDROLOGIC AND HYDRAULIC DESIGN REPORT

WATERWAY BLVD DRAINAGE IMPROVEMENTS

Isle of Palms, SC

Prepared for:
City of Isle of Palms

J – 27670.0010

December 18, 2024

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Drainage Map – Shady Lane and 32nd Ave. 1b
Drainage Map – Forest Trails and Sparrow Lane 1c

INTRODUCTION AND BACKGROUND

The City of Isle of Palms 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. Due to these conditions, drainage improvements have been proposed for Waterway Blvd.

Waterway Blvd is the northwesternmost road on Isle of Palms. The Isle of Palms is in southeastern Charleston County in the Lowcountry region of South Carolina. Refer to Figure 1 for a Location Map. The total project area is 12.6 acres, including the Waterway Blvd right-of-way, Wild Dunes Harbor Course, and an area within commercial lots along 41st Avenue. The proposed project includes raising the multi-use path to create a berm along Waterway Blvd. Additionally there are multiple sections of new drainage infrastructure including inlets and driveway pipes to be added along Waterway Blvd. The drainage improvements are intended to alleviate the flooding due to the conditions previously described.

HYDROLOGY

The contributing drainage areas to each structure were delineated using 2017 Charleston County LiDAR data. Refer to attached Exhibits 1a, 1b, and 1c illustrating the catchment area of each proposed structure. HEC-22 utilizes the SCS Unit Hydrograph Method to develop the runoff hydrographs for the sub-watersheds. The following hydrologic parameters have been used as input in the HEC-22 analysis:

1) The SCS Unit Hydrograph Method is used.

2) The depth of rainfall for the storm frequency was obtained from NOAA Atlas 14 and utilized as an IDF curve. The following rainfall depth was used in the HEC-22 analysis:

    a) 10-year, 5-min Design Storm = 0.799 inches
    b) 10-year, 15-min Design Storm = 1.62 inches
    c) 10-year, 30-min Design Storm = 2.34 inches
    d) 10-year, 60-min Design Storm = 3.05 inches
    e) 25-year, 5-min Design Storm = 0.9 inches
    f) 25-year, 15-min Design Storm = 1.81 inches
    g) 25-year, 30-min Design Storm = 2.69 inches
    h) 25-year, 60-min Design Storm = 3.58 inches
    i) 100-year, 5-min Design Storm = 1.07 inches
    j) 100-year, 15-min Design Storm = 2.15 inches
    k) 100-year, 30-min Design Storm = 3.29 inches
    l) 100-year, 60-min Design Storm = 4.52 inches

3) The SCS Type III Statistical Rainfall Distribution is used. This distribution pattern is determined by the Soil Conservation Service comparing regional rain gauge data.

4) Soils present on site are predominantly classified in Hydrologic Soil Group (HSG) A with a smaller area of HSG C/D, particularly in the 32nd Avenue and Shady Lane Section as shown in Figure 2, Soils Map.

5) Runoff coefficients were determined based on the land use within the catchments. For catchments primarily within residential areas, the coefficient was assumed to be 0.5. For catchments that mostly covered the roadways, 0.7 was used as the coefficient. For basins exclusively within the Harbor Course areas, a runoff coefficient of 0.10 was used.

6) Times of concentration were calculated based on the flow length, slope, and roughness factor of the land cover. Time of concentration calculations are included in Appendix A.

7) Tailwater conditions were considered for each system. With the exception of the Forest Trails drainage, the MHHW of 2.63' was used as the tailwater condition for all drainage conditions. For the Forest Trails drainage, a tailwater of 2.94' was used, utilizing the existing Forest Trails Outfall Stormwater Report. The HEC-22 reports can be found in Appendix B.

HYDRAULICS

Per the SCDOT Requirements for Hydraulic Design Studies, the system was designed for the ten-year design storm event, and the 25-year and 100-year storm events were modeled for additional information. In addition, all catch basins and inlets shall be spaced so that the spread in the street for the 10-year storm event does not exceed ½ the width of the driving lane. All proposed storm drain infrastructure was designed to meet local and state regulations.

The proposed drainage system was designed using Hydraulic Engineering Circular No. 22 (HEC-22) analysis as defined by the Federal Highway Administration and modeled within an extension of Civil3D. HEC-22 uses the rational method to calculate pipe sizes and invert elevations. HEC-22 allows a user to define a pipe network including information such as pipe sizes, inverts, lengths, and Manning's "n" values, as well as junction types and locations. The junctions are made up of curb inlets, manholes, grate inlets, or other structures where hydraulic losses can occur. The junction input data consists of structure design characteristics such open flow area, inlet dimensions, and frame elevations. Basins were delineated for each inlet and a rational C value and time of concentration assigned to each basin. Refer to Exhibits 1a, 1b, and 1c for sub-catchment drainage areas.

Due to the mostly flat topography of the site and drainage area, there is limited allowable slope for the proposed drainage pipes. By using a minimum slope of 0.40%, the pipe runs would be unfeasibly deep and cost prohibitive. Additionally, two of the proposed alignments are tying to existing drainage, which limits the inverts and slopes. While the proposed system does not meet the required Charleston County slope or velocity, the existing drainage is inadequate and undersized in multiple places along Waterway Blvd, and the proposed drainage will still offer significant improvements for the area.

Frame elevations for inlets were set to match the existing surface and pipes were sized through an iterative process to establish the desired hydraulic grade line for the design storm event. When staging exceeded the frame elevation, the inlet and subsequent pipe were reevaluated to minimize staging above the frame elevation for the design storm. Refer to the attachments for a plan view of the pipe network and input/output reports from the HEC-22 analysis.

DESIGN

The proposed required drainage improvements along Waterway Blvd. will include multiple networks consisting of 1,735 LF of 18" Class III Reinforce Concrete Pipes (RCP) and 29 new structures. Drainage improvements on Waterway Blvd are located at 22nd Avenue, 23rd Avenue, 25th Avenue, 32nd Avenue and Shady Lane, Forest Trail, and Sparrow Drive.

The proposed drainage has been designed to carry the 10-year design storm and can also handle the 25-year design storm without overtopping. For a 100-year design storm, there will be overtopping throughout the majority of the proposed system, but the proposed drainage will still offer an improvement from existing conditions, as there is currently no drainage in many of these drainage areas.

WAIVER

Per Section 72-302.B of the SCDHEC Standards for Stormwater Management and Sediment Reduction Regulation 72-300 through 72-316, waivers may be granted for stormwater management requirements for individual land disturbing activities by the reviewing agencies. This project qualifies for a waiver because the proposed project will return the disturbed area to pre-development runoff conditions and pre-development land use will be unchanged at the conclusion of the project. There is no new or re-development associated with the project. The project is linear in nature and consists of implementing drainage improvements. In addition, the proposed project will have no significant adverse impact on the receiving natural waterway or downstream properties. The downstream receiving waterbody is the Intracoastal Waterway, which ultimately discharges to the Atlantic Ocean. The overall contributing drainage area to the receiving waterbodies is vastly larger than that of the project site. Therefore, any increase in flow associated with the proposed drainage improvements will not have any adverse impact on downstream properties or the receiving waterbodies.

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HYDROLOGIC AND HYDRAULIC DESIGN REPORT

WATERWAY BLVD. DRAINAGE IMPROVEMENTS

FIGURES

J – 27670.0010

February 2025

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Waterway Blvd. Path Project Site

0 400 800 1,600 Feet

1 inch = 800 feet

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Waterway Blvd. Pathway

Charleston County, South Carolina

Location Map

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Waterway Blvd. Pathway

Charleston County, South Carolina

Soils Map

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Waterway Blvd. Pathway

Charleston County, South Carolina

Land Use Map

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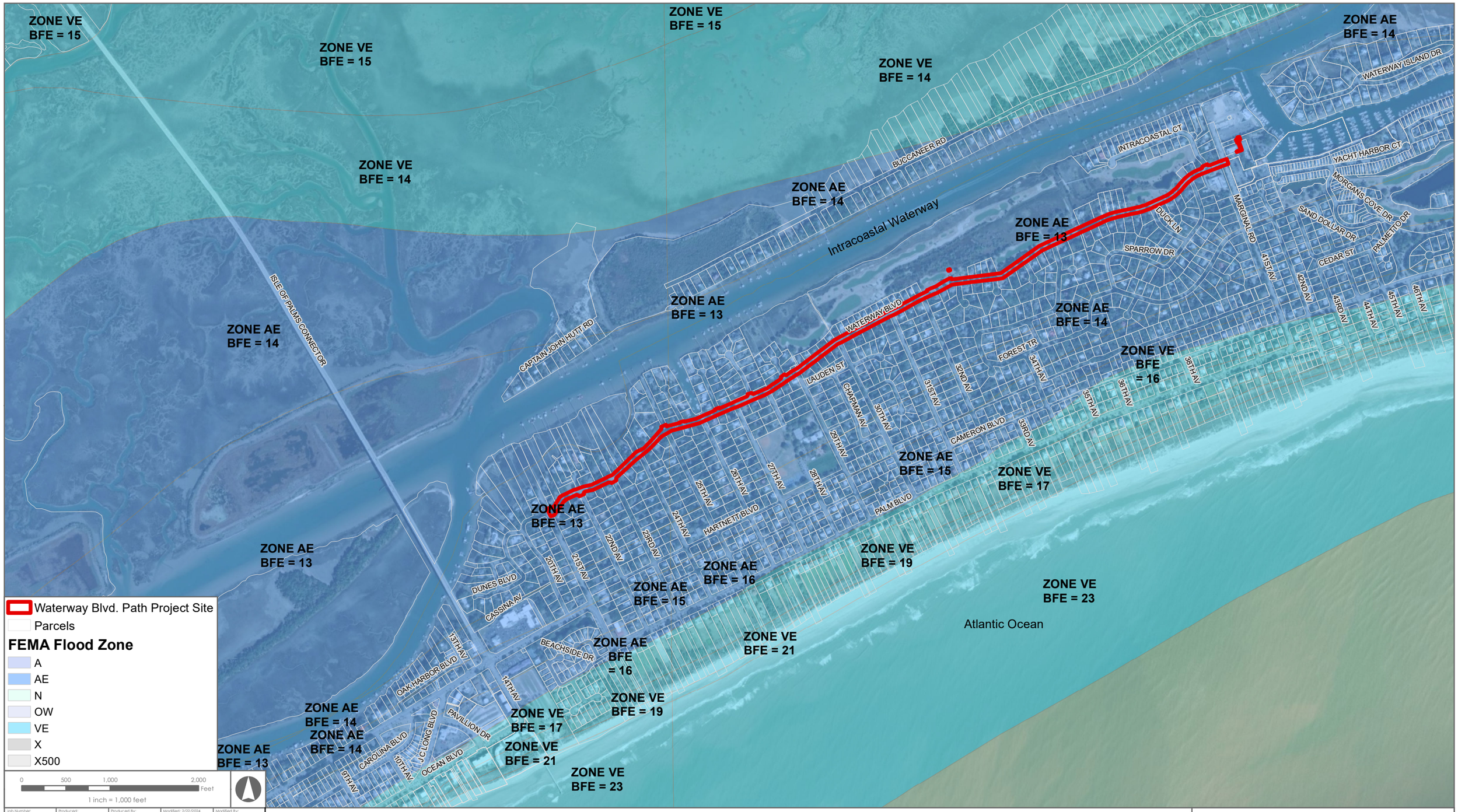

