

**PROJECT MANUAL
FOR
Murrells Inlet Bike Path Parking Facility**

Bid No. 23-002



GEORGETOWN COUNTY, SOUTH CAROLINA

**VOLUME I
DIVISION 0 – BIDDING AND CONTRACT DOCUMENTS
DIVISION 1 – GENERAL REQUIREMENTS
&
VOLUME II
DIVISION 2 - TECHNICAL SPECIFICATIONS**

**PREPARED BY:
GEORGETOWN COUNTY
ENGINEERING AND CAPITAL PROJECTS,
DEPARTMENT OF PUBLIC SERVICES
AND
DDC ENGINEERS / BOLTON & MENK, INC**



February 3, 2023

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**SECTION 00010
REQUEST FOR BIDS**

Time Line: Invitation for Bid #23-002

Item	Date	Time	Location*
Advertised Date of Issue:	Friday, February 3, 2023	n/a	n/a
Pre-Bid Site Inspection:	INDEPENDENT (on own)	n/a	n/a
Inquiry Cut-Off Time:	Wednesday, February 15, 2023	3:30 PM ET	n/a
Bids Delivery Cut-Off Time:	Wednesday, March 1, 2023	3:30 PM ET	Electronic
*Bid Opening and Tabulation:	Wednesday, March 1, 2023	3:30 PM ET	Hybrid
County Council Consideration (Tentative)	Tuesday, March 14, 2023	5:30 PM ET	Council Chambers
Earliest Possible Notice to Proceed:	Monday, March 20, 2023	n/a	n/a
Final Completion:	230 Days from NTP	n/a	n/a

*Due to the current COVID-19 situation, County offices at the time of this bid posting remain open but access to the public may be limited to support social distancing efforts. At the time of this posting, bid openings may be performed virtually or by a hybrid method and may occur from an alternate secure and/or remote location as needed. A virtual meeting link will be posted under the bid number before the bid opening time so that members of the public may attend the meeting virtually. Vendors may also now attend the meeting in person at the Georgetown County Historic Courthouse, Purchasing Conference Room, 129 Screven St., Suite 239, 29440.

**Bid #23-002, Murrells Inlet Bike Path Parking Lot
Georgetown County, South Carolina**

IMPORTANT COVID-19 NOTICE: Until further notice all bids MUST BE submitted electronically through the Purchasing Department's Vendor Registry webpage. Please click on the following link <http://www.georgetowncountysc.org/172/Purchasing> for instructions on how to submit bids electronically through this system. As always, emailed/faxed bids will not be accepted. Your bid must be submitted electronically through Georgetown County's Purchasing Vendor Registry page to ensure it remains sealed until the scheduled bid opening date and time.

Any scheduled bid openings will still be opened at the designated date and time as listed in the bid document or related addendum. However, at the time of this bid issuance these bid openings may be conducted virtually or by a hybrid method, both virtually and in person. As always, bid openings will be accompanied by at least one witness and bid tabulation results will be posted online for the public's viewing after the bid opening.

Purchasing Contact: **John Bullard**
 Phone (843)545-3082
 Fax: (843)545-3500
 E-mail: JBullard@gtcounty.org

The Georgetown County Department of Public Services is seeking competitive bids from South Carolina Department of Transportation approved contractors for the construction of a parking facility. The project is

located at the southernmost part of Highway 17 Business in Murrells Inlet. The parking is intended to provide safe and convenient access for all citizens utilizing the Murrells Inlet Bike Path. The project will provide 13 new parking stalls for the Murrells Inlet Bike Path. The project consists of 1) Installing new stormwater pipes and structure with minor modifications to the existing structures 2) installing a new driveway connection and parking stalls 3) Erect concrete raised island 4) Landscaping required for the interior and exterior of the parking lot. Work is scheduled to begin in March 2023. The limits of work are described herein along with details that describe specific items of work.

SCOPE OF WORK:

BASE BID:

The project work consists clearing and grubbing within project limits, removing retaining wall, locate all utilities including telecom, coordinate the re-location of required telecom and power utilities, coordinate and re-locate required water and sewer lines, design and construct approved keystone retaining knee wall, installing and connecting approx. 329' of 18" RC and approx. 44' of 15" RC storm drainage pipe, associated catch basins, connection box's and materials to comply with local and SCDOT standards and testing. Placing base course and pervious concrete for 9' X 24' (typ) 13 parking spots, 12' (typ) base and asphalt pavement thru lane centerline approx. 478 LF, raised concrete islands, paving markings and signage to comply with local and SCDOT standards and testing. Project located between Georgetown County Water and Sewer pump Station and Pinnacle Drive parallel with Business Highway 17 Murrells Inlet, SC.

The work performed under this Contract shall include, but may not be limited to: the furnishing of all labor, materials, equipment and services, whether specifically mentioned or not, that is required to complete the Construction of the Work of the project. All requirements of the State of South Carolina and all pertinent administrative regulations shall apply to this project as if herein written out in full.

Project Funding:

Funding for this project will be from a South Carolina Department of Parks, Recreation and Tourism Legislative Grant. This is a lump sum bid. Only the total bid price listed in Section 300, Exhibit A, Item #2 (second line in words) will be read at the bid opening. Exhibit G-Unit Price Schedule is to obtain a set unit pricing to be used for any change orders, if necessary, during the project.

Allowances:

A Utility Allowance is included in the contract for a total of \$30,000 as reflected on the mandatory bid submittal form. See the last page of the Technical Specifications for further details.

Retainage, in the amount of ten percent (10%) of the value of construction costs incurred for the project, shall be withheld until the project has been completed to the satisfaction of Owner.

1) **Site Inspection:**

- a) The bidder is expected to have become familiar with and take into consideration, site conditions which may affect the work and **to check all dimensions at the site.**
- b) Each bidder shall acquaint themselves thoroughly as to the character and nature of the work to be done. Each bidder furthermore shall make a careful examination of the site of the work and inform themselves fully as to the difficulties to be encountered in performance of the work, the facilities for delivering, storing and placing materials and equipment and other conditions relating to construction and labor.

- c) The bidder shall examine the premises and the site and compare them with any applicable drawings and specifications. He/she shall familiarize themselves with the existing conditions such as obstructive area levels and any problems related to erecting the required systems.
- d) No plea of ignorance of conditions that exist or may hereafter exist on the site of the work, or difficulties that may be encountered in the execution of the work, as a result of failure to make necessary investigations and examinations, will be accepted as an excuse for any failure or omission on the part of the Contractor to fulfill in every detail all the requirements of the contract documents and to complete the work for the consideration set forth therein, or as a basis for any claim whatsoever.
- e) Insofar as possible, the Contractor, in carrying out his/her work, must employ such methods or means as will not cause interruption of or interference with the work of any other Contractor, or County personnel at the site.
- f) When boring data is provided by the Owner, the Bidder shall assume responsibility for any conclusions he/she may draw from such data. (S)he may employ his/her own consultants to analyze available information and shall be responsible for any conclusions drawn from that information. The cost of such employment shall be borne solely by the Bidder.

2) Bid Security/Bid Bonding:

- a) Each bid must be accompanied by a Bid Bond for an amount equal to five per-cent (5%) of the total base bid as a guarantee that if the bid is accepted, the required Contract will be executed within fifteen (15) days after receipt of written notice of formal award of Contract. Bids not including such a bid bond will not be considered.
- b) The successful proposer must provide a Performance Bond from a surety company qualified to do business under the laws of the State of South Carolina in the amount of 100 percent (100%) of the contract amount, within fifteen (15) days the after receipt of written notice of formal award of the Contract.
- c) The successful offeror must provide a Payment and Material Bond from a surety company qualified to do business under the laws of the State of South Carolina in the amount of 100 percent (100%) of the contract amount, within fifteen (15) days after receipt of written notice of formal award of Contract.
- d) Should any Surety on the Construction Contract be determined unsatisfactory at any time by the Owner, notice will be given the Contractor who shall immediately provide a new Surety, satisfactory to the Owner and at no additional cost to the Owner. The Contract shall not be operative nor will any payments be due or paid until approval of the bonds has been made by the Owner.

- e) The Bidder shall require the Attorney-in-Fact who executes the required bonds, on behalf of the Surety, to affix thereto a certified and current copy of his Power of Attorney, indicating the monetary limit of such power.
- f) The cost of the bonds shall be included in the construction portion of the base bid.

3) Special Provisions and Conditions:

- a) Bidders shall be licensed as a General Contractor in the State of South Carolina and will hold all Trade Contracts on the project.
- b) Trade Contractors (Prime and Sub-Contractors) shall be qualified to perform work contracted for and shall be licensed as such in the State of South Carolina.
- c) The contractor will be responsible for disposal of any and all removed, unused and surplus materials and any fees and transportation costs associated with the disposal.
- d) The contractor is responsible for contacting the Palmetto Utility Protection Service (P.U.P.S.) at its 811 or toll-free number (1-888-721-7877) between the hours of 7:30 am (ET) and 5:30 pm (ET), Monday through Friday, 72 hours before starting the proposed work.

4) Permits:

The County has obtained and provided permits.