Waterway Blvd. Path Project Site

Parcels

FEMA Flood Zone

- A
- AE
- N
- OW
- VE
- X
- X500

0 500 1,000 2,000 Feet

1 inch = 1,000 feet

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Waterway Blvd. Pathway

Charleston County, South Carolina

FEMA Flood Map

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Waterway Blvd. Path Project Site

Parcels

STATUS

IMPAIRED

NOT ON LIST

0 500 1,000 2,000 Feet

1 inch = 1,000 feet

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Waterway Blvd. Pathway

Charleston County, South Carolina

303(d) WQMS Map

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HYDROLOGIC AND HYDRAULIC DESIGN REPORT

WATERWAY BLVD. DRAINAGE IMPROVEMENTS

APPENDIX A

TIME OF CONCENTRATION CALCULATIONS

J – 27670.0010

February 2025

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TIME OF CONCENTRATION CALCULATIONS

THOMAS & HUTTON

PROJECT: IOP Waterway Blvd Pathway
LOCATION: Charleston, SC

Job: 27670.0010
Date: 1/30/25
By: MCV

		Overland Sheet Flow t = (0.007(nl)^0.8)/((P2^0.5)*(S^0.4)) 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)						Shallow Concentrated Flow t=l/60v t = Travel time for Shallow Concentrated Flow (min) l = Length of flow (ft) v=Velocity (ft/s)					Channel Flow t=l/60v t=Travel time for Channel Flow (min) l=Length of flow (ft) S=Average watercourse slope (ft/ft) n = Manning's Coefficient for Channel Flow A=Cross-Sectional Area (ft2) P=Wetted Perimeter (ft) R=Hydraulic Radius (ft) v=Velocity (ft/s)- From TR-55									Pipe Flow t=l/60v l = Length of flow (ft) v=Velocity (ft/s)			
	Basin	L (ft)	S (ft/ft)	P2 (in)	Cover	n	T_1 (min)	L (ft)	S (ft/ft)	Paved ?	v (ft/s)	T_2 (min)	L (ft)	S (ft/ft)	A (sf)	P (ft)	Channel Condition	n	R (ft)	v (ft/s)	T_3 (min)	L (ft)	v (ft/s)	T_4 (min)	Tc (min)
Existing	E-001	42	0.0733	4.6	Pvmt. & Grass Combo (75/25)	0.046	0.9	0	0.0066	No	1.31	0.0	0	0.0015	120.00	41.53	Hwy. r/w grass to 2-inches	0.050	2.89	2.34	0.0	0	2.00	0.0	1
	E-002	47	0.0085	4.6	Pvmt. & Grass Combo (50/50)	0.100	4.5	0	0.0066	No	1.31	0.0	0	0.0014	440.00	74.00	Not maintained, clean btm, brush on sides	0.075	5.95	2.43	0.0	20	2.00	0.2	5
	E-003	30	0.0227	4.6	Grass: Short	0.150	3.0	0	0.0249	Yes	3.21	0.0	13	0.0046	1.65	132.70	Earth, fairly uniform, some weeds	0.028	0.01	0.19	1.1	0	2.00	0.0	4
	E-004	15	0.0420	4.6	Grass: Short	0.150	1.3	25	0.0040	No	1.02	0.4	0	0.0008	4.00	6.47	Not maintained, dense weeds high as flow depth	0.100	0.62	0.31	0.0	0	2.00	0.0	2
	E-005	43	0.0237	4.6	Pvmt. & Grass Combo (50/50)	0.100	2.8	270	0.0250	Yes	3.21	1.4	0	0.0008	4.00	6.47	Not maintained, dense weeds high as flow depth	0.100	0.62	0.31	0.0	0	2.00	0.0	4
	E-006	22	0.0291	4.6	Woods: Light Underbrush	0.400	4.6	0	0.0233	Yes	3.10	0.0	0	0.0008	4.00	6.47	Not maintained, dense weeds high as flow depth	0.100	0.62	0.31	0.0	17	2.00	0.1	5
	E-007	79	0.0649	4.6	Grass: Dense	0.240	6.2	0	0.0066	No	1.31	0.0	193	0.0008	1,040.00	50.66	Natural stream, some grass/weeds	0.030	20.53	10.51	0.3	0	2.00	0.0	6
Proposed	B-001	100	0.0597	4.6	Pvmt. & Grass Combo (50/50)	0.100	3.8	196	0.0067	Yes	1.66	2.0	0	0.0020	11.00	16.20	Hwy. r/w grass to 2-inches	0.050	0.68	1.03	0.0	50	2.00	0.4	6
	B-002	46	0.0270	4.6	Pvmt. & Grass Combo (50/50)	0.100	2.8	69	0.0149	No	1.97	0.6	0	0.0027	44.00	20.13	Earth, fairly uniform, dense weeds	0.035	2.19	3.72	0.0	10	2.00	0.1	3
	B-003	68	0.0174	4.6	Pvmt. & Grass Combo (50/50)	0.100	4.6	18	0.0161	Yes	2.58	0.1	0	0.0002	16.50	16.44	Earth, fairly uniform, dense weeds	0.035	1.00	0.60	0.0	32	2.00	0.3	5
	B-004	77	0.0070	4.6	Grass: Short	0.150	10.1	0	0.0012	Yes	0.70	0.0	0	0.0040	61.20	34.72	Earth, fairly uniform, dense weeds	0.035	1.76	3.92	0.0	38	2.00	0.3	10
	B-005	50	0.0036	4.6	Pvmt. & Grass Combo (50/50)	0.100	6.7	0	0.0129	Yes	2.30	0.0	0	0.0033	45.00	22.00	Earth, fairly uniform, dense weeds	0.035	2.05	3.93	0.0	47	2.00	0.4	7
	B-006	40	0.0111	4.6	Grass: Short	0.150	5.0	27	0.0104	No	1.65	0.3	0	0.0008	7.65	12.23	Asphalt, Smooth	0.013	0.63	2.36	0.0	0	2.00	0.0	5
	B-007	10	0.1592	4.6	Grass: Short	0.150	0.6	190	0.0098	No	1.60	2.0	0	0.0107	75.00	28.16	Not maintained, dense weeds high as flow depth	0.100	2.66	2.95	0.0	0	2.00	0.0	3
	B-008	68	0.0385	4.6	Pvmt. & Grass Combo (50/50)	0.100	3.3	139	0.0016	No	0.65	3.6	0	0.0071	14.40	22.14	Hwy. r/w grass to 2-inches	0.050	0.65	1.88	0.0	0	2.00	0.0	7
	B-009	100	0.0118	4.6	Pvmt. & Grass Combo (50/50)	0.100	7.3	122	0.0002	Yes	0.26	7.9	0	0.0008	4.00	6.47	Not maintained, dense weeds high as flow depth	0.100	0.62	0.31	0.0	0	2.00	0.0	15
	B-010	48	0.0200	4.6	Grass: Short	0.150	4.5	82	0.0059	No	1.24	1.1	0	0.0060	24.00	14.00	Earth, fairly uniform, dense weeds	0.035	1.71	4.71	0.0	0	2.00	0.0	6
	B-011	90	0.0264	4.6	Grass: Short	0.150	6.7	0	0.0003	Yes	0.35	0.0	0	0.0150	61.00	38.60	Earth, fairly uniform, dense weeds	0.035	1.58	7.06	0.0	0	2.00	0.0	7
	B-012	17	0.0480	4.6	Grass: Short	0.150	1.4	0	0.0055	Yes	1.51	0.0	0	0.0037	10.00	17.11	Earth, fairly uniform, dense weeds	0.035	0.58	1.81	0.0	0	2.00	0.0	1
	B-013	66	0.0350	4.6	Pvmt. & Grass Combo (50/50)	0.100	3.4	0	0.0035	No	0.95	0.0	0	0.0053	84.00	26.00	Earth, fairly uniform, dense weeds	0.035	3.23	6.76	0.0	0	2.00	0.0	3
	B-014	44	0.0045	4.6	Smooth/Paved Surfaces	0.011	1.0	51	0.0086	No	1.50	0.6	0	0.0033	45.00	22.00	Earth, fairly uniform, dense weeds	0.035	2.05	3.93	0.0	0	2.00	0.0	2
	B-015	100	0.0228	4.6	Grass: Short	0.150	7.8	65	0.0080	No	1.44	0.8	0	0.0008	4.00	6.47	Not maintained, dense weeds high as flow depth	0.100	0.62	0.31	0.0	0	2.00	0.0	9
	B-016	100	0.0228	4.6	Pvmt. & Grass Combo (50/50)	0.100	5.6	100	0.0059	No	1.24	1.3	0	0.0107	75.00	28.16	Earth, fairly uniform, dense weeds	0.035	2.66	8.44	0.0	0	2.00	0.0	7
	B-017	100	0.0240	4.6	Pvmt. & Grass Combo (50/50)	0.100	5.5	106	0.0064	No	1.29	1.4	0	0.0008	4.00	6.47	Not maintained, dense weeds high as flow depth	0.100	0.62	0.31	0.0	0	2.00	0.0	7
	B-018	56	0.1009	4.6	Grass: Short	0.150	2.7	0	0.0096	Yes	1.99	0.0	0	0.0018	25.00	24.35	Hwy. r/w grass to 2-inches	0.050	1.03	1.28	0.0	0	2.00	0.0	3
	B-019	81	0.0441	4.6	Grass: Short	0.150	5.0	100	0.0032	No	0.91	1.8	0	0.0008	4.00	6.47	Not maintained, dense weeds high as flow depth	0.100	0.62	0.31	0.0	0	2.00	0.0	7
	B-020a	15	0.0947	4.6	Grass: Short	0.150	1.0	37	0.0003	Yes	0.33	1.8	0	0.0008	4.00	6.47	Not maintained, dense weeds high as flow depth	0.100	0.62	0.31	0.0	0	2.00	0.0	3
	B-020	76	0.0646	4.6	Pvmt. & Grass Combo (50/50)	0.100	3.0	46	0.0015	Yes	0.79	1.0	0	0.0008	12.60	17.22	Hwy. r/w grass to 2-inches	0.050	0.73	0.68	0.0	0	2.00	0.0	4
	B-021	50	0.1068	4.6	Grass: Short	0.150	2.4	209	0.0046	Yes	1.38	2.5	0	0.0008	12.60	17.22	Hwy. r/w grass to 2-inches	0.050	0.73	0.68	0.0	0	2.00	0.0	5
	B-022	100	0.0233	4.6	Pvmt. & Grass Combo (50/50)	0.100	5.6	56	0.0086	No	1.49	0.6	0	0.0008	4.00	6.47	Not maintained, dense weeds high as flow depth	0.100	0.62	0.31	0.0	0	2.00	0.0	6
	B-023	93	0.0186	4.6	Pvmt. & Grass Combo (50/50)	0.100	5.7	10	0.0020	No	0.72	0.2	0	0.0008	880.00	240.80	Not maintained, dense weeds high as flow depth	0.100	3.65	1.00	0.0	0	2.00	0.0	6
	B-024	100	0.0067	4.6	Grass: Short	0.150	12.7	105	0.0011	Yes	0.67	2.6	0	0.0008	4.00	6.47	Not maintained, dense weeds high as flow depth	0.100	0.62	0.31	0.0	0	2.00	0.0	15
	B-024a	15	0.0640	4.6	Pvmt. & Grass Combo (50/50)	0.100	0.8	0	0.0011	Yes	0.67	0.0	0	0.0008	4.00	6.47	Not maintained, dense weeds high as flow depth	0.100	0.62	0.31	0.0	0	2.00	0.0	1
	B-025	100	0.0101	4.6	Grass: Short	0.150	10.7	123	0.0015	Yes	0.79	2.6	0	0.0008	180.00	61.00	Not maintained, dense weeds high as flow depth	0.100	2.95	0.86	0.0	0	2.00	0.0	13
	B-026	100	0.0101	4.6	Grass: Short	0.150	10.7	103	0.0068	Yes	1.68	1.0	0	0.0008	4.00	6.47	Not maintained, dense weeds high as flow depth	0.100	0.62	0.31	0.0	0	2.00	0.0	12

THOMAS & HUTTON

HYDROLOGIC AND HYDRAULIC DESIGN REPORT

PALM BLVD. DRAINAGE IMPROVEMENTS

APPENDIX B

HEC-22 REPORTS

J – 27670.0010

February 2025

thomasandhutton.com

Struct. ID	*Q* (cfs)	*EGLo* (ft)	*HGLo* (ft)	Total Pipe Loss (ft)	*EGLi* (ft)	*HGLi* (ft)	*Ea* (ft)	*EGLa* (ft)	Surface Elev. (ft)
1 (52)		2.63	2.63						1.88
1 (51)	2.0	2.65	2.63	0.10	2.75	2.73	1.9	2.76	3.15
1 (23)	1.2	2.76	2.75	0.02	2.78	2.78	1.4	2.78	5.39
1 (22)	0.9	2.79	2.78	0.13	2.92	2.83	1.4	2.95	3.54
1 (49)	0.3	2.95	2.95		5.53	5.16	0.5	5.53	6.24
1 (48)	0.1	5.53	5.53		5.85	5.64	0.3	5.85	6.75
1 (50)	0.1	5.53	5.53		5.82	5.63	0.3	5.82	6.75
1 (20)		2.63	2.63						4.21
1 (18)	0.3	2.67	2.67	0.60	3.27	3.23	0.7	3.30	6.49
1 (16)	0.3	3.30	3.30	0.15	3.45	3.40	0.7	3.48	6.34

HEC-22
Storm Drain Computations
Existing Drainage - 10 yr

Structure ID		Length (ft)	Drainage Area (ac)	Runoff Coeff "C"	Tc (min)	Rain "I" (in/hr)	Runoff "Q" (cfs)	Total Q (cfs)	Pipe Dia. (in)	Full Q (cfs)	Velocity Full (ft/s)	Velocity Design (ft/s)	Invert Elevation		Slope
From	To												U/S	D/S	
1 (51)	1 (52)	278	0.20	0.50	7	9.05	2.0	2.0	18	5.7	3.24	2.96	0.90	0.08	0.30%
1 (23)	1 (51)	174	0.04	0.70	5	9.41	1.2	1.2	18	5.7	3.24	2.54	1.42	0.90	0.30%
1 (22)	1 (23)	44	0.09	0.70	5	9.51	0.9	0.9	18	5.7	3.22	2.35	1.55	1.42	0.29%
1 (49)	1 (22)	51	0.01	0.70	5	9.56	0.3	0.3	15	15.7	12.78	4.84	5.05	2.08	5.89%
1 (48)	1 (49)	10	0.02	0.70	5	9.56	0.1	0.1	12	8.2	10.40	3.64	5.56	5.05	5.24%
1 (50)	1 (49)	9	0.01	0.70	5	9.56	0.1	0.1	15	15.3	12.46	3.47	5.56	5.05	5.59%
1 (18)	1 (20)	251	0.01	0.55	5	9.56	0.3	0.3	18	5.1	2.91	1.62	2.60	2.00	0.24%
1 (16)	1 (18)	40	0.05	0.55	5	9.56	0.3	0.3	18	6.4	3.63	1.80	2.75	2.60	0.37%

HEC-22
Inlet Capacity Results
Existing Drainage - 10 yr

Structure	Q=CIA/Kc (cfs)	Longitudinal Slope SL (ft/ft)	Cross Slope *Sx* (ft/ft)	Cross Slope *Sw* (ft/ft)	Total Gutter Flow (cfs)	Depth *d* (ft)	Gutter Width (ft)	Inlet Type	Grate Length (in)	Grate Width (in)	Curb Opening Length (in)	Curb Opening Height (in)	Intercept Flow Q*i* (cfs)
1 (22)	0.6	-1.00	0.02	0.05	0.6	0.1	2.0	Grate inlet	36.0	24.0			0.6
1 (23)	0.3	-1.00	0.02	0.05	0.3	-0.0	2.0	Grate inlet	36.0	24.0			0.3
1 (48)	0.1	-1.00	0.02	0.05	0.1	-0.1	2.0	Grate inlet	24.0	24.0			0.1
1 (49)	0.1	-1.00	0.02	0.05	0.1	-0.1	2.0	Grate inlet	24.0	24.0			0.1
1 (50)	0.1	-1.00	0.02	0.05	0.1	-0.1	2.0	Grate inlet	24.0	24.0			0.1
1 (51)	0.9	-1.00	0.02	0.05	0.9	0.1	2.0	Grate inlet	24.0	24.0			0.9
1 (16)	0.3	-1.00	0.02	0.05	0.3	-0.0	2.0	Grate inlet	36.0	24.0			0.3
1 (18)	0.0	-1.00	0.02	0.05	0.0	-0.1	2.0	Grate inlet	36.0	24.0			0.0

HEC-22

Energy Grade Line Computations

Existing Drainage - 25 yr

Struct. ID	*Q* (cfs)	*EGLo* (ft)	*HGLo* (ft)	Total Pipe Loss (ft)	*EGLi* (ft)	*HGLi* (ft)	*Ea* (ft)	*EGLa* (ft)	Surface Elev. (ft)
1 (52)		2.63	2.63						1.88
1 (51)	2.3	2.66	2.63	0.13	2.79	2.76	1.9	2.80	6.71
1 (23)	1.3	2.80	2.79	0.03	2.83	2.82	1.4	2.83	5.39
1 (22)	1.0	2.84	2.83	0.13	2.97	2.87	1.5	3.02	5.50
1 (49)	0.3	3.02	3.02		5.56	5.17	0.5	5.56	6.24
1 (48)	0.1	5.56	5.56		5.87	5.65	0.3	5.87	6.75
1 (50)	0.1	5.56	5.56		5.84	5.63	0.3	5.84	7.02
1 (20)		2.63	2.63						4.21
1 (18)	0.4	2.68	2.67	0.60	3.28	3.23	0.7	3.31	6.49
1 (16)	0.3	3.31	3.31	0.15	3.46	3.41	0.7	3.49	6.34

HEC-22
Storm Drain Computations
Existing Drainage - 25 yr

Structure ID		Length (ft)	Drainage Area (ac)	Runoff Coeff "C"	Tc (min)	Rain "I" (in/hr)	Runoff "Q" (cfs)	Total Q (cfs)	Pipe Dia. (in)	Full Q (cfs)	Velocity Full (ft/s)	Velocity Design (ft/s)	Invert Elevation		Slope
From	To												U/S	D/S	
1 (51)	1 (52)	278	0.20	0.50	7	10.24	2.3	2.3	18	5.7	3.24	3.06	0.90	0.08	0.30%
1 (23)	1 (51)	174	0.04	0.70	5	10.63	1.3	1.3	18	5.7	3.24	2.63	1.42	0.90	0.30%
1 (22)	1 (23)	44	0.09	0.70	5	10.74	1.0	1.0	18	5.7	3.22	2.44	1.55	1.42	0.29%
1 (49)	1 (22)	51	0.01	0.70	5	10.80	0.3	0.3	15	15.7	12.78	5.02	5.05	2.08	5.89%
1 (48)	1 (49)	10	0.02	0.70	5	10.80	0.1	0.1	12	8.2	10.40	3.78	5.56	5.05	5.24%
1 (50)	1 (49)	9	0.01	0.70	5	10.80	0.1	0.1	15	15.3	12.46	3.60	5.56	5.05	5.59%
1 (18)	1 (20)	251	0.01	0.55	5	10.80	0.4	0.4	18	5.1	2.91	1.68	2.60	2.00	0.24%
1 (16)	1 (18)	40	0.05	0.55	5	10.80	0.3	0.3	18	6.4	3.63	1.87	2.75	2.60	0.37%

HEC-22
Inlet Capacity Results
Existing Drainage - 25 yr

Structure	Q=CIA/Kc (cfs)	Known Q (cfs)	Longitudinal Slope SL (ft/ft)	Cross Slope *Sx* (ft/ft)	Cross Slope *Sw* (ft/ft)	Total Gutter Flow (cfs)	Depth *d* (ft)	Gutter Width (ft)	Inlet Type	Grate Length (in)	Grate Width (in)	Curb Opening Length (in)	Curb Opening Height (in)	Intercept Flow Q*i* (cfs)
1 (22)	0.7		-1.00	0.02	0.05	0.7	0.1	2.0	Grate inlet	36.0	24.0			0.7
1 (23)	0.3		-1.00	0.02	0.05	0.3		2.0	Grate inlet	36.0	24.0			0.3
1 (48)	0.1		-1.00	0.02	0.05	0.1	-0.1	2.0	Grate inlet	24.0	24.0			0.1
1 (49)	0.1		-1.00	0.02	0.05	0.1	-0.1	2.0	Grate inlet	24.0	24.0			0.1
1 (50)	0.1		-1.00	0.02	0.05	0.1	-0.1	2.0	Grate inlet	24.0	24.0			0.1
1 (51)	1.1		-1.00	0.02	0.05	1.1	0.1	2.0	Grate inlet	24.0	24.0			1.1
1 (16)	0.3		-1.00	0.02	0.05	0.3		2.0	Grate inlet	36.0	24.0			0.3
1 (18)	0.1		-1.00	0.02	0.05	0.1	-0.1	2.0	Grate inlet	36.0	24.0			0.1