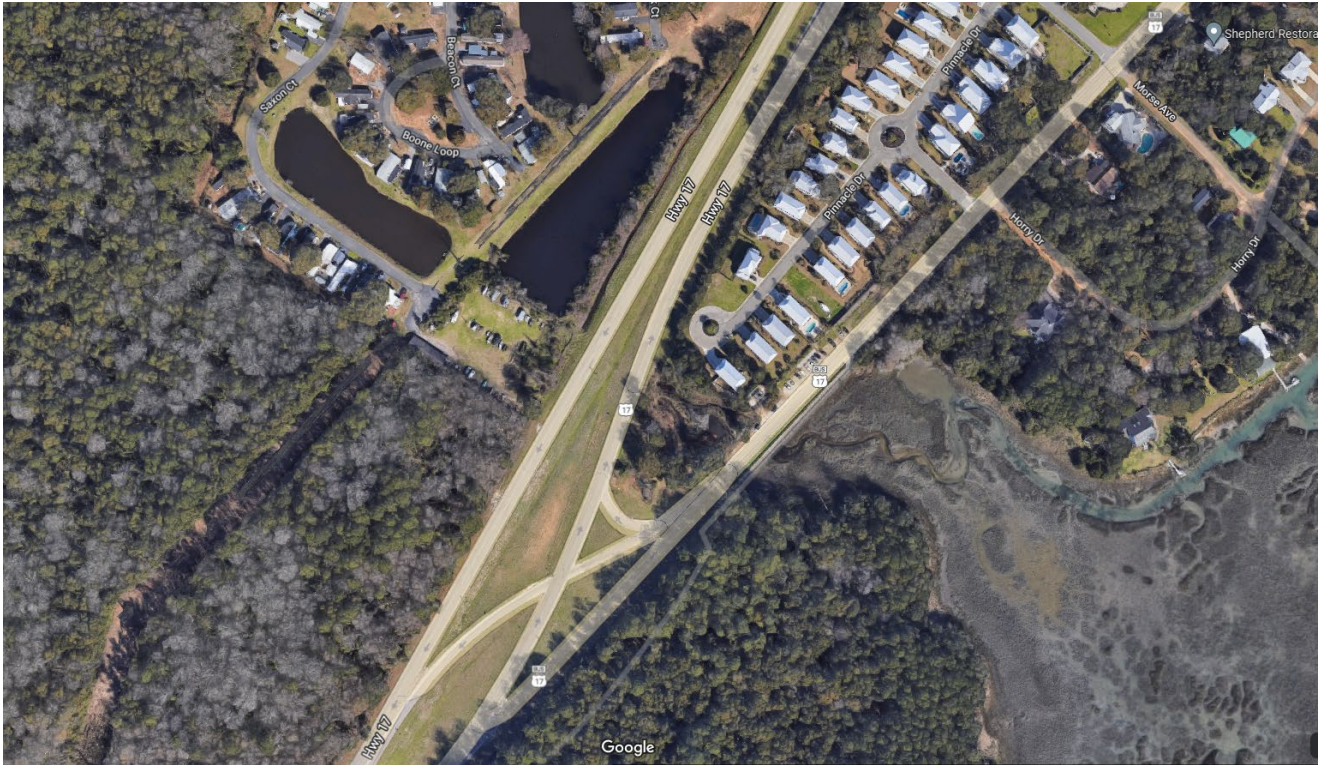
- 5) The Construction Contract will be awarded to the firm or team of firms submitting the lowest and most responsive and responsible proposal as determined by the County. Georgetown County reserves the right to reject any and all proposals for any reason at any time prior to execution of the Contract. It further reserves the right to waive any and all technicalities and formalities in the proposal process as well as accept in whole or in part such proposal or proposals where it deems it advisable in protection of the best interests of the County and to hold all proposals for examination for a period not to exceed ninety (90) calendar days. The selected Contractor is encouraged to utilize, to the extent possible, local firms and trades from within Georgetown County.

Throughout this Project Manual all references to the "Owner" shall mean the County of Georgetown, SC or its Designated Representative.

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Segment Locations

Murrells Inlet Bike Path Parking Facility	
Segment Description:	Back of property at 117 Pinnacle Drive, Murrells Inlet, SC and Highway 17 Business



END OF SECTION 00010



SECTION 00100
INSTRUCTIONS TO BIDDERS
Bid #23-002

These are general instructions and conditions that accompany each bid package. If more specific instructions are given in the individual bid package, those instructions should prevail.

1. **Submission of Questions**

Questions must be submitted in writing via electronic mail, facsimile or postal mail to the Issuing Officer no later than the “Deadline for Questions” cutoff identified in the Bid Timeline on page four (4) in order to generate an official answer. All written questions will receive an official written response from the Georgetown County Purchasing Office (GCPO) and will become addenda to the solicitation.

GCPO reserves the right to reject or deny any requests made by the provider.

Impromptu, unwritten questions are permitted and verbal answers may be provided, but are only intended as general direction and will not represent the official GCPO position. The only official position of GCPO is that which is stated in writing and issued in the solicitation as addenda thereto.

No other means of communication, whether oral or written, shall be construed as a formal or official response/statement and may not be relied upon. **SEND QUESTIONS TO:**

John Bullard, Senior Buyer
Post Office Box 421270, Georgetown, SC 29442-4200
Fax: (843) 545-3500
Email: JBullard@gtcounty.org

2. Electronic sealed bids for to provide MURRELLS INLET BIKE PATH PARKING FACILITY shall be received via the County’s Vendor Registry webpage until the cut-off time shown in the bid timeline on page four (4) of this document. Bids will then be promptly opened at the designated time by the Buyer. Bids that are not received prior to the stated opening date and time will be considered **NON RESPONSIVE**. An official authorized to bind the offer must sign all proposals submitted.
3. **Incident Weather/Closure of County Courthouse**
Due to the current COVID-19 situation, County offices at the time of this bid posting remain open but may be limited to the public. Bid openings at the time of this issuance are being conducted virtually or hybrid and may occur from an alternate secure and/or remote location as needed.
4. This solicitation does not commit Georgetown County to award a contract, to pay any cost incurred in the preparation of the bid, or to procure or contract for goods or services. It is the responsibility of each bidder to see that the Georgetown County Purchasing Office receives bids on, or before, the date and time specified for the bid opening. No bid will be accepted thereafter. The County assumes no responsibility for delivery of bids that are mailed. Georgetown County reserves the right to reject any or all bids and to waive any informalities and technicalities in the bid process.

5. NON EXCLUSIVITY

Nothing herein is intended nor shall be construed as creating any exclusive arrangement with Contractor. Any resulting contract shall not restrict the County from acquiring similar, equal or like goods and/or services from other entities or sources, when Staff determines internally that this resulting action is in the best interest of Georgetown County.

6. No Bidder may submit more than one bid. Multiple bids for different manufacturers but represented by the same firm will not be accepted. Bids offered directly from manufacturers shall indicate if a local dealer/representative will be involved.

7. Definitions:

a) The terms “Proposer”, “Offeror”, “Vendor” or “Bidder” refer to those parties who are submitting sealed responses for the work set forth in this document to the OWNER, as distinct from a sub-bidder who provides a bid to the Bidder. The term “Contractor” refers to the successful Bidder.

b) The term “MURRELLS INLET BIKE PATH PARKING FACILITY” or “the Work” or “Project” refers to the complete set of services as specified in this document, in every aspect.

c) The terms “Owner” and “County” refer to the County of Georgetown, South Carolina.

d) Where the words “shall” or “must” are used, it signifies an absolute minimum function or capacity that, if not satisfied, may result in disqualification.

e) Where the words “should”, “may”, or “is desirable” are used, it signifies desirable, but not mandatory functions or capacities. Bidders who are able to provide these functions or capacities may be evaluated more favorably than those who cannot.

8. Bidders must be licensed as a General Contractor in the State of South Carolina and will hold all Trade Contracts and the Building Permit on the Project.

7. Trade Contractors (Prime and sub-contractors) shall be qualified to perform the work contracted for and shall be licensed as such in the State of South Carolina.

8. Design services shall be performed by qualified architects and engineers licensed to perform the contracted work in the State of South Carolina.

9. Correction or Withdrawal of Bids; Cancellation of Awards

An offeror must submit in writing a request to either correct or withdraw a bid to the Procurement Officer. Each written request must document the fact that the offeror’s mistake is clearly an error that will cause him substantial loss.

a) Correction of awards : An offeror shall not be permitted to correct a bid mistake after bid opening that would cause such offeror to have the low bid unless the mistake in the judgment of the Procurement Officer is clearly evident from examining the bid document; for example, extension of unit prices or errors in addition.

- b) Cancellation of awards prior to performance: When it is determined after an award has been issued but before performance has begun that Georgetown County's requirements for the goods or services have changed or have not been met, the award or contract may be canceled and either re-awarded or a new solicitation issued.