Struct. ID	*Q* (cfs)	*EGLo* (ft)	*HGLo* (ft)	Total Pipe Loss (ft)	*EGLi* (ft)	*HGLi* (ft)	*Ea* (ft)	*EGLa* (ft)	Surface Elev. (ft)
1 (52)		2.63	2.63						1.88
1 (51)	2.7	2.67	2.63	0.19	2.85	2.82	2.0	2.87	6.71
1 (23)	1.6	2.87	2.86	0.04	2.91	2.90	1.5	2.92	5.39
1 (22)	1.2	2.92	2.91	0.13	3.05	2.95	1.6	3.11	5.50
1 (49)	0.4	3.11	3.11		5.61	5.18	0.6	5.61	6.24
1 (48)	0.1	5.62	5.61		5.90	5.65	0.3	5.90	6.75
1 (50)	0.1	5.61	5.61		5.86	5.64	0.3	5.86	7.02
1 (20)		2.63	2.63						4.21
1 (18)	0.4	2.68	2.68	0.60	3.28	3.24	0.7	3.32	6.49
1 (16)	0.4	3.32	3.32	0.15	3.47	3.41	0.8	3.50	6.34

Structure ID		Length (ft)	Drainage Area (ac)	Runoff Coeff "C"	Tc (min)	Rain "I" (in/hr)	Runoff "Q" (cfs)	Total Q (cfs)	Pipe Dia. (in)	Full Q (cfs)	Velocity Full (ft/s)	Velocity Design (ft/s)	Invert Elevation		Slope
From	To												U/S	D/S	
1 (51)	1 (52)	278	0.20	0.50	7	12.17	2.7	2.7	18	5.7	3.24	3.20	0.90	0.08	0.30%
1 (23)	1 (51)	174	0.04	0.70	5	12.61	1.6	1.6	18	5.7	3.24	2.76	1.42	0.90	0.30%
1 (22)	1 (23)	44	0.09	0.70	5	12.73	1.2	1.2	18	5.7	3.22	2.56	1.55	1.42	0.29%
1 (49)	1 (22)	51	0.01	0.70	5	12.80	0.4	0.4	15	15.7	12.78	5.28	5.05	2.08	5.89%
1 (48)	1 (49)	10	0.02	0.70	5	12.80	0.1	0.1	12	8.2	10.40	3.98	5.56	5.05	5.24%
1 (50)	1 (49)	9	0.01	0.70	5	12.80	0.1	0.1	15	15.3	12.46	3.79	5.56	5.05	5.59%
1 (18)	1 (20)	251	0.01	0.55	5	12.80	0.4	0.4	18	5.1	2.91	1.77	2.60	2.00	0.24%
1 (16)	1 (18)	40	0.05	0.55	5	12.80	0.4	0.4	18	6.4	3.63	1.96	2.75	2.60	0.37%

Structure	Q=CIA/Kc (cfs)	Known Q (cfs)	Longitudinal Slope SL (ft/ft)	Cross Slope *Sx* (ft/ft)	Cross Slope *Sw* (ft/ft)	Total Gutter Flow (cfs)	Depth *d* (ft)	Gutter Width (ft)	Inlet Type	Grate Length (in)	Grate Width (in)	Curb Opening Length (in)	Curb Opening Height (in)	Intercept Flow Q*i* (cfs)
1 (22)	0.9		-1.00	0.02	0.05	0.9	0.1	2.0	Grate inlet	36.0	24.0			0.9
1 (23)	0.4		-1.00	0.02	0.05	0.4	0.0	2.0	Grate inlet	36.0	24.0			0.4
1 (48)	0.1		-1.00	0.02	0.05	0.1	-0.0	2.0	Grate inlet	24.0	24.0			0.1
1 (49)	0.1		-1.00	0.02	0.05	0.1	-0.1	2.0	Grate inlet	24.0	24.0			0.1
1 (50)	0.1		-1.00	0.02	0.05	0.1	-0.1	2.0	Grate inlet	24.0	24.0			0.1
1 (51)	1.3		-1.00	0.02	0.05	1.3	0.2	2.0	Grate inlet	24.0	24.0			1.3
1 (16)	0.4		-1.00	0.02	0.05	0.4	0.0	2.0	Grate inlet	36.0	24.0			0.4
1 (18)	0.1		-1.00	0.02	0.05	0.1	-0.1	2.0	Grate inlet	36.0	24.0			0.1

Struct. ID	*Q* (cfs)	*EGLo* (ft)	*HGLo* (ft)	Total Pipe Loss (ft)	*EGLi* (ft)	*HGLi* (ft)	*Ea* (ft)	*EGLa* (ft)	Surface Elev. (ft)
B1		2.95	2.95						5.50
B2	6.4	3.54	3.34	0.22	3.76	3.56	1.8	3.81	5.48
B3	5.7	3.88	3.72	0.18	4.06	3.90	1.9	4.12	5.10
E1		3.48	3.48						6.63
E2	0.8	3.56	3.56	0.12	3.68	3.60	1.6	3.73	6.49
E3	0.3	3.73	3.73		3.73	3.73	1.5	3.73	6.51
E4	0.3	3.73	3.73	0.22	3.94	3.89	1.5	3.97	5.98
F1		2.63	2.63						6.63
F2	1.3	3.19	3.08	0.18	3.37	3.26	0.7	3.43	6.48
2 (59)		2.94	2.94						2.37
D1	4.6	3.05	2.94	0.04	3.08	2.98	2.5	3.14	5.18
D2	4.6	3.18	3.08	0.01	3.19	3.09	2.6	3.28	5.32
D3	4.5	3.33	3.22	0.13	3.46	3.36	2.6	3.48	5.22
D4	4.2	3.52	3.43	0.25	3.77	3.68	2.5	3.79	5.09
D5	2.7	3.81	3.77	0.06	3.86	3.83	2.3	3.88	5.22
C1-A		2.63	2.63						3.30
C1-B	8.6	3.62	3.50	0.01	3.63	3.51	2.1	3.65	3.31
C2	8.7	3.70	3.58	0.06	3.76	3.64	2.3	3.80	5.00
C3(0)	8.7	3.85	3.73	0.07	3.92	3.80	2.4	3.97	5.57
C3	4.9	4.02	3.90	0.01	4.03	3.92	2.5	4.06	3.41
C12	4.9	4.11	3.99	0.01	4.12	4.00	2.6	4.18	5.47
C13	1.6	4.18	4.17	0.03	4.21	4.20	2.2	4.22	6.07
2 (99)	5.5	4.03	3.88	0.17	4.20	4.05	2.6	4.23	3.47
C4	5.5	4.29	4.14	0.09	4.38	4.23	2.7	4.42	5.15
C5	4.7	4.46	4.35	0.17	4.63	4.52	2.9	4.65	4.99
C6	4.1	4.68	4.60	0.16	4.84	4.76	3.0	4.91	5.21
C7	3.7	4.93	4.87	0.06	4.99	4.93	3.1	5.05	5.99
C8	3.6	5.07	5.01	0.08	5.15	5.09	3.2	5.17	6.14
C9	3.3	5.19	5.13	0.05	5.24	5.19	3.2	5.25	6.32
C10	3.2	5.27	5.22	0.14	5.41	5.36	3.2	5.45	6.65
C11	2.1	5.46	5.43	0.02	5.47	5.45	3.2	5.48	6.00
A1		2.63	2.63						2.80
A2	4.8	2.74	2.63	0.05	2.79	2.68	1.8	2.84	4.96
A3	4.8	2.88	2.77	0.12	3.00	2.89	1.8	3.03	5.81
A4	4.8	3.07	2.96	0.04	3.11	2.99	1.8	3.13	4.82
A5	4.8	3.18	3.06	0.01	3.19	3.07	1.9	3.28	4.75
A6	2.9	3.30	3.25	0.07	3.37	3.33	1.8	3.38	4.82
A7	1.6	3.39	3.38	0.02	3.41	3.40	1.5	3.41	4.82
A8	1.0	3.28	3.27	0.01	3.29	3.28	1.9	3.29	4.78

Structure ID		Length (ft)	Drainage Area (ac)	Runoff Coeff "C"	Tc (min)	Rain "I" (in/hr)	Runoff "Q" (cfs)	Total Q (cfs)	Pipe Dia. (in)	Full Q (cfs)	Velocity Full (ft/s)	Velocity Design (ft/s)	Invert Elevation		Slope
From	To												U/S	D/S	
B2	B1	109	0.16	0.50	6	9.15	6.4	6.4	18	4.7	2.67	3.60	2.06	1.84	0.20%
B3	B2	62	1.23	0.50	6	9.25	5.7	5.7	18	4.7	2.65	3.23	2.18	2.06	0.20%
E2	E1	39	0.07	0.70	7	8.94	0.8	0.8	18	5.8	3.26	2.28	2.12	2.00	0.30%
E3	E2	38			6	9.37	0.3	0.3	18	5.8	3.26	1.79	2.23	2.12	0.30%
E4	E3	73	0.05	0.70	5	9.56	0.3	0.3	18	5.8	3.26	1.80	2.45	2.23	0.30%
F2	F1	58	0.19	0.70	5	9.56	1.3	1.3	18	5.8	3.26	2.63	2.78	2.60	0.30%
D1	2 (59)	19			8	8.76	4.6	4.6	18	5.8	3.26	3.62	0.62	0.57	0.30%
D2	D1	8	0.02	0.70	8	8.78	4.6	4.6	18	5.8	3.26	3.62	0.65	0.62	0.30%
D3	D2	73	0.09	0.50	7	8.88	4.5	4.5	18	5.8	3.26	3.60	0.87	0.65	0.30%
D4	D3	157	0.33	0.50	6	9.11	4.2	4.2	18	5.8	3.26	3.55	1.34	0.87	0.30%
D5	D4	87	0.59	0.50	6	9.25	2.7	2.7	18	5.8	3.26	3.21	1.60	1.34	0.30%
C1-B	C1-A	9			20	5.83	8.6	8.6	24	7.1	2.27	2.75	1.51	1.50	0.10%
C2	C1-B	44	0.10	0.10	20	5.87	8.7	8.7	24	7.2	2.28	2.76	1.55	1.51	0.10%
C3(0)	C2	45			20	5.90	8.7	8.7	24	7.3	2.31	2.76	1.60	1.55	0.10%
C3	C3(0)	7			7	8.93	4.9	4.9	18	3.7	2.07	2.75	1.60	1.60	0.10%
C12	C3	5	0.54	0.70	7	8.94	4.9	4.9	18	3.3	1.88	2.75	1.61	1.61	0.10%
C13	C12	124	0.23	0.70	5	9.56	1.6	1.6	18	5.8	3.26	2.77	1.99	1.61	0.30%
2 (99)	C3(0)	72			19	5.94	5.5	5.5	18	3.7	2.07	3.11	1.67	1.60	0.10%
C4	2 (99)	31	0.27	0.50	19	5.96	5.5	5.5	18	3.3	1.88	3.12	1.70	1.67	0.10%
C5	C4	82	0.23	0.50	19	6.02	4.7	4.7	18	3.4	1.90	2.68	1.79	1.71	0.10%
C6	C5	103	0.10	0.70	18	6.11	4.1	4.1	18	3.3	1.88	2.32	1.89	1.79	0.10%
C7	C6	49	0.05	0.50	17	6.16	3.7	3.7	18	3.3	1.88	2.08	1.94	1.89	0.10%
C8	C7	69	0.08	0.50	17	6.22	3.6	3.6	18	3.3	1.88	2.09	2.01	1.94	0.10%
C9	C8	51	0.08	0.50	17	6.27	3.3	3.3	18	3.3	1.88	2.14	2.06	2.01	0.10%
C10	C9	152	0.34	0.50	15	6.41	3.2	3.2	18	3.3	1.88	2.14	2.21	2.06	0.10%
C11	C10	39	0.64	0.50	15	6.45	2.1	2.1	18	3.3	1.88	1.99	2.25	2.21	0.10%
A2	A1	26			14	6.80	4.8	4.8	18	6.2	3.53	3.89	1.08	1.00	0.30%
A3	A2	66	0.01	0.50	14	6.89	4.8	4.8	18	6.2	3.52	3.89	1.27	1.08	0.30%
A4	A3	17			14	6.91	4.8	4.8	18	5.8	3.29	3.67	1.33	1.27	0.31%
A5	A4	7	0.34	0.50	13	6.92	4.8	4.8	18	5.8	3.26	3.65	1.35	1.33	0.30%
A6	A5	96	0.40	0.50	13	7.07	2.9	2.9	18	5.8	3.26	3.27	1.63	1.35	0.30%
A7	A6	82	0.43	0.50	12	7.38	1.6	1.6	18	5.8	3.26	2.78	1.88	1.63	0.30%
A8	A5	75	0.22	0.50	6	9.25	1.0	1.0	18	4.9	2.76	2.20	1.39	1.23	0.22%

Structure	Q=CIA/Kc (cfs)	Longitudinal Slope SL (ft/ft)	Cross Slope *Sx* (ft/ft)	Cross Slope *Sw* (ft/ft)	Total Gutter Flow (cfs)	Depth *d* (ft)	Gutter Width (ft)	Inlet Type	Grate Length (in)	Grate Width (in)	Curb Opening Length (in)	Curb Opening Height (in)	Intercept Flow *Qi* (cfs)
B3	5.7	-1.00	0.02	0.05	5.7	0.5	2.0	Grate inlet	23.8	23.8			5.7
B2	0.7	-1.00	0.02	0.05	0.7	0.1	2.0	Grate inlet	36.0	24.0			0.7
E4	0.3	-1.00	0.02	0.05	0.3	0.0	2.0	Grate inlet	23.8	23.8			0.3
E2	0.5	-1.00	0.02	0.05	0.5	0.0	2.0	Grate inlet	36.0	24.0			0.5
F2	1.3	-1.00	0.02	0.05	1.3	0.2	2.0	Grate inlet	36.0	24.0			1.3
D5	2.7	-1.00	0.02	0.05	2.7	0.3	2.0	Grate inlet	23.8	23.8			2.7
D4	1.6	-1.00	0.02	0.05	1.6	0.2	2.0	Curb inlet			144.0	5.0	1.6
D3	0.5	-1.00	0.02	0.05	0.5	0.1	2.0	Curb inlet			144.0	5.0	0.5
D2	0.2	-1.00	0.02	0.05	0.2	0.1	2.0	Curb inlet			144.0	5.0	0.2
C5	1.1	-1.00	0.02	0.05	1.1	0.1	2.0	Grate inlet	36.0	24.0			1.1
C6	0.7	-1.00	0.02	0.05	0.7	0.1	2.0	Grate inlet	36.0	24.0			0.7
C13	1.6	-1.00	0.02	0.05	1.6	0.2	2.0	Grate inlet	36.0	24.0			1.6
C12	3.4	-1.00	0.02	0.05	3.4	0.3	2.0	Grate inlet	36.0	24.0			3.4
C4	1.3	-1.00	0.02	0.05	1.3	0.1	2.0	Grate inlet	36.0	24.0			1.3
C2	0.1	-1.00	0.02	0.05	0.1	-0.1	2.0	Grate inlet	24.0	24.0			0.1
C7	0.2	-1.00	0.02	0.05	0.2	-0.1	2.0	Grate inlet	36.0	24.0			0.2
C9	0.4	-1.00	0.02	0.05	0.4	-0.0	2.0	Grate inlet	36.0	24.0			0.4
C10	1.6	-1.00	0.02	0.05	1.6	0.2	2.0	Grate inlet	36.0	24.0			1.6
C11	2.1	-1.00	0.02	0.05	2.1	0.2	2.0	Curb inlet			144.0	5.0	2.1
C8	0.4	-1.00	0.02	0.05	0.4	-0.0	2.0	Grate inlet	36.0	24.0			0.4
A6	1.4	-1.00	0.02	0.05	1.4	0.2	2.0	Grate inlet	36.0	24.0			1.4
A8	1.0	-1.00	0.02	0.05	1.0	0.1	2.0	Grate inlet	36.0	24.0			1.0
A7	1.6	-1.00	0.02	0.05	1.6	0.2	2.0	Grate inlet	36.0	24.0			1.6
A5	1.5	-1.00	0.02	0.05	1.5	0.2	2.0	Grate inlet	36.0	24.0			1.5
A3	0.0	-1.00	0.02	0.05	0.0	-0.1	2.0	Grate inlet	36.0	24.0			0.0

Struct. ID	*Q* (cfs)	*EGLo* (ft)	*HGLo* (ft)	Total Pipe Loss (ft)	*EGLi* (ft)	*HGLi* (ft)	*Ea* (ft)	*EGLa* (ft)	Surface Elev. (ft)
B1		2.95	2.95						5.50
B2	7.2	3.60	3.34	0.22	3.82	3.56	1.8	3.89	5.48
B3	6.5	3.97	3.76	0.23	4.20	3.99	2.1	4.27	5.10
E1		3.48	3.48						6.63
E2	0.9	3.57	3.57	0.12	3.69	3.60	1.6	3.74	6.49
E3	0.4	3.74	3.74		3.74	3.74	1.5	3.74	6.51
E4	0.4	3.74	3.74		3.74	3.74	1.3	3.74	5.98
F1		2.63	2.63						6.63
F2	1.5	3.23	3.12	0.18	3.41	3.29	0.7	3.48	6.48
2 (59)		2.94	2.94						2.37
D1	5.2	3.07	2.94	0.05	3.12	2.99	2.6	3.19	5.18
D2	5.2	3.25	3.11	0.02	3.27	3.13	2.7	3.38	5.32
D3	5.1	3.43	3.30	0.17	3.60	3.47	2.8	3.63	5.22
D4	4.7	3.68	3.57	0.32	4.00	3.88	2.7	4.02	5.09
D5	3.1	4.04	4.00	0.07	4.12	4.07	2.5	4.13	5.22
C1-A		2.63	2.63						3.88
C1-B	9.8	3.65	3.50	0.01	3.66	3.51	2.2	3.69	3.88
C2	9.9	3.75	3.60	0.08	3.83	3.68	2.3	3.87	5.00
C3(0)	9.8	3.93	3.78	0.08	4.02	3.86	2.5	4.11	6.95
C3	5.5	4.17	4.02	0.02	4.19	4.04	2.6	4.22	3.41
C12	5.5	4.28	4.13	0.01	4.29	4.14	2.8	4.36	5.47
C13	1.8	4.37	4.35	0.03	4.40	4.39	2.4	4.41	6.07
2 (99)	6.2	4.19	3.99	0.22	4.40	4.21	2.8	4.44	3.47
C4	6.3	4.52	4.33	0.11	4.63	4.44	3.0	4.68	5.15
C5	5.4	4.73	4.59	0.21	4.95	4.81	3.2	4.98	4.99
C6	4.6	5.02	4.91	0.20	5.22	5.11	3.4	5.30	5.21
C7	4.1	5.34	5.25	0.08	5.41	5.33	3.5	5.48	5.99
C8	4.0	5.52	5.44	0.10	5.62	5.54	3.6	5.63	6.14
C9	3.8	5.66	5.59	0.07	5.73	5.66	3.7	5.74	6.32
C10	3.6	5.77	5.71	0.18	5.94	5.88	3.8	5.99	6.65
C11	2.4	6.00	5.97	0.02	6.02	5.99	3.8	6.02	6.00
A1		2.63	2.63						2.80
A2	5.4	2.77	2.63	0.06	2.83	2.69	1.8	2.89	4.96
A3	5.4	2.95	2.81	0.15	3.10	2.95	1.9	3.13	5.22
A4	5.4	3.19	3.04	0.04	3.23	3.09	1.9	3.26	4.82
A5	5.4	3.32	3.18	0.02	3.34	3.19	2.1	3.45	4.75
A6	3.3	3.47	3.42	0.09	3.57	3.51	2.0	3.59	4.82
A7	1.8	3.59	3.58	0.02	3.62	3.60	1.7	3.62	4.82
A8	1.2	3.45	3.45	0.01	3.46	3.46	2.1	3.47	4.78