- 10. **Faxed or E-mailed bids will not be accepted by Georgetown County. Electronic bid submissions must be submitted through the Georgetown County Purchasing Vendor Registry page to ensure they remain sealed until the scheduled bid opening date and time.**
- 11. If you need any reasonable accommodation for any type of disability in order to participate in this procurement, please contact the purchasing office as soon as possible.
- 12. Title VI of the Civil Rights Act of 1964: Georgetown County hereby gives public notice that it is the policy of the agency to assure full compliance with Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, Executive Order 12898 on Environmental Justice, and related statutes and regulations in all programs and activities. Title VI requires that no person in the United States of America shall, on the grounds of race, color, or national origin, be excluded from the participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which Georgetown County receives federal financial assistance.
- 13. Any deviations from the specifications or modification of this bid and any extra or incidental work or reductions in work shall be set forth in writing and signed by both parties prior to making such change. Any increase or decrease in the bid price resulting from such change shall be included in writing.
- 14. Exceptions: The bidder shall list on a separate sheet of paper any variations from, or exceptions to, the conditions and specifications of this bid. This sheet shall be labeled "Exception(s) to Bid Conditions and Specifications," and shall be attached to the bid. When Proposers find instances where they must take exception with certain requirements or specifications of the bid, all exceptions shall be clearly identified. Written explanations shall include the scope of the exceptions, the ramifications of the exceptions for the County of Georgetown, and a description of the advantage to be gained or disadvantages to be incurred by the County as a result of these exceptions. If none, write "NONE".
- 15. Georgetown County reserves the right to reject any or all bids, and to waive as an informality any irregularities contained in any bid as may be deemed in the best interest of the County. Georgetown County further reserves the right to reject any bid submitted, at its sole option, that the vendor may not be able to meet the service requirements of the bid.
- 16. Publicity releases: contractor agrees not to refer to award of any resulting contract in commercial advertising in such a manner as to state or imply that the products or services provided are endorsed or preferred by the user.
- 17. Material Safety Data Sheets: The County of Georgetown will not receive any materials, products, or chemicals which may be hazardous to an employee's health unless accompanied by a Material Data Sheet when received.

18. Ownership of Copyright: All right, title and interest in all copyrightable materials which vendor shall create in the performance of its obligations hereunder shall be the property of the procurer. Vendor agrees to assign and hereby does assign any and all interest it has in and to such material to procurer. Vendor agrees, upon the request of procurer to execute all papers and perform all other such acts necessary to assist procurer to obtain and register copyrights on such materials. Where applicable, works of authorship created by the vendor in the performance of its obligations hereunder, shall be considered “works for hire” as defined in the U.S. Copyright Act.
19. Ownership of Documents: Any reports, studies, photographs, negatives or other documents prepared by vendor in the performance of its obligations shall be the exclusive property of the procurer and all such material shall be remitted to the procurer by the vendor upon completion, termination or cancellation of this order. Vendor shall not use, willingly allow or cause to have such material used for any purpose other than performance of its obligations under this order without the prior written consent of the procurer.
20. Affirmative Action: The contractor will take affirmative action in complying with all Federal and State requirements concerning fair employment and employment of the handicapped, and concerning the treatment of all employees, without regard or discrimination by reason of age, race, color, religion, sex, national origin or physical handicap. The following are incorporated herein by reference: 41 C.F.R. 60-1.4, 60-250.4 and 60-741.4.
21. Inclusion and participation of disadvantaged, small, and local business entities is strongly encouraged, but minimum participation standards are not in effect for this project.
22. All Federally Funded or Assisted Construction Contracts Over \$2,000:
 - A. Davis-Bacon Requirements. These contracts need to include a provision for compliance with the Davis-Bacon Act (40 USC 276a to a—7) and the Department of Labor implementing regulations (29 CFR Part 5). Under this Act, Contractors are required to include the contract provisions in Section 5.5 (a) of 29 CFR Part 5, and to pay wages to laborers and mechanics at a rate not less than the minimum wages specified in the wage determination made by the Secretary of Labor. In addition, Contractors shall be required to pay wages not less than the minimum wages specified in the wage determination made by the Secretary of Labor. In addition, Contractors shall be required to pay wages not less often than once a week. Current Wage Determination for Georgetown County in South Carolina is available on-line at: <https://sam.gov/content/wage-determinations>
 - B. Contract Work Hours and Safety Standard Act Requirements. The contracts must include a provision for compliance with Sections 103 and 107 of the Contract Work Hours and Safety Standards Act (40 USC 327-330) as supplemented by the Department of Labor regulations (29 CFR Part 5). Under Section 103 of the Act, each Contractor shall be required to compute the wages of every mechanic and laborer on the basis of a standard workweek of 40 hours. Work in excess of the standard workweek is permissible provided that the worker is compensated at a rate not less than one times the basic rate of pay for all hours worked in excess of 40 hours in the workweek. Section 107 of the Act is applicable to construction work and provides that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to health and safety as determined under construction, safety and health standards promulgated by the Secretary of Labor. These

requirements do not apply to the purchases of supplies, materials, or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

- C. Copeland "Anti-Kickback" Act Requirements. All construction contracts over \$2,000.00 must include a provision for compliance with the Copeland "Anti-Kickback" Act (18 U.S.C. 874) as supplemented in Department of Labor regulations (29 CFR Part 3). This act provides that each Contractor shall be prohibited from inducing, by any means, persons employed in the construction, completion, or repaid of public work to give up any part of their compensation.

23. CERTIFICATION REGARDING DRUG-FREE WORKPLACE:

The contractor certifies that the vendor(s) will provide a "drug-free workplace" as that term is defined in Section 44-107-30 of the Code of Laws of South Carolina, 1976, as amended, by the complying with the requirements set forth in title 44, Chapter 107.

24. Certification of Non-Segregated Facilities

The federally-assisted construction contractor certifies that he does not maintain or provide, for his employees, any segregated facilities at any of his establishments and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally-assisted construction contractor certifies that he will not maintain or provide, for his employees, segregated facilities at any of his establishments and that he will not permit his employees to perform their services at any location under his control where segregated facilities are maintained. The federally-assisted construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this Contract.

As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms, and washrooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated on the basis of race, color, religion, or national origin because of habit, local custom, or any other reason. The federally assisted construction contractor agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause and that he will retain such certifications in his files.

25. Bidders must clearly mark as "confidential" each part of their bid which they consider to be proprietary information that could be exempt from disclosure under section 30-4-40, Code of Laws of South Carolina 1976, as amended (Freedom of Information Act). If any part is designated as confidential, there must be attached to that part an explanation of how this information fits within one or more categories listed in section 30-4-40. The County reserves the right to determine whether this information should be exempt from disclosure and no legal action may be brought against the County or its agents for its determination in this regard.
26. Nothing herein is intended to exclude any responsible vendor, his product or service or in any way restrain or restrict competition. On the contrary, all responsible vendors are encouraged to bid and their bids are solicited.

27. Acknowledgement of Addenda

Each contractor is responsible to verify the number of total addenda issued prior to bid. **Failure to acknowledge all addenda may disqualify the bidder.** All addenda are posted by the County at the website located at www.georgetowncountysc.org, select “Purchasing” and “Current Bids”. It is each proposer’s responsibility to verify that all addenda have been received and acknowledged.

28. This Invitation for Bid covers the estimated requirements to provide MURRELLS INLET PARKING LOT FACILITY for the Georgetown County Department of Public Services, Capital Projects Division. The purpose is to establish a Construction Contract with firm pricing and project schedule.

29. Bids must be made on Proposal or Bid Form furnished or will be rejected. Proposals shall be typewritten or written in ink on the form prepared by the County. The person signing the bid shall initial all corrections or erasures.

30. Insurance

The successful bidder shall procure, maintain, and provide proof of, insurance coverage for injuries to persons and/or property damage as may arise from or in conjunction with, the work performed on behalf of the County by the bidder, his agents, representatives, employees or subcontractors. Proof of coverage as contained herein shall be submitted fifteen (15) days prior to the commencement of work and such coverage shall be maintained by the bidder for the duration of the contract period; for occurrence policies.

a. General Liability

Coverage shall be as broad as: Comprehensive General Liability endorsed to include Broad Form, Commercial General Liability form including Products/Completed Operations.

1. Minimum Limits

General Liability:
\$1,000,000 General Aggregate Limit
\$1,000,000 Products & Completed Operations
\$1,000,000 Personal and Advertising Injury
\$1,000,000 Each Occurrence Limit
\$50,000 Fire Damage Limit
\$5,000 Medical Expense Limit

b. Automobile Liability

Coverage sufficient to cover all vehicles owned, used, or hired by the bidder, his agents, representatives, employees or subcontractors.

1. Minimum Limits

Automobile Liability:
\$1,000,000 Combined Single Limit
\$1,000,000 Each Occurrence Limit
\$5,000 Medical Expense Limit

c. Workers' Compensation

Limits as required by the Workers' Compensation Act of SC. Employers Liability, \$1,000,000.

d. Owners' & Contractors' Protective Liability

Policy will be in name of County. Minimum limits required are \$1,000,000.

e. Professional Liability (a/k/a Errors and Omissions)

N/A.

f. Coverage Provisions

1. All deductibles or self-insured retention shall appear on the certificate(s).
2. The County of Georgetown, its officers/ officials, employees, agents and volunteers shall be added as "additional insured" as their interests may appear. This provision does not apply to Professional Liability or Workers' Compensation/Employers' Liability.
3. The offeror's insurance shall be primary over any applicable insurance or self-insurance maintained by the County.
4. Shall provide 30 days written notice to the County before any cancellation, suspension, or void of coverage in whole or part, where such provision is reasonable.
5. All coverage for subcontractors of the bidder shall be subject to all of the requirements stated herein.
6. All deductibles or self-insured retention shall appear on the certificate(s) and shall be subject to approval by the County. At the option of the County, either; the insurer shall reduce or eliminate such deductible or self-insured retention; or the bidder shall be required to procure a bond guaranteeing payment of losses and related claims expenses.
7. Failure to comply with any reporting provisions of the policy(s) shall not affect coverage provided the County, its officers/officials, agents, employees and volunteers.
8. The insurer shall agree to waive all rights of subrogation against the County, its' officers/officials, agents, employees or volunteers for any act, omission or condition of premises which the parties may be held liable by reason of negligence.
9. The bidder shall furnish the County certificates of insurance including endorsements affecting coverage. The certificates are to be signed by a person authorized by the insurance company(s) to bind coverage on its' behalf, if executed by a broker, notarized copy of authorization to bind, or certify coverage must be attached.
10. All insurance shall be placed with insurers maintaining an A.M. Best rating of no less than an A:VII. If A.M. Best rating is less than A:VII, approval must be received from County's Risk Officer.