HEC-22
Storm Drain Computations
Proposed Drainage - 25 yr

Structure ID		Length (ft)	Drainage Area (ac)	Runoff Coeff "C"	Tc (min)	Rain "I" (in/hr)	Runoff "Q" (cfs)	Total Q (cfs)	Pipe Dia. (in)	Full Q (cfs)	Velocity Full (ft/s)	Velocity Design (ft/s)	Invert Elevation		Slope
From	To												U/S	D/S	
B2	B1	109	0.16	0.50	6	10.35	7.2	7.2	18	4.7	2.67	4.08	2.06	1.84	0.20%
B3	B2	62	1.23	0.50	6	10.45	6.5	6.5	18	4.7	2.65	3.65	2.18	2.06	0.20%
E2	E1	39	0.07	0.70	7	10.09	0.9	0.9	18	5.8	3.26	2.36	2.12	2.00	0.30%
E3	E2	38			6	10.59	0.4	0.4	18	5.8	3.26	1.85	2.23	2.12	0.30%
E4	E3	73	0.05	0.70	5	10.80	0.4	0.4	18	5.8	3.26	1.86	2.45	2.23	0.30%
F2	F1	58	0.19	0.70	5	10.80	1.5	1.5	18	5.8	3.26	2.72	2.78	2.60	0.30%
D1	2 (59)	19			8	9.91	5.2	5.2	18	5.8	3.26	3.69	0.62	0.57	0.30%
D2	D1	8	0.02	0.70	7	9.92	5.2	5.2	18	5.8	3.26	3.69	0.65	0.62	0.30%
D3	D2	73	0.09	0.50	7	10.04	5.1	5.1	18	5.8	3.26	3.68	0.87	0.65	0.30%
D4	D3	157	0.33	0.50	6	10.29	4.7	4.7	18	5.8	3.26	3.64	1.34	0.87	0.30%
D5	D4	87	0.59	0.50	6	10.45	3.1	3.1	18	5.8	3.26	3.31	1.60	1.34	0.30%
C1-B	C1-A	9			20	6.64	9.8	9.8	24	7.1	2.27	3.13	1.51	1.50	0.10%
C2	C1-B	43	0.10	0.10	20	6.67	9.9	9.9	24	7.3	2.32	3.14	1.55	1.51	0.10%
C3(0)	C2	45			19	6.70	9.8	9.8	24	7.3	2.32	3.13	1.60	1.55	0.10%
C3	C3(0)	9			7	10.08	5.5	5.5	18	3.3	1.87	3.10	1.60	1.60	0.08%
C12	C3	4	0.54	0.70	7	10.09	5.5	5.5	18	3.6	2.03	3.10	1.61	1.61	0.12%
C13	C12	117	0.23	0.70	5	10.80	1.8	1.8	18	5.9	3.35	2.92	1.99	1.61	0.32%
2 (99)	C3(0)	72			19	6.74	6.2	6.2	18	3.7	2.07	3.53	1.67	1.60	0.10%
C4	2 (99)	31	0.27	0.50	19	6.76	6.3	6.3	18	3.3	1.88	3.54	1.70	1.67	0.10%
C5	C4	82	0.23	0.50	18	6.82	5.4	5.4	18	3.4	1.90	3.04	1.79	1.71	0.10%
C6	C5	103	0.10	0.70	18	6.90	4.6	4.6	18	3.3	1.88	2.62	1.89	1.79	0.10%
C7	C6	49	0.05	0.50	17	6.95	4.1	4.1	18	3.3	1.88	2.35	1.94	1.89	0.10%
C8	C7	69	0.08	0.50	17	7.01	4.0	4.0	18	3.3	1.88	2.28	2.01	1.94	0.10%
C9	C8	51	0.08	0.50	17	7.06	3.8	3.8	18	3.3	1.88	2.13	2.06	2.01	0.10%
C10	C9	152	0.34	0.50	15	7.21	3.6	3.6	18	3.3	1.88	2.09	2.21	2.06	0.10%
C11	C10	39	0.64	0.50	15	7.25	2.4	2.4	18	3.3	1.88	2.04	2.25	2.21	0.10%
A2	A1	26			14	7.66	5.4	5.4	18	6.2	3.53	3.97	1.08	1.00	0.30%
A3	A2	66	0.01	0.50	14	7.75	5.4	5.4	18	6.2	3.52	3.97	1.27	1.08	0.30%
A4	A3	17			14	7.78	5.4	5.4	18	5.8	3.29	3.73	1.33	1.27	0.31%
A5	A4	7	0.34	0.50	13	7.79	5.4	5.4	18	5.8	3.26	3.70	1.35	1.33	0.30%
A6	A5	96	0.40	0.50	13	7.96	3.3	3.3	18	5.8	3.26	3.37	1.63	1.35	0.30%
A7	A6	82	0.43	0.50	12	8.32	1.8	1.8	18	5.8	3.26	2.87	1.88	1.63	0.30%
A8	A5	75	0.22	0.50	6	10.45	1.2	1.2	18	4.9	2.76	2.27	1.39	1.23	0.22%

HEC-22
Inlet Capacity Results
Proposed Drainage - 25 yr

Structure	Q=CIA/Kc (cfs)	Known Q (cfs)	Longitudinal Slope SL (ft/ft)	Cross Slope *Sx* (ft/ft)	Cross Slope *Sw* (ft/ft)	Total Gutter Flow (cfs)	Depth *d* (ft)	Gutter Width (ft)	Inlet Type	Grate Length (in)	Grate Width (in)	Curb Opening Length (in)	Curb Opening Height (in)	Intercept Flow Q*i* (cfs)
B3	6.5		-1.00	0.02	0.05	6.5	0.5	2.0	Grate inlet	23.8	23.8			6.5
B2	0.8		-1.00	0.02	0.05	0.8	0.1	2.0	Grate inlet	36.0	24.0			0.8
E4	0.4		-1.00	0.02	0.05	0.4	0.0	2.0	Grate inlet	23.8	23.8			0.4
E2	0.5		-1.00	0.02	0.05	0.5	0.1	2.0	Grate inlet	36.0	24.0			0.5
F2	1.5		-1.00	0.02	0.05	1.5	0.2	2.0	Grate inlet	36.0	24.0			1.5
D5	3.1		-1.00	0.02	0.05	3.1	0.3	2.0	Grate inlet	23.8	23.8			3.1
D4	1.8		-1.00	0.02	0.05	1.8	0.2	2.0	Curb inlet			144.0	5.0	1.8
D3	0.5		-1.00	0.02	0.05	0.5	0.1	2.0	Curb inlet			144.0	5.0	0.5
D2	0.2		-1.00	0.02	0.05	0.2	0.1	2.0	Curb inlet			144.0	5.0	0.2
C5	1.3		-1.00	0.02	0.05	1.3	0.1	2.0	Grate inlet	36.0	24.0			1.3
C6	0.8		-1.00	0.02	0.05	0.8	0.1	2.0	Grate inlet	36.0	24.0			0.8
C13	1.8		-1.00	0.02	0.05	1.8	0.2	2.0	Grate inlet	36.0	24.0			1.8
C12	3.8		-1.00	0.02	0.05	3.8	0.3	2.0	Grate inlet	36.0	24.0			3.8
C4	1.5		-1.00	0.02	0.05	1.5	0.2	2.0	Grate inlet	36.0	24.0			1.5
C2	0.1		-1.00	0.02	0.05	0.1	-0.1	2.0	Grate inlet	24.0	24.0			0.1
C7	0.3		-1.00	0.02	0.05	0.3	-0.0	2.0	Grate inlet	36.0	24.0			0.3
C9	0.4		-1.00	0.02	0.05	0.4		2.0	Grate inlet	36.0	24.0			0.4
C10	1.8		-1.00	0.02	0.05	1.8	0.2	2.0	Grate inlet	36.0	24.0			1.8
C11	2.4		-1.00	0.02	0.05	2.4	0.2	2.0	Curb inlet			144.0	5.0	2.4
C8	0.4		-1.00	0.02	0.05	0.4		2.0	Grate inlet	36.0	24.0			0.4
A6	1.6		-1.00	0.02	0.05	1.6	0.2	2.0	Grate inlet	36.0	24.0			1.6
A8	1.2		-1.00	0.02	0.05	1.2	0.1	2.0	Grate inlet	36.0	24.0			1.2
A7	1.8		-1.00	0.02	0.05	1.8	0.2	2.0	Grate inlet	36.0	24.0			1.8
A5	1.7		-1.00	0.02	0.05	1.7	0.2	2.0	Grate inlet	36.0	24.0			1.7
A3	0.0		-1.00	0.02	0.05	0.0	-0.1	2.0	Grate inlet	36.0	24.0			0.0

Struct. ID	*Q* (cfs)	*EGLo* (ft)	*HGLo* (ft)	Total Pipe Loss (ft)	*EGLi* (ft)	*HGLi* (ft)	*Ea* (ft)	*EGLa* (ft)	Surface Elev. (ft)
B1		2.95	2.95						5.50
B2	8.5	3.70	3.34	0.22	3.92	3.56	2.0	4.02	5.48
B3	7.6	4.13	3.84	0.33	4.46	4.17	2.4	4.54	5.10
E1		3.48	3.48						6.63
E2	1.0	3.58	3.58	0.12	3.70	3.60	1.6	3.75	6.49
E3	0.5	3.75	3.75		3.75	3.75	1.5	3.75	6.51
E4	0.5	3.75	3.75		3.75	3.75	1.3	3.75	5.98
F1		2.63	2.63						6.63
F2	1.7	3.29	3.16	0.18	3.47	3.34	0.8	3.54	6.48
2 (59)		2.94	2.94						2.37
D1	6.2	3.13	2.94	0.06	3.19	3.00	2.7	3.30	5.18
D2	6.2	3.37	3.18	0.03	3.40	3.21	2.9	3.56	5.32
D3	6.0	3.63	3.45	0.24	3.87	3.69	3.1	3.91	5.22
D4	5.6	3.98	3.82	0.45	4.42	4.27	3.1	4.46	5.09
D5	3.7	4.49	4.42	0.10	4.59	4.53	3.0	4.61	5.22
C1-A		2.63	2.63						3.88
C1-B	11.9	3.72	3.50	0.01	3.73	3.51	2.3	3.78	3.88
C2	11.9	3.86	3.64	0.12	3.98	3.76	2.5	4.03	5.00
C3(0)	11.9	4.12	3.90	0.12	4.25	4.03	2.8	4.38	6.95
C3	6.5	4.47	4.26	0.03	4.50	4.29	2.9	4.54	3.41
C12	6.5	4.62	4.41	0.02	4.64	4.43	3.1	4.73	5.47
C13	2.1	4.74	4.72	0.05	4.78	4.76	2.8	4.79	6.07
2 (99)	7.5	4.50	4.22	0.31	4.81	4.53	3.2	4.87	3.47
C4	7.5	4.98	4.70	0.16	5.14	4.86	3.5	5.20	5.15
C5	6.4	5.28	5.08	0.31	5.59	5.39	3.8	5.63	4.99
C6	5.5	5.70	5.54	0.29	5.98	5.83	4.2	6.10	5.21
C7	5.0	6.15	6.03	0.11	6.26	6.14	4.4	6.36	5.99
C8	4.8	6.40	6.29	0.14	6.55	6.43	4.6	6.57	6.14
C9	4.5	6.61	6.51	0.09	6.70	6.60	4.7	6.73	6.32
C10	4.2	6.76	6.67	0.25	7.01	6.92	4.9	7.06	6.65
C11	2.8	7.08	7.04	0.03	7.11	7.07	4.9	7.11	6.00
A1		2.63	2.63						2.80
A2	6.4	2.83	2.63	0.08	2.91	2.71	1.9	3.00	4.96
A3	6.4	3.08	2.88	0.21	3.29	3.09	2.1	3.33	5.22
A4	6.4	3.42	3.21	0.06	3.48	3.27	2.2	3.52	4.82
A5	6.4	3.60	3.40	0.02	3.63	3.42	2.4	3.78	4.75
A6	3.9	3.81	3.73	0.13	3.94	3.87	2.3	3.97	4.82
A7	2.1	3.98	3.95	0.03	4.01	3.99	2.1	4.02	4.82
A8	1.4	3.78	3.77	0.01	3.80	3.79	2.4	3.80	4.78