31. Workman's Compensation Coverage

Georgetown County, SC will require each contractor and service provider to maintain on file with the purchasing officer, a current Certificate of Insurance showing limits as required by the Workers' Compensation Act of SC: Employers Liability, \$1,000,000.

The law also recognizes "statutory employees." These are employees who work for a subcontractor who may be working for a business or another contractor. Employers should inquire whether or not a subcontractor working for them has workers' compensation insurance, regardless of the number of employees employed by the subcontractor. If the subcontractor does not, the subcontractor's injured employees would be covered under the employer's workers' compensation insurance. If the subcontractor does not carry workers' compensation insurance, then the owner or the principal contractor would be liable just as if the subcontractor's employee was one of their employees.

For answers to additional questions, visit the SC Worker's Compensation Commission website, at: <https://wcc.sc.gov/frequently-asked-questions>

32. Hold Harmless Clause

The Contractor shall, during the term of the contract including any warranty period, indemnify, defend, and hold harmless the County, its officials, employees, agents, and representatives thereof from all suits, actions, or claims of any kind, including attorney's fees, brought on account of any personal injuries, damages, or violations of rights, sustained by any person or property in consequence of any neglect in safeguarding contract work or on account of any act or omission by the contractor or his employees, or from any claims or amounts arising from violation of any law, bylaw, ordinance, regulation or decree. The vendor agrees that this clause shall include claims involving infringement of patent or copyright.

33. Condition of Items

All items shall be new, in first class condition, including containers suitable for shipment and storage, unless otherwise indicated herein. Verbal agreements to the contrary will not be recognized.

34. Workmanship and Inspection

All work under this contract shall be performed in a skillful and workmanlike manner. The County may, in writing, require the Contractor to remove any employee from work that the County deems incompetent or careless.

Further, the County may, from time to time, make inspections of the work performed under this contract. Any inspection by the County does not relieve the Contractor from any responsibility regarding defects or other failures to meet the contract requirements.

35. Progress Payments (If Applicable)

Contractor's Application for Payment shall be submitted to the Owner on AIA Document G702 and G703--1992 Edition, or such other form as may be mutually agreed upon. The period covered by each Application for Payment shall be not less than one calendar month. The Owner shall make progress payments to the Contractor on undisputed amounts certified by the Architect within thirty (30) days from receipt of the Application for Payment by the Owner.

36. South Carolina Sales Tax

The County of Georgetown, SC is not exempt and pays the appropriate SC sales tax on all applicable purchases.

37. Assignment of Contract

This contract may not be assigned in whole or part without the written consent of the Purchasing Officer.

38. Termination

Subject to the provisions below, the contract may be terminated by the County upon sixty (60) days advance written notice to the other party; but if any work or service hereunder is in progress, but not completed as of the date of termination, then this contract may be extended upon written approval of the County until said work or services are completed and accepted.

a. Termination for Convenience

In the event that this contract is terminated or canceled upon request and for the convenience of the County, without the required sixty (60) days advance written notice, then the County shall negotiate reasonable termination costs, if applicable.

b. Termination for Cause

Termination by the County for cause, default or negligence on the part of the contractor shall be excluded from the foregoing provision; termination costs, if any, shall not apply. The sixty (60) days advance notice requirement is waived in the event of Termination for Cause.

c. Non-Appropriation:

It is understood and agreed by the parties that in the event funds are not appropriated in the current fiscal year or any subsequent fiscal years, this contract will become null and void and the County will only be required to pay for services completed to the satisfaction of the County.

39. Default

In case of default by the contractor, for any reason whatsoever, the County may procure the goods or services from another source and hold the contractor responsible for any resulting excess cost and may seek other remedies under law.

40. Severability

In the event that any provision shall be adjudged or decreed to be invalid, such ruling shall not invalidate the entire Agreement but shall pertain only to the provision in question and the remaining provisions shall continue to be valid, binding and in full force and effect.

41. Applicable Laws

This Agreement shall be governed by and construed in accordance with the laws of the State of South Carolina, U.S.A.

42. Claims and Disputes:

All claims, disputes and other matters in question between parties arising out of, or relating to, this Agreement, or the breach thereof, shall be decided in the Circuit Court of the Fifteenth Judicial circuit in Georgetown County, South Carolina. By executing this Agreement, all parties specifically consent to venue and jurisdiction in Georgetown County, South Carolina and waive any right to contest jurisdiction and venue in said Court.

43. Rights of County

The County reserves the right to reject all or any part of any bid, waive informalities and award the contract to the lowest responsive and responsible bidder to best serve the interest of the County.

44. Award of Bid

In determining the lowest responsive and responsible bidder, in addition to price, there shall be considered the following:

- (a) The ability, capacity and skill of the bidder to perform the contract.
- (b) Whether the bidder can perform the contract within the time specified, without delay of interference.

- (c) The character, integrity, reputation, judgment, experience and efficiency of the bidder.
- (d) The quality of performance on previous contracts.
- (e) The previous and existing compliance by the bidder with laws and ordinances relating to the contract.

45. Notice of Award

A *Notice of Intent to Award* will be mailed to all respondents.

46. Protest

Bidders may refer to Sections 2-67, 2-73, and 2-74 of Ordinance #20-32, also known as the Georgetown County, South Carolina Purchasing Policy to determine their remedies concerning this competitive process. The failure to be awarded a bid shall not be valid grounds for protest.

47. Debarment

By submitting a bid, the offeror certifies to the best of its knowledge and belief, that it and its principals, sub-contractors and assigns are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal, State or local department or agency. A copy of the County's debarment procedure in accordance with Section 2-68 of Ordinance #20-32, also known as the Georgetown County, South Carolina Purchasing Policy is available upon request.

48. Firm Pricing for County Acceptance

Bid price must be firm for County acceptance for 90 days from bid opening date.

49. Mobilization After Notice to Proceed

Bid must show the number of days required to mobilize after receiving a Notice to Proceed under normal conditions. Failure to state delivery time obligates bidder to complete delivery in fourteen (14) calendar days. Unrealistically short or long delivery promised may cause bid to be disregarded. Consistent failure to meet delivery promises without valid reason may be cause for removal from bid list.

50. BRAND NAME OR EQUAL:

- a) The use of a "Brand Name Only" specification is for the purpose of describing the sole item that will satisfy the county's requirements. Bids offering alternate products will be declared non-responsive.
- b) The use of a "Brand Name Or Equal" specification is for the purpose of describing the standard of quality, performance and characteristics desired and is not intended to limit or restrict competition. An item shall be considered to be substantially equivalent, or "equal" to the specified brand in the opinion of the Chief Procurement Officer, the County can reasonably anticipate sufficiently similar quality, capacity, durability, performance, utility and productivity as provided by the specified brand.
- c) The use of a "Brand Name Or Pre-Approved Equal" specification with a reference to a brand name or model number does not preclude an offer of a comparable or better product, if full specifications and descriptive literature are provided for the product. Bidder shall submit a Material Substitution Request form for a proposed equal to Purchasing by the date and time listed

in the bid solicitation to allow Owner to make a determination of equality to the brand specified. If Owner approves the proposed equal, an addendum to the bid will be issued specifically identifying the item as a pre-approved equivalent. Failure to provide such specifications and descriptive literature may be cause for rejection of the offer.

51. Environmental Management:

Vendor/Supplier/Contractor will be responsible for complying with all federal, state and local environmental regulations relating to transportation, handling, storage, spillage and any other aspect of providing the services specified herein, as applicable.

52. Bid Tabulation Results

Vendors wishing to view the bid tabulation results may visit the Georgetown County, SC web-site at: <http://www.georgetowncountysc.org>. Select “Bid Opportunities” from the Quick Links box, then “expired bids” and double click the link under the individual bid listing.

53. The Bidder hereby certifies that he or she has carefully examined all of the Documents for the project, has carefully and thoroughly reviewed this Request for Bid/Quotation, has inspected the location of the project (if applicable), and understands the nature and scope of the work to be done; and that this Bid is based upon the terms, specifications, requirements, and conditions of the Request for Bid/ Documents. The Bidder further agrees that the performance time specified is a reasonable time, having carefully considered the nature and scope of the project as aforesaid.

54. Apparent omission of a detailed description concerning any point, shall be regarded as meaning the best commercial practice is to prevail and that only material and workmanship of the finest quality are to be used.

55. Response Clarification

Georgetown County reserves the right to request additional written or oral information from Bidders in order to obtain clarification of their Responses.

56. Any attempt by the vendor to influence the opinion of County Staff or County Council by discussion, promotion, advertising, misrepresentation of the submittal or purchasing process or any procedure to promote their offer will constitute a violation of the vendor submittal conditions and will cause the vendor’s submittal to be declared null and void.

57. Substitutions and Product Options

Written requests for changes in products, materials, equipment and methods of construction required by the Contract Documents shall be submitted to the Owner prior to bidding in accordance with the timeline provided and using the Material Substitution Request form provided and in accordance with *The Project Manual, Division 1, Section 01600*.

58. Bidding Documents

a) Each Bidder shall carefully examine the Bidding and Contract Documents, General Requirements, Drawings and Technical Specifications and all addenda or other revisions and thoroughly familiarize themselves with the detailed requirements prior to submitting a Bid. Bidders shall promptly notify the Owner in writing of any ambiguity, inconsistency, error or omission, which they may discover upon examination of the Bidding and Contract Documents, Project Site and / or local conditions. The Owner shall make such interpretations, corrections or

changes to the Bidding Documents and will reply to all questions submitted by the Bidders. The Owner will log all responses and issue an addendum as may be appropriate. The Owner will not be responsible for any oral instructions and / or responses. Interpretations, corrections or changes made in any other manner will not be binding. All addenda sent to Bidders will become a part of the Bidding and Contract Documents. All inquiries shall be directed in writing or transmitted by facsimile to the office of the Owner. No allowance will be made after Bids are received due to oversight and / or error by bidder.

- b) Each Bidder shall carefully review the Table of Contents and the List of Drawings in the Project Manual to determine if any instrument is missing from the Bidding Documents. Bidders shall promptly notify the Owner, in writing, of any discrepancy.
- c) Addenda will not be mailed or faxed to all Bidders. Copies of Addenda will be made available through the County website. Prior to submitting a Bid each Bidder shall ascertain that he/she has received all Addenda issued.
- d) Owner does not assume any responsibility for errors, omissions or misinterpretations resulting from the Bidder's use of incomplete Bidding Documents.

59. Retainage

Retainage in the amount of ten percent (10%) of the value of construction costs incurred for the project, shall be withheld until the project has been completed to the satisfaction of Owner.

60. Liquidated Damages

Refer to *The Project Manual, Vol. 1, Division 1, Section 01100, Summary of Work.*

61. Allowances

A Utility Allowance is included in the contract for each roadway. See the last page of the Technical Specifications for details.

62. The contractor will be responsible for disposal of any and all removed, unused and surplus materials and any fees and transportation costs associated with the disposal.

63. The contractor is responsible for contacting the **Palmetto Utility Protection Service (P.U.P.S.)** at its **811** or toll-free number **(1-888-721-7877)** between the hours of 7:30 am (ET) and 5:30 pm (ET), Monday through Friday, 72 hours before starting the proposed work.

END OF SECTION 00100

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SECTION 00200

Intent to Respond

REF: Bid #23-002, MURRELLS INLET BIKE PATH PARKING FACILITY

If your company intends to respond to this solicitation, please complete and promptly return this form to assure that you can be included on the mailing list to receive all addenda regarding this project.

It is not necessary to return any other portion of the bid documents if you are not bidding.

Failure to return the Intent to Respond shall not be sufficient cause to rule a submittal as non-responsive; nor does the return of the form obligate an interested party to submit a response. Georgetown County's efforts to directly provide interested parties with addenda or additional information are provided as a courtesy only, and do not alleviate the respondent from their obligation to verify they have received and considered all addenda. All addenda are published and available on the county website at <http://www.gtcounty.org/> select "Bid Opportunities" from the Quick Links at the bottom of the County's main webpage.

Our firm **does** intend on responding to this solicitation.

Our firm **does not** intend on responding to this solicitation.

Company Name: _____

Address: _____

Contact Person: _____

Telephone: _____

Fax: _____

E-Mail: _____

How did you hear about this opportunity? _____

Reason if **not** responding: _____

Please return this completed form to John Bullard, Senior Buyer:

- by e-mail to JBullard@gtcounty.org
- or by Fax to (843) 545-3500.
-

[End of Intent to Respond]



MATERIAL SUBSTITUTION REQUEST

Bid #23-002, MURRELLS INLET BIKE PATH PARKING FACILITY

Date: _____

We hereby submit for your review the following PRODUCT SUBSTITUTION of the specified material for the above listed project.

Section: _____

Paragraph: _____

Specified Material: _____

Attached is complete technical data of the PRODUCT SUBSTITUTION, highlighted or underlined for easy reading, including laboratory test, as necessary, in duplicate. Included is complete information on changes to the Project Manual Documents required by the proposed PRODUCT SUBSTITUTION for its proper installation.

A) The Trade Contractor, under whose transmittal this information is sent, has reviewed the PRODUCT SUBSTITUTION and agrees it is applicable to this project in the location described and agrees to warrant/guarantee the use of the PRODUCT SUBSTITUTION in the same manner he would the Specified Product.

Yes No

If not, explain: _____

B) Does the PRODUCT SUBSTITUTION affect the dimensions shown on the Drawings in ANY WAY?

Yes No

If so, how? _____

C) Does the undersigned have the approval of the Manufacturer/Supplier to pay for any changes to the building design, including engineering and detailing costs, caused by the requested PRODUCT SUBSTITUTION?

Yes No

If so, to what extent? _____

D) What effect does the PRODUCT SUBSTITUTION acceptance have on other trades?

None Don't Know As follows:



SECTION 00300
“EXHIBIT A” - BID FORM
MANDATORY BID SUBMITTAL FORM

OFFEROR/FIRM: _____

For: **BID #23-002, MURRELLS INLET BIKE PATH PARKING FACILITY**

The undersigned, having visited the site of the Work and having familiarized themselves with local conditions affecting the design and cost of the work and with all requirements of the proposed Contract Documents, and duly issued Addenda to said documents, as acknowledged herein, propose to furnish and perform all labor, materials, necessary tools, expendable equipment, and all utility and transportation services necessary to perform and complete in a workmanlike manner all work required by said documents and Addenda.

- 1) **BASE BID PROPOSAL:** Bidder / Proposer agrees to perform all of the work described in the specifications, and shown on the drawings, for the sum of:

\$ _____ + \$30,000 Utility Allowance = \$ _____

\$ _____

Total Bid Price (Words shall govern)

- 3) ALTERNATES:
(not used)
- 4) For additional work authorized after signing the Contract, the amount of overhead and the amount of profit to be added to base costs of labor and materials shall not exceed 10% total for overhead and profit on work performed by the Contractor’s own forces and shall not exceed 15% total on work by Subcontractors.
- 5) COMPLETION DATE: Contractor must conform to Division 0, Section 00750, Summary Schedule and Key Milestones.
- 6) LIQUIDATED DAMAGES: Liquidated damages for this project shall be \$500.00 per calendar day for Contractor’s failure to complete any key milestone by its intermediate completion date or the Substantial Completion date. Refer to Division 1, Section 01100, Summary of Work.
- 7) The undersigned affirms that in making such Bid, neither he /she nor any company that they may represent, nor anyone in behalf of him / her or their company, directly or indirectly, has entered into any combination, collusion, undertaking or agreement with any other Bidder or Bidders to maintain the prices of said work, or any compact to prevent any other Bidder or Bidders from Bidding on said Contract or work and further affirms that such bid is made without regard or reference to any other Bidder or Proposer and without any agreement or understanding or combination either directly or indirectly with any other person or persons with reference to such Bidding in any way or manner whatsoever.
- 8) The undersigned, when notified of the acceptance of this Bid proposal, does hereby agree to enter into a Contract with the Owner within five (5) calendar days from the date of the Notice of Award, for the execution of the work described within the period of time allocated, and he / she shall give a Performance Bond and Payment Bond, with good and sufficient surety.

- 9) The undersigned further agrees that if awarded the Contract he /she will commence the work within ten (10) calendar days after the date of the Notice of Award and that he / she will complete the work in accordance with the Summary Schedule and Key Milestones and Substantial Completion date set forth in the Bidding and Contract Documents or such amended date as may be granted. If the undersigned fails to complete the work as provided in the aforementioned schedule, then and in that event, he / she further expressly agrees that, for each day that any phase of work under this Contract remains uncompleted thereafter the Owner may deduct from the Contract price herein specified the stipulated sum of liquidated damages as provided for herein and retain that sum for failure of the undersigned to complete this Contract on or before the expiration of the period shown in the completion schedule.
- 10) The undersigned agrees that the Owner's damages caused by delay are not capable of being established and would be difficult to measure accurately and that the sums herein specified as liquidated damages are not a penalty, but represent the parties' estimate of the actual damages which the Owner would suffer per day if the work is not completed as scheduled.
- 11) In submitting this Bid, it is understood that the right is reserved by the Owner to waive any informality or irregularity in any Bid or Bid guaranty, to reject any and all Bids, to re-Bid, to award or refrain from awarding a contract for the work and to negotiate with the apparent qualified low responsive Bidder to such extent as may be beneficial to the Owner.
- 12) The undersigned attaches hereto a cashier's check, certified check or Bid Bond in the sum five per-cent (5%) of the total base bid payable to Georgetown County, as required in the Request for Proposals, and the undersigned agrees that in case he / she fails within five (5) calendar days after Notice of Award of the Contract to him /her to enter into the Contract in writing and furnish the required Payment and Performance Bonds, with surety or sureties to be approved by Owner, and insurance policies or endorsements, the Owner may, as its option, determine that the undersigned has abandoned his / her rights and interest in such Bid and that the cashier's check, certified check, or Bid Bond accompanying his or her bid has been forfeited. Otherwise, the cashier's check, certified check, or Bid Bond shall be returned to the undersigned upon the execution of the Contract and acceptance of the bonds and insurance, or upon rejection of his / her Bid.
- 13) A Bid shall be considered unresponsive and shall be rejected if it fails to include fully executed statements or if the Bidder fails to furnish required data. When a determination has been made to award the Contract to a specific Contractor, such Contractor shall, prior to award, furnish such other pertinent information regarding his / her own employment policies and practices as well as those of his / her proposed prime contractor, subcontractors and consultants as the Owner may require.
- 14) The Bidder shall furnish similar statements executed by each of his / her prime contractor, first-tier and second-tier subcontractors and consultants whose contracts equal Ten Thousand Dollars (\$10,000.00) or more and shall obtain similar compliance by such prime contractor, subcontractors and consultants before awarding such contracts. No prime contractor or subcontract shall be awarded to any non-complying prime contractor and/or subcontractor.
- 15) It is understood and agreed that all workmanship and materials under all items of work are guaranteed for one (1) year from the date of Final Acceptance, unless otherwise specified.
- 16) The undersigned affirms that he / she has completed all of the blank spaces in the Bid Form, with an amount in words and numbers and agrees that where a discrepancy occurs between the prices quoted in words and/or in numbers the lowest figure quoted in words shall take precedence and govern when determining final costs or award of the Contract.
- 17) The undersigned affirms that wages not less than the minimum rates or wages, as predetermined for

this project by the State of South Carolina were used in the preparation of this “Bid Form”.