HEC-22
Storm Drain Computations
Proposed Drainage - 100yr

Structure ID		Length (ft)	Drainage Area (ac)	Runoff Coeff "C"	Tc (min)	Rain "I" (in/hr)	Runoff "Q" (cfs)	Total Q (cfs)	Pipe Dia. (in)	Full Q (cfs)	Velocity Full (ft/s)	Velocity Design (ft/s)	Invert Elevation		Slope
From	To												U/S	D/S	
B2	B1	109	0.16	0.50	6	12.28	8.5	8.5	18	4.7	2.67	4.84	2.06	1.84	0.20%
B3	B2	62	1.23	0.50	6	12.38	7.6	7.6	18	4.7	2.65	4.33	2.18	2.06	0.20%
E2	E1	39	0.07	0.70	7	11.96	1.0	1.0	18	5.8	3.26	2.48	2.12	2.00	0.30%
E3	E2	38			6	12.55	0.5	0.5	18	5.8	3.26	1.95	2.23	2.12	0.30%
E4	E3	73	0.05	0.70	5	12.80	0.5	0.5	18	5.8	3.26	1.96	2.45	2.23	0.30%
F2	F1	58	0.19	0.70	5	12.80	1.7	1.7	18	5.8	3.26	2.85	2.78	2.60	0.30%
D1	2 (59)	19			7	11.75	6.2	6.2	18	5.8	3.26	3.65	0.62	0.57	0.30%
D2	D1	8	0.02	0.70	7	11.76	6.2	6.2	18	5.8	3.26	3.64	0.65	0.62	0.30%
D3	D2	73	0.09	0.50	7	11.90	6.0	6.0	18	5.8	3.26	3.69	0.87	0.65	0.30%
D4	D3	157	0.33	0.50	6	12.20	5.6	5.6	18	5.8	3.26	3.71	1.34	0.87	0.30%
D5	D4	87	0.59	0.50	6	12.38	3.7	3.7	18	5.8	3.26	3.45	1.60	1.34	0.30%
C1-B	C1-A	9			19	8.03	11.9	11.9	24	7.1	2.27	3.78	1.51	1.50	0.10%
C2	C1-B	43	0.10	0.10	19	8.05	11.9	11.9	24	7.3	2.32	3.79	1.55	1.51	0.10%
C3(0)	C2	45			19	8.08	11.9	11.9	24	7.3	2.32	3.78	1.60	1.55	0.10%
C3	C3(0)	9			7	11.95	6.5	6.5	18	3.3	1.87	3.67	1.60	1.60	0.08%
C12	C3	4	0.54	0.70	7	11.96	6.5	6.5	18	3.6	2.03	3.68	1.61	1.61	0.12%
C13	C12	117	0.23	0.70	5	12.80	2.1	2.1	18	5.9	3.35	3.05	1.99	1.61	0.32%
2 (99)	C3(0)	72			18	8.12	7.5	7.5	18	3.7	2.07	4.25	1.67	1.60	0.10%
C4	2 (99)	31	0.27	0.50	18	8.13	7.5	7.5	18	3.3	1.88	4.26	1.70	1.67	0.10%
C5	C4	82	0.23	0.50	18	8.18	6.4	6.4	18	3.4	1.90	3.65	1.79	1.71	0.10%
C6	C5	103	0.10	0.70	17	8.26	5.5	5.5	18	3.3	1.88	3.13	1.89	1.79	0.10%
C7	C6	49	0.05	0.50	17	8.30	5.0	5.0	18	3.3	1.88	2.80	1.94	1.89	0.10%
C8	C7	69	0.08	0.50	17	8.35	4.8	4.8	18	3.3	1.88	2.71	2.01	1.94	0.10%
C9	C8	51	0.08	0.50	16	8.40	4.5	4.5	18	3.3	1.88	2.53	2.06	2.01	0.10%
C10	C9	152	0.34	0.50	15	8.54	4.2	4.2	18	3.3	1.88	2.39	2.21	2.06	0.10%
C11	C10	39	0.64	0.50	15	8.58	2.8	2.8	18	3.3	1.88	2.11	2.25	2.21	0.10%
A2	A1	26			14	9.07	6.4	6.4	18	6.2	3.53	4.02	1.08	1.00	0.30%
A3	A2	66	0.01	0.50	14	9.19	6.4	6.4	18	6.2	3.52	4.00	1.27	1.08	0.30%
A4	A3	17			13	9.22	6.4	6.4	18	5.8	3.29	3.64	1.33	1.27	0.31%
A5	A4	7	0.34	0.50	13	9.23	6.4	6.4	18	5.8	3.26	3.64	1.35	1.33	0.30%
A6	A5	96	0.40	0.50	13	9.42	3.9	3.9	18	5.8	3.26	3.50	1.63	1.35	0.30%
A7	A6	82	0.43	0.50	12	9.85	2.1	2.1	18	5.8	3.26	3.01	1.88	1.63	0.30%
A8	A5	75	0.22	0.50	6	12.38	1.4	1.4	18	4.9	2.76	2.38	1.39	1.23	0.22%

HEC-22
Inlet Capacity Results
Proposed Drainage - 100yr

Structure	Q=CIA/Kc (cfs)	Known Q (cfs)	Longitudinal Slope SL (ft/ft)	Cross Slope *Sx* (ft/ft)	Cross Slope *Sw* (ft/ft)	Total Gutter Flow (cfs)	Depth *d* (ft)	Gutter Width (ft)	Inlet Type	Grate Length (in)	Grate Width (in)	Curb Opening Length (in)	Curb Opening Height (in)	Intercept Flow Q*i* (cfs)
B3	7.6		-1.00	0.02	0.05	7.6	0.6	2.0	Grate inlet	23.8	23.8			7.6
B2	1.0		-1.00	0.02	0.05	1.0	0.1	2.0	Grate inlet	36.0	24.0			1.0
E4	0.5		-1.00	0.02	0.05	0.5	0.1	2.0	Grate inlet	23.8	23.8			0.5
E2	0.6		-1.00	0.02	0.05	0.6	0.1	2.0	Grate inlet	36.0	24.0			0.6
F2	1.7		-1.00	0.02	0.05	1.7	0.2	2.0	Grate inlet	36.0	24.0			1.7
D5	3.7		-1.00	0.02	0.05	3.7	0.3	2.0	Grate inlet	23.8	23.8			3.7
D4	2.1		-1.00	0.02	0.05	2.1	0.2	2.0	Curb inlet			144.0	5.0	2.1
D3	0.6		-1.00	0.02	0.05	0.6	0.1	2.0	Curb inlet			144.0	5.0	0.6
D2	0.2		-1.00	0.02	0.05	0.2	0.1	2.0	Curb inlet			144.0	5.0	0.2
C5	1.5		-1.00	0.02	0.05	1.5	0.2	2.0	Grate inlet	36.0	24.0			1.5
C6	0.9		-1.00	0.02	0.05	0.9	0.1	2.0	Grate inlet	36.0	24.0			0.9
C13	2.1		-1.00	0.02	0.05	2.1	0.2	2.0	Grate inlet	36.0	24.0			2.1
C12	4.6		-1.00	0.02	0.05	4.6	0.3	2.0	Grate inlet	36.0	24.0			4.6
C4	1.8		-1.00	0.02	0.05	1.8	0.2	2.0	Grate inlet	36.0	24.0			1.8
C2	0.1		-1.00	0.02	0.05	0.1	-0.1	2.0	Grate inlet	24.0	24.0			0.1
C7	0.3		-1.00	0.02	0.05	0.3	-0.0	2.0	Grate inlet	36.0	24.0			0.3
C9	0.5		-1.00	0.02	0.05	0.5	0.0	2.0	Grate inlet	36.0	24.0			0.5
C10	2.1		-1.00	0.02	0.05	2.1	0.2	2.0	Grate inlet	36.0	24.0			2.1
C11	2.8		-1.00	0.02	0.05	2.8	0.2	2.0	Curb inlet			144.0	5.0	2.8
C8	0.5		-1.00	0.02	0.05	0.5	0.0	2.0	Grate inlet	36.0	24.0			0.5
A6	1.9		-1.00	0.02	0.05	1.9	0.2	2.0	Grate inlet	36.0	24.0			1.9
A8	1.4		-1.00	0.02	0.05	1.4	0.2	2.0	Grate inlet	36.0	24.0			1.4
A7	2.1		-1.00	0.02	0.05	2.1	0.2	2.0	Grate inlet	36.0	24.0			2.1
A5	2.0		-1.00	0.02	0.05	2.0	0.2	2.0	Grate inlet	36.0	24.0			2.0
A3	0.0		-1.00	0.02	0.05	0.0	-0.1	2.0	Grate inlet	36.0	24.0			0.0

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HYDROLOGIC AND HYDRAULIC DESIGN REPORT