- 18) **REQUIRED FORMS:** There are specific forms required to be completed and submitted as part of the response to this Request for Proposals (RFP). The omission, whether inadvertent or not, of any one or more of these forms will cause the Bidder’s / Proposer’s response to be disqualified. The following forms identified as Exhibits to this RFP, shall be included in the response:

Exhibit A	Bid Form
Exhibit B	Acknowledgement of Addenda
Exhibit C	Non-Collusion Affidavit
Exhibit D	Indemnification
Exhibit E	List of Prime & Subcontractors
Exhibit F	Statement of Experience
Exhibit G	Unit Price Schedule
Exhibit H	Exceptions Page Form
Bid Bond	5% of total base bid

19) Project Mgr/NTP Contact Address: _____

20) Project Mgr/NTP Contact Person: _____

21) Telephone Number _____ Fax Number _____

22) E-Mail address _____

23) Remittance Address: _____

24) A/P Accounting Contact _____

25) Telephone Number _____ Fax Number _____

26) E-Mail address _____

27) **Suspension and Debarment**

Federal guidelines require grant recipients to obtain sufficient assurance that vendors are not suspended or debarred from participating in federal programs when contracts exceed \$25,000. By signing below you verify that no party to this agreement is excluded from receiving Federal contracts, certain subcontracts, and certain Federal financial and nonfinancial assistance and benefits, pursuant to the provisions of 31 U.S.C. 6101, note, E.O. 12549, E.O. 12689, 48 CFR 9.404, and each agency's codification of the Common Rule for Non-procurement suspension and debarment. [See <https://www.acquisition.gov/isdc-debarment-regulations> for additional information.]

- 28) If the bid is accepted, the required Contract must be executed within fifteen (15) days after receipt of written notice of formal award of Contract and Certificate of Insurance (COI) and Payment and Performance Bonds must be received.

29) Will you honor the submitted prices and terms for purchase by other departments within Georgetown County and/or by other government entities who participate in cooperative purchasing with Georgetown County, South Carolina?

Yes No

30) Acceptance of Invitation for Bid Content: The contents of the successful IFB/RFP are included as if fully reproduced herein. Therefore, the selected contractor must be prepared to be bound by his/her proposal as submitted.

31) RENEWAL OF CONTRACT

The continuation of the terms, conditions, and provisions of any resulting contract beyond the fiscal year is subject to approval and ratification by the Georgetown County Council and appropriation by them of the necessary money to fund said contract for each succeeding year.

32) CERTIFICATION REGARDING DRUG-FREE WORKPLACE:

The undersigned certifies that the vendor listed below will provide a “drug-free workplace” as that term is defined in Section 44-107-30 of the Code of Laws of South Carolina, 1976, as amended, by the complying with the requirements set forth in title 44, Chapter 107.

Yes No

33) Any attempt by the vendor to influence the opinion of County Staff or County Council by discussion, promotion, advertising, misrepresentation of the submittal or purchasing process or any procedure to promote their offer will constitute a violation of the vendor submittal conditions and will cause the vendor’s submittal to be declared null and void.

34) The lowest or any proposal will not necessarily be accepted and the County reserves the right to award any portion thereof. I/We, the undersigned, hereby confirm that all the above noted documents for Bid/Request for Proposal No. 23-002 were received.

35) MINORITY PARTICIPATION [INFORMATION ONLY]

(a) Is the bidder a South Carolina Certified Minority Business?

Yes No

(b) Is the bidder a Minority Business certified by another governmental entity?

Yes No

If so, please list the certifying governmental entity: _____

(c) Will any of the work under this contract be performed by a SC certified Minority Business as a subcontractor?

Yes No

If so, what percentage of the total value of the contract will be performed by a SC certified Minority Business as a subcontractor? _____%

(d) Will any of the work under this contract be performed by a minority business certified by another governmental entity as a subcontractor?

Yes No

If so, what percentage of the total value of the contract will be performed by a minority business certified by another governmental entity as a subcontractor?
_____ %

(e) If a certified Minority Business is participating in this contract, please indicate all categories for which the Business is certified:

- Traditional minority
- Traditional minority, but female
- Women (Caucasian females)
- Hispanic minorities
- DOT referral (Traditional minority)
- DOT referral (Caucasian female)
- Temporary certification
- SBA 8 (a) certification referral
- Other minorities (Native American, Asian, etc.)

(If more than one minority contractor will be utilized in the performance of this contract, please provide the information above for each minority business.)

36) **ILLEGAL IMMIGRATION: Non-Construction (NOV. 2008):** (An overview is available at www.procurement.sc.gov) By signing your offer, you certify that you will comply with the applicable requirements of Title 8, Chapter 14 of the South Carolina Code of Laws and agree to provide to the State upon request any documentation required to establish either: (a) that Title 8, Chapter 14 is inapplicable to you and your subcontractors or sub-subcontractors; or (b) that you and your subcontractors or sub-subcontractors are in compliance with Title 8, Chapter 14. Pursuant to Section 8-14-60, "A person who knowingly makes or files any false, fictitious, or fraudulent document, statement, or report pursuant to this chapter is guilty of a felony, and, upon conviction, must be fined within the discretion of the court or imprisoned for not more than five years, or both." You agree to include in any contracts with your subcontractors language requiring your subcontractors to (a) comply with the applicable requirements of Title 8, Chapter 14, and (b) include in their contracts with the sub-subcontractors language requiring the sub-subcontractors to comply with the applicable requirements of Title 8, Chapter 14. [07-7B097-1]

37)

INFORMATION ONLY:

Our company accepts VISA government procurement cards.

If yes, list any upcharge for P-Card Payment? _____

Our company does not accept VISA government procurement cards.

38) Printed Name of person binding bid _____

39) Signature (X) _____

40) Date _____

NOTE: THE ENTIRE IFB PACKET NEED NOT BE RETURNED. Please be sure to provide all mandatory bid submittal forms as requested. Thank you.

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“EXHIBIT B”



BID #23-002
MURRELLS INLET BIKE PATH PARKING FACILITY

ADDENDUM ACKNOWLEDGEMENT
Mandatory Submittal Form

COMPANY NAME: _____

- | | | |
|--------------------------|----------------------------------|---------------------|
| <input type="checkbox"/> | Addendum #1 Received Date: _____ | Initialed By: _____ |
| <input type="checkbox"/> | Addendum #2 Received Date: _____ | Initialed By: _____ |
| <input type="checkbox"/> | Addendum #3 Received Date: _____ | Initialed By: _____ |
| <input type="checkbox"/> | Addendum #4 Received Date: _____ | Initialed By: _____ |
| <input type="checkbox"/> | Addendum #5 Received Date: _____ | Initialed By: _____ |
| <input type="checkbox"/> | Addendum #6 Received Date: _____ | Initialed By: _____ |

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“EXHIBIT C”

**FORM OF NON-COLLUSION AFFIDAVIT OF PRIME PROPOSER / BIDDER
(Mandatory Bid Submittal Form)**

NON-COLLUSION OATH _____)

COUNTY OF: _____)

STATE OF: _____)

Before me, the Undersigned, a Notary Public, for and in the County and State aforesaid, personally appeared _____ and made oath that the Offeror Herein, his agents, servants, and/or employees, to the best of his knowledge and belief have not in any way colluded with anyone for and on behalf of the Offeror, or themselves, to obtain information that would give the Offeror an unfair advantage over others, not have they colluded with anyone for and on behalf of the Offeror, or themselves, to gain any favoritism in the award of the contract herein.

SWORN TO BEFORE ME THIS

_____ DAY OF _____, 2023

 Authorized Signature of Offeror

NOTARY PUBLIC FOR THE

STATE OF: _____

My Commission Expires: _____

Print Name: _____

Address: _____

Phone Number: _____

(Note: Notary seal required for out-of-state offeror)

“EXHIBIT D”

**INDEMNIFICATION
(Mandatory Bid Submittal Form)**

The Bidder / Proposer will indemnify and hold harmless the Owner, Georgetown County, South Carolina and their agents and employees from and against all claims, damages, losses and expenses, including attorney’s fees, arising out of or resulting from the performance of the Work provided that any such claims, damages, loss, or expense is attributable to bodily injury, sickness, disease or death, injury to or destruction of tangible property, including the loss of use resulting there from, and is caused by any negligent or willful act or omission of the Bidder / Proposer, and anyone directly or indirectly employed by him/her or anyone for whose acts any of them may be liable.

In any and all claims against the Owner, Georgetown County, South Carolina or any of their agents and / or employees by an employee of the Bidder / Proposer, and anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way to the amount or type of damages, compensation or benefits payable by or for the Bidder / Proposer under the Worker’s Compensation Acts, Disability Benefit Acts, or other employee benefit acts.

The obligation of the Bidder / Proposer under this paragraph shall not extend to the liability of Georgetown County, South Carolina or its agents and / or employees arising out of the reports, surveys, Change Orders, designs or Technical Specifications.

BIDDER / PROPOSER: _____

BY: _____

DATE: _____

TELEPHONE NO.: _____

[THE REMAINDER OF THIS PAGE IS INTENTIONALLY LEFT BLANK.]

“EXHIBIT E”

**LIST OF PRIME AND SUBCONTRACTORS
(Mandatory Bid Submittal Form)**

The undersigned states that the following is a full and complete list of proposed prime contractor and subcontractors on this Project and the class of work to be performed by each, and that such list will not be added to nor altered without the written consent of the Owner.

Prime Contractor, Subcontractor Consultants and Address	Class of Work to be Performed
1) _____ _____	_____
2) _____ _____	_____
3) _____ _____	_____
4) _____ _____	_____
5) _____ _____	_____
6) _____ _____	_____

Date: _____ **Firm Name:** _____

Signed: _____ **Title:** _____

“EXHIBIT F”

**STATEMENT OF EXPERIENCE
(Mandatory Bid Submittal Form)**

The Bidder is requested to state below what work of similar scope and complexity he/she has successfully completed, and to provide references that will enable the Owner to judge his/her experience, skill and business standing and his/her ability to conduct the Work in conformance with the requirements of the Construction Contract Documents. The County requests a minimum of three (3) references from the Primary Contractor. The Bidder may provide additional references or print additional pages as needed if they so choose.

Project and Location

Reference

1) _____

2) _____

3) _____

4) _____

5) _____

Dated: _____

Firm Name: _____

Signed: _____

Title: _____

"EXHIBIT G"

UNIT PRICE SCHEDULE
(Mandatory Bid Submittal Form)

When changes in the work are ordered by the Owner, and such changes involve the following items, the following unit prices will be used to calculate adjustments to the Contract Sum. These unit prices shall be for the Work as specified, including all labor, materials, equipment, accessories, shipping, preparation, insurance, testing, overhead, profit, applicable taxes, permits, fees, warranties and all other associated costs for the finished and completed Work. All unit prices for utility conduits shall include sweeps, bends, couplings, caps, fittings, etc. which shall be included in the unit price per linear foot. Unit prices for undercut soils shall include material in place, surveyed and compacted pursuant to the Contract Documents. Submit unit price and proposal amount for the following items. This list may not include all components necessary to provide a completed product, therefore any applicable items necessary to provide a completed product should be considered in your unit price response. In case of errors in the extension of prices, unit price governs. In case of error in summations, corrected bid amounts will be totaled and will govern. Contractor shall be responsible for all necessary electric and water hookups. Contractor shall make quantity take-offs using drawings to determine quantities to his satisfaction, reporting promptly any discrepancies which may affect bidding. This is not a comprehensive list of items included in the contract documents, and represents only a portion of the project total.

MURRELLS INLET BIKE PATH PARKING FACILITY BID TAB					
Quantities					
ITEM NO.	PAY ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
1031000	MOBILIZATION	1	LUMP SUM		
1032010	BONDS AND INSURANCE	1	LUMP SUM		
1052000	UTILITY RELOCATION	NEC	LUMP SUM	\$20,000.00	\$20,000.00
1071000	TRAFFIC CONTROL	1	LUMP SUM		
2022001	REMOVE & DISPOSE OF EXISTING CONCRETE HEADWALL	1	LUMP SUM		
2022001	REMOVE & DISPOSE OF EXISTING LANDSCAPING	1	LUMP SUM		
2025000	REMOVE & DISPOSE OF EXISTING ASPHALT PAVEMENT	12	SQ YD		
2028605	CULVERT EXTENSION PREPARATION	3	EACH		
2031200	SITE EXCAVATION	1	LUMP SUM		
2036000	GEOTEXTILE FABRIC FOR SEPARATION OF SUBGRADE & BASE	340	SQ YD		
2052000	NO. 57 STONE FOR BACKFILL (PERVIOUS CONCRETE)	120	TON		
3050106	GRADED AGGREGATE BASE COURSE - 6" UNIFORM	820	SQ YD		
3100330	HOT MIX ASPHALT BASE COURSE - TYPE C	85	TON		
4030340	MOT MIX ASPHALT SURFACE COURSE - TYPE C	70	TON		
5019020	PERVIOUS CONCRETE	2400	SQ YD		
6052110	TRUCK MOUNTED ATTENUATOR	1	EACH		
9510105	FLAT SHEET, TYPE III, FIXED SIZE	40	SF		
6271005	4" WHITE BROKEN LINE THERMOPLASTIC - 90 MIL.	300	LIN FT		
6271010	4" WHITE SOLID LINE PAVEMENT EDGE LINE THERMOPLASTIC - 90 MIL.	160	LIN FT		
7027010	DESIGN, DETAIL AND CONSTRUCT RETAINING WALL	400	SQ FT		
7141112	15" RC PIPE CULVERT - CLASS III	44	LIN FT		
7141113	18" RC PIPE CULVERT - CLASS III	293	LIN FT		
7141117	24" RC PIPE CULVERT - CLASS III	36	LIN FT		
7142532	18" RC PIPE CULVERT FLARED END SECTION - CLASS III	2	EACH		
7192030	DROP INLET (36" X 36")	5	EACH		
7192260	48" X 48" JUNCTION BOX	2	EACH		
7192285	72" X 72" JUNCTION BOX	1	EACH		
7202099	CONCRETE GUTTER-SPECIAL	760	LIN FT		
7204600	CONCRETE SIDEWALK 6" UNIFORM	30	SQ YD		
7204900	DETECTABLE WARNING MATERIAL	40	SQ FT		
7206000	CONCRETE MEDIAN	45	SQ YD		
7209000	PEDESTRIAN RAMP CONSTRUCTION	15	SQ YD		
8011300	AGGREGATE UNDERDRAIN (AGGREGATE NO. 57)	350	LIN FT		
8041025	RIP-RAP (CLASS B)	25	CU YD		
8055300	FLEXIBLE DELINEATOR POST WITH GROUND ANCHOR	17	EACH		
8100101	PERMANENT GRASSING FOR SMALL PROJECTS	0.1	ACRE		
8152007	SEDIMENT TUBES	30	LIN FT		
8153000	SILT FENCE	40	LIN FT		
	INLET PROTECTION	5	EACH		
	36" WHITE SOLID LINE CROSSWALK LINE THERMOPLASTIC - 90 MIL.	40	LIN FT		
Grand Total:					

Bidder/Proposer: _____

Signature: _____

Title: _____

Dated: _____

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“EXHIBIT H”

EXCEPTIONS PAGE

MANDATORY BID SUBMISSION FORM

List any areas where you cannot or will not comply with the specifications or terms contained within the bid documentation.

END OF SECTION 00300

SECTION 00400

BID BOND

Submit one (1) original, Power of Attorney, and Agent’s Current South Carolina license.

STATE OF _____)

COUNTY OF _____)

KNOW ALL MEN BY THESE PRESENT that we, _____

as Principal, and _____ as Surety, are

held and firmly bound unto Georgetown County, hereinafter called the Owner,

in the sum of _____ Dollars

(\$ _____) for the payment of which sum well and

to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns,

jointly and severally firmly by these presents.

WHEREAS, the Principal, on the _____ day of _____, 2023 entered into a

certain Contract with the Owner, hereto attached, for Contract entitled **Bid #23-002, MURRELLS**

INLET BIKE PATH PARKING FACILITY

NOW THEREFORE, If the Principal shall not withdraw said Bid within NINETY (90) calendar days after date of opening of the same, and shall within five (5) calendar days after the prescribed forms are presented to him/her for signature, enter into a written Contract with the Owner in accordance with the Bid as accepted, and give a Performance Bond and a Payment Bond with good and sufficient surety or sureties, as required by the Contract Documents, for the faithful performance and proper fulfillment of such Contract and for the proper payment of all persons furnishing labor or materials in connection therewith, or in the event or withdrawal of said Bid within the period specified, or in the event of failure to enter into such Contract and give such Bonds within the time specified, if the Principal shall pay the Owner the difference between the amount specified in said Bid and the amount of which the Owner may procure the required work and/or supplies, provided the latter amount be in excess of the former then the above obligations shall be void and of no effect; otherwise, to remain in full force and effect.

IN WITNESS WHEREOF, the Principal and Surety have hereunto caused this Bond to be duly executed and acknowledged by their appropriate officials as set forth below this _____ day of _____, 2023.