PALM BLVD. DRAINAGE IMPROVEMENTS

EXHIBITS

J – 27670.0010

February 2025

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Waterway Blvd. Pathway

Charleston County, South Carolina

Drainage Map - 22nd Avenue, 23rd Avenue, and 25th Avenue Basins

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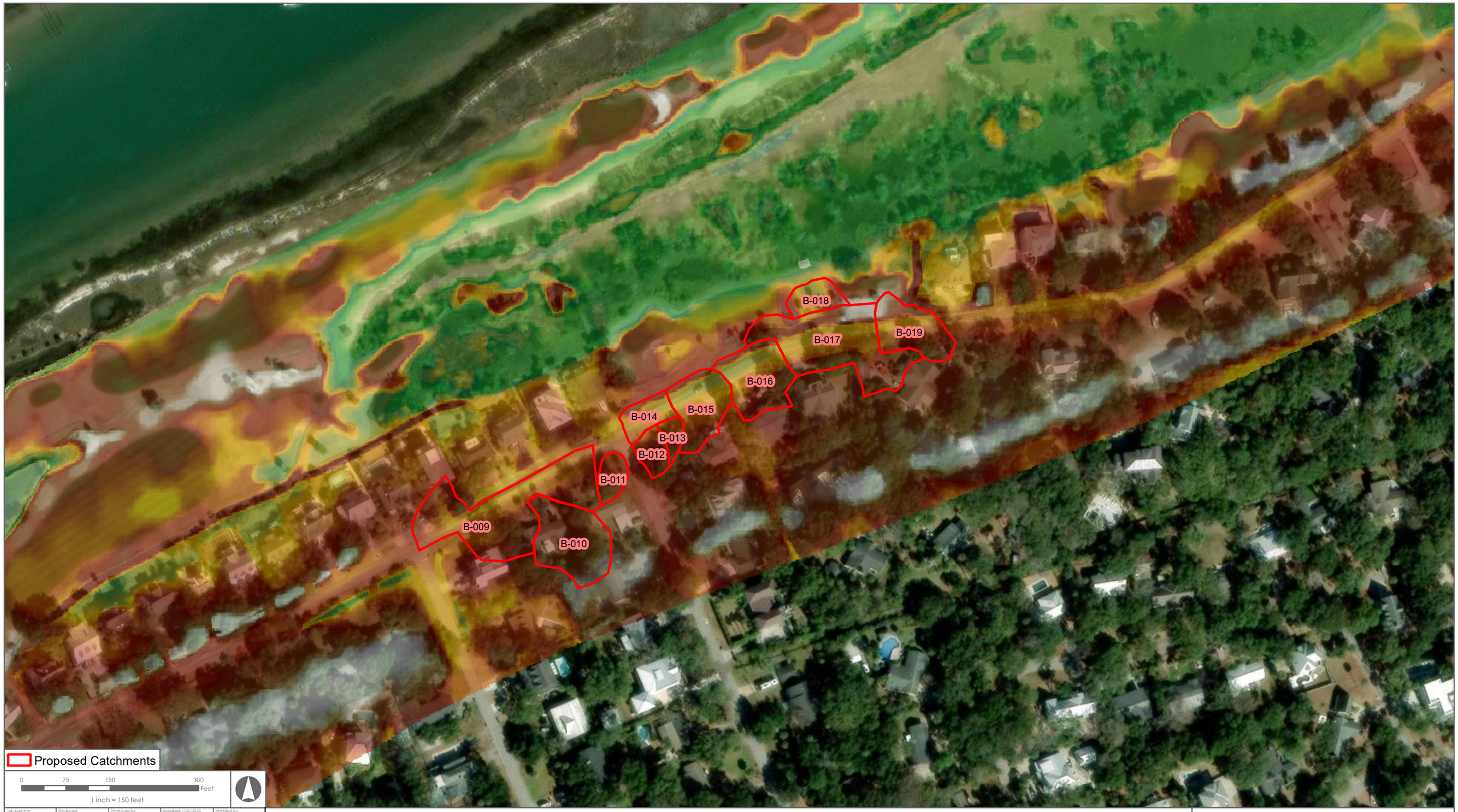

Proposed Catchments

0 75 150 300 Feet

1 inch = 150 feet

Job Number:	Produced:	Produced By:	Modified: 1/30/2025	Modified By:
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Waterway Blvd. Pathway

Charleston County, South Carolina

Drainage Map - Shady Lane and 32nd Avenue

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Waterway Blvd. Pathway

Charleston County, South Carolina

Drainage Map - Forest Trails and Sparrow Lane

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Appendix E

Inspection Log and Reports

SWPPP Inspection Log

SWPPP Inspection Log			
Name of Construction Site	**Location of Construction Site**		
Date of Inspection	**Inspector Name**	**Does Inspection Report require maintenance of installed BMPs?**	
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No

SWPPP Inspection Log (Continued)			
Date of Inspection	**Inspector Name**	**Does Inspection Report require maintenance of installed BMPs?**	
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No

Appendix F

Rainfall Log and Reports

SWPPP Rainfall Records

SWPPP Rainfall Records (January - June)										Year:	
January	Rainfall	February	Rainfall	March	Rainfall	April	Rainfall	May	Rainfall	June	Rainfall
1		1		1		1		1		1	
2		2		2		2		2		2	
3		3		3		3		3		3	
4		4		4		4		4		4	
5		5		5		5		5		5	
6		6		6		6		6		6	
7		7		7		7		7		7	
8		8		8		8		8		8	
9		9		9		9		9		9	
10		10		10		10		10		10	
11		11		11		11		11		11	
12		12		12		12		12		12	
13		13		13		13		13		13	
14		14		14		14		14		14	
15		15		15		15		15		15	
16		16		16		16		16		16	
17		17		17		17		17		17	
18		18		18		18		18		18	
19		19		19		19		19		19	
20		20		20		20		20		20	
21		21		21		21		21		21	
22		22		22		22		22		22	
23		23		23		23		23		23	
24		24		24		24		24		24	
25		25		25		25		25		25	
26		26		26		26		26		26	
27		27		27		27		27		27	
28		28		28		28		28		28	
29		29		29		29		29		29	
30				30		30		30		30	
31				31				31			

SWPPP Rainfall Records (July - December)										Year:	
July	Rainfall	August	Rainfall	September	Rainfall	October	Rainfall	November	Rainfall	December	Rainfall
1		1		1		1		1		1	
2		2		2		2		2		2	
3		3		3		3		3		3	
4		4		4		4		4		4	
5		5		5		5		5		5	
6		6		6		6		6		6	
7		7		7		7		7		7	
8		8		8		8		8		8	
9		9		9		9		9		9	
10		10		10		10		10		10	
11		11		11		11		11		11	
12		12		12		12		12		12	
13		13		13		13		13		13	
14		14		14		14		14		14	
15		15		15		15		15		15	
16		16		16		16		16		16	
17		17		17		17		17		17	
18		18		18		18		18		18	
19		19		19		19		19		19	
20		20		20		20		20		20	
21		21		21		21		21		21	
22		22		22		22		22		22	
23		23		23		23		23		23	
24		24		24		24		24		24	
25		25		25		25		25		25	
26		26		26		26		26		26	
27		27		27		27		27		27	
28		28		28		28		28		28	
29		29		29		29		29		29	
30		30		30		30		30		30	
31		31				31				31	

Appendix G

Additional Site Logs and Records

SWPPP Pre-Construction Conference Attendance Log

SWPPP Contractor & Sub-Contractor Log

SWPPP Modification Log

SWPPP Soil Stabilization Log

SWPPP Pre-Construction Conference Attendance Log

Date & Time	Description/Outline and Name of the Presenter of SWPPP and Site Requirements

Name	Company	Signature

SWPPP Pre-Construction Conference Attendance Log (Continued)

Name	Company	Signature

SWPPP Contractor & Sub-Contractor Log

Name of Construction Site	Location of Construction Site

Company/Individual Name		Work Responsibilities
1.)		
Start Date:		
Completion Date:		
2.)		
Start Date:		
Completion Date:		
3.)		
Start Date:		
Completion Date:		
4.)		
Start Date:		
Completion Date:		
5.)		
Start Date:		
Completion Date:		
6.)		
Start Date:		
Completion Date:		
7.)		
Start Date:		
Completion Date:		
8.)		
Start Date:		
Completion Date:		
9.)		
Start Date:		
Completion Date:		
10.)		
Start Date:		
Completion Date:		

SWPPP Contractor & Sub-Contractor Log (Continued)		
11.)		
Start Date:		
Completion Date:		
12.)		
Start Date:		
Completion Date:		
13.)		
Start Date:		
Completion Date:		
14.)		
Start Date:		
Completion Date:		
15.)		
Start Date:		
Completion Date:		
16.)		
Start Date:		
Completion Date:		
17.)		
Start Date:		
Completion Date:		
18.)		
Start Date:		
Completion Date:		
19.)		
Start Date:		
Completion Date:		
20.)		
Start Date:		
Completion Date:		
21.)		
Start Date:		
Completion Date:		

SWPPP Modification Log

Name of Construction Site	Location of Construction Site

Type of Modification		Description of Modification	Location of Modification
☐ Major ☐ Minor			
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

Type of Modification		Description of Modification	Location of Modification
☐ Major ☐ Minor			
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

Type of Modification		Description of Modification	Location of Modification
☐ Major ☐ Minor			
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

Type of Modification		Description of Modification	Location of Modification
☐ Major ☐ Minor			
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

Type of Modification		Description of Modification	Location of Modification
☐ Major ☐ Minor			
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

SWPPP Modification Log (Continued)

Name of Construction Site	Location of Construction Site

Type of Modification		Description of Modification	Location of Modification
☐ Major ☐ Minor			
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

Type of Modification		Description of Modification	Location of Modification
☐ Major ☐ Minor			
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

Type of Modification		Description of Modification	Location of Modification
☐ Major ☐ Minor			
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

Type of Modification		Description of Modification	Location of Modification
☐ Major ☐ Minor			
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

Type of Modification		Description of Modification	Location of Modification
☐ Major ☐ Minor			
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

SWPPP Soil Stabilization Log

Name of Construction Site	Location of Construction Site

Type of Stabilization	Description of Stabilization	Location of Stabilization
☐ Final ☐ Temporary		
Initiate Date:		
Completion Date:		
Additional work proposed for this area:	Inspection Frequency for Stabilized Area:	

Type of Stabilization	Description of Stabilization	Location of Stabilization
☐ Final ☐ Temporary		
Initiate Date:		
Completion Date:		
Additional work proposed for this area:	Inspection Frequency for Stabilized Area:	

Type of Stabilization	Description of Stabilization	Location of Stabilization
☐ Final ☐ Temporary		
Initiate Date:		
Completion Date:		
Additional work proposed for this area:	Inspection Frequency for Stabilized Area:	

Type of Stabilization	Description of Stabilization	Location of Stabilization
☐ Final ☐ Temporary		
Initiate Date:		
Completion Date:		
Additional work proposed for this area:	Inspection Frequency for Stabilized Area:	

Type of Stabilization	Description of Stabilization	Location of Stabilization
☐ Final ☐ Temporary		
Initiate Date:		
Completion Date:		
Additional work proposed for this area:	Inspection Frequency for Stabilized Area:	

SWPPP Soil Stabilization Log (Continued)

Name of Construction Site	Location of Construction Site

Type of Stabilization	Description of Stabilization	Location of Stabilization
☐ Final ☐ Temporary Initiate Date: Completion Date:		
Additional work proposed for this area:	Inspection Frequency for Stabilized Area:	

Type of Stabilization	Description of Stabilization	Location of Stabilization
☐ Final ☐ Temporary Initiate Date: Completion Date:		
Additional work proposed for this area:	Inspection Frequency for Stabilized Area:	

Type of Stabilization	Description of Stabilization	Location of Stabilization
☐ Final ☐ Temporary Initiate Date: Completion Date:		
Additional work proposed for this area:	Inspection Frequency for Stabilized Area:	

Type of Stabilization	Description of Stabilization	Location of Stabilization
☐ Final ☐ Temporary Initiate Date: Completion Date:		
Additional work proposed for this area:	Inspection Frequency for Stabilized Area:	

Type of Stabilization	Description of Stabilization	Location of Stabilization
☐ Final ☐ Temporary Initiate Date: Completion Date:		
Additional work proposed for this area:	Inspection Frequency for Stabilized Area:	

Appendix H

Construction General Permit SCR100000

A copy of the NPDES General Permit for Stormwater Discharges from Construction Activities (SCR100000) can be found at the following address:

http://www.scdhec.gov/environment/water/swater/docs/CGP-permit.pdf