PRINCIPAL (If Sole Proprietor or Partnership)

(Firm Name)

ATTEST

By: _____
(SEAL)

Title (Sole Proprietor or Partner)

PRINCIPAL (If Corporation)

(Corporate Name)

By: _____
(President)

Attest: _____
(Secretary)

(Impress Corporate Seal)

COUNTERSIGNED BY
RESIDENT SOUTH CAROLINA
AGENT OF SURETY:

SURETY:

(Copy of Agent's current license
as issued by State of South Carolina
Insurance Commissioner

By: _____
Attorney-In-Fact
(Power of Attorney Must Be Attached)

(Impress Corporate Seal)

END OF SECTION 00400

**STATE OF SOUTH CAROLINA)
)
GEORGETOWN COUNTY) **CONSTRUCTION**
)
) **CONTRACT****

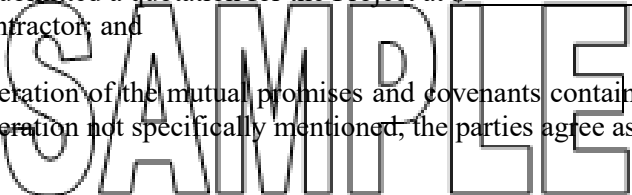
THIS CONTRACT made and entered into this _____ day of _____ 20____, by and between Georgetown County, hereinafter referred to as the “Owner”, a body politic and corporate and political subdivision of the State of South Carolina, whose administrative address is: 129 Screven Street, Georgetown, South Carolina 29440; and _____ hereinafter referred to as the “Contractor”, a corporation formed and existing under the laws of the State of South Carolina and authorized to do business within the State of South Carolina, whose administrative address is: _____



IN WITNESS WHEREOF:

WHEREAS the Owner has a project entitled _____ hereinafter referred to as the “Project”, and;

WHEREAS, the Contractor has submitted a quotation for the Project at \$ _____ and the Owner has awarded the Project to the Contractor, and



NOW, THEREFORE, in consideration of the mutual promises and covenants contained herein, as well as other good and valuable consideration not specifically mentioned, the parties agree as follows:

1. The Contractor, for and in consideration of the payments hereinafter specified and agreed to be made by the Owner, hereby covenants and agrees to furnish and deliver all materials required, to do and perform all the work and labor, in a satisfactory and workmanlike manner, required to complete the Project within the time specified, in strict and entire conformity with the Plans, Technical Specifications and other Contract documents, on file at Georgetown County, which are duly approved by the Owner and which said Plans, Specifications and other Contract documents are hereby made part of this Contract as fully and with the same effects as if the same had been set forth at length in the body of this Contract.
2. The Contractor hereby agrees to indemnify, defend and hold the Owner and, the Engineer, and each of their agents, representatives, directors, officers, and employees harmless from any and all liabilities, losses, damages, penalties, judgments, awards, claims, demands, costs, expenses, (including reasonable attorney’s fees and court costs), actions, lawsuits or other proceedings arising directly or indirectly, in whole or in part, out of the negligence or willful acts or omissions of the Contractor, Trade Subcontractors, or their respective agents, directors, officers or employees in connection with this Agreement or in any way with the services or Work described herein, any occurrence at the Project site, or any occurrence arising in connection with or at the Project site or in connection with the Work, whether within or beyond the scope of its duties hereunder.
3. The Project has been designed by _____ whose office is located at _____, and who will act as **ENGINEER** in connection with completion of the Work in accordance with the Contract Documents.

4. The project will be considered substantially complete upon completion of all items listed in the Bid Form and appurtenances in accordance with the Contract Documents, including successful performance of all testing requirements.
5. The Contractor's indemnity and defense obligations under this Contract shall be absolute notwithstanding any provision contained herein or elsewhere to the contrary, and shall survive Final Completion and Final Payment for a period equal to the statute of limitations for any action which could be brought against the Owner or its agents, officers, directors and employees and shall continue through the duration of any action brought during the applicable time periods.
6. The Contractor agrees to indemnify, defend and hold the Owner, and the Engineer, and each of their agents, representatives, officers, directors and employees, harmless from all costs, damages and expenses, including reasonable attorney's fees, incurred by the Owner and its consultants by virtue of any claim or claims filed by any Trade Subcontractor, mechanic, laborer, or materialman making claims arising from the performance of the Work by, through, or under the Contractor, provided the Contractor has received from the Owner all amounts properly due under this Contract concerning the claim. The Contractor shall execute and deliver to the Owner's title insurer similar indemnifications or such other document as such title insurer shall reasonably request in order to protect it against lien claims from Trade Subcontractors. The Contractor also hereby agrees to indemnify and hold harmless, protect and defend the Owner and its consultants from and against any liability, claim, judgment, loss or damage, including, but not limited, to direct damages, attorney's fees, court costs and expenses of collection, occasioned in whole or in part by the sole failure of the Contractor, and its Trade Subcontractors to comply with any of the terms or provisions of this Contract.
7. In any and all claims against the Owner, by any employee of the Contractor or Trade Subcontractor, anyone directly or indirectly employed by any of them, their agent or anyone for whose acts any of the Contractor or Trade Subcontractors may be liable, the indemnification obligation under this Paragraph 2 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Trade Subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.
8. The Owner hereby agrees to pay to the Contractor for the said work, when fully completed, the total sum of _____ (the said sum being the total of the Contractor's bid, a copy of which is attached hereto and, pro tanto, made a part hereof for all purposes), subject to such additions and deductions as may be provided for in the Contract Documents. In the event the bid contains multiple pay items, it is understood that the amount to be paid shall be the total based on the unit prices, together with lump sum prices, contained in said bid, for the work actually completed. Payments on accounts will be made as customarily provided by the County and consistent with applicable County procedures. The Contractor shall submit bills for fees or other compensation for services or expenses in detail sufficient for a proper pre-audit and post audit thereof. Any unit of provision of goods and services must be approved in writing by the Owner prior to payment.
9. The Owner may unilaterally cancel this Contract and the goods and services there under in the event that the Contractor fails and refuses to allow public access to all documents, papers, letters, or other material subject to the provisions of the applicable South Carolina Code of Laws, made or received by the Contractor in conjunction with this Contract.
10. This Contract has been executed by the parties prior to the rendering of any goods or services by the Contractor.
11. The Contractor shall provide a payment and performance bond (the "Bond") to the Owner meeting the requirements of applicable South Carolina Code of Laws, The Georgetown County Procurement Ordinance, as amended, and associated bid documents referenced herein, which by virtue of

executing this contract the Contractor has accepted in the sum of \$ _____ and shall cause the Bond to be recorded with the Notice of Commencement in the Public Records of Georgetown County, South Carolina.

12. This Contract shall be subordinate to any rule, regulation, order or law of the United States of America, or the State of South Carolina, respectively.
13. Contractor and its employees shall promptly observe and comply with all applicable provisions of any Federal, State and local laws, ordinances, rules or regulations which govern or apply to the goods or services rendered by Contractor hereunder including the wages paid by Contractor to its employees. Contractors shall require all of its Subcontractors to comply with the provisions of this paragraph.
14. Contractor shall procure and keep in force during the term of this contract all necessary insurance (including but not limited to general liability, casualty, workers compensation, and automobile), licenses, registrations, certificates, permits and other authorizations as are required by law in order for Contractor to render its services hereunder. Contractor shall require all of its Subcontractors to comply with the provisions of this paragraph.
15. All remedies provided in this Contract shall be deemed cumulative and additional and not in lieu of or exclusive of each other or of any other remedy available to any party at law or in equity. In the event one party shall prevail in any action (including appellate proceedings), at law or in equity arising hereunder, the losing party will pay all costs, expense, reasonable attorneys' fees and all other actual and reasonable expenses incurred in the defense and/or prosecution of any legal or arbitration proceedings, including, but not limited to, those for paralegal, investigative, legal support services and actual fees charged by expert witnesses for testimony and analysis, incurred by the prevailing party referable thereto.
16. Contractor represents and warrants unto Owner that no officer, employee or agent of Owner has any interest, either directly or indirectly, in the business or property for/on which the Contractor to conduct activities hereunder. Contractor further represents and warrants to Owner that it has not employed or retained any third party person, other than a bona fide employee working solely for Contractor, to bid, solicit or secure this Contract, that it has not paid or agreed to any person, company, corporation, individual or firm, other than a bona fide employee working solely for Contractor, any fee, commission, percentage, gift, or any other consideration contingent upon or resulting from the award or making of this Contract, and that it has not agreed, as an express or implied condition for obtaining this Contract, to employ or retain the services of any firm or person in connection with carrying out this Contract. Contractor assures that it will insert the above provision in each of its Subcontractor agreements relating to the services to be performed hereunder.
17. The headings of the sections of this Contract are for the purpose of convenience only and shall not be deemed to expand or limit the provisions contained in such sections.
18. This Contract, including all Contract documents such as, but not limited to, bid documents and procurement packages, constitutes the entire agreement between the parties and shall supersede and replace all prior agreements or understandings, written or oral, relating to the matters set forth herein.
19. This Contract shall not be amended or modified other than in writing signed by the parties hereto. Notwithstanding the foregoing, any Amendments that are not being paid for, in whole or in part, with funds granted by the United States or State of South Carolina need not be approved by them.
20. The validity, interpretation, construction and effect of this Contract shall be in accordance with and be governed by the laws of the State of South Carolina. In the event any provision hereof shall be finally

determined to be unenforceable, or invalid, such unenforceability or invalidity shall not affect the remaining provisions of this Contract which shall remain in full force and effect.

21. Termination of Contract

- a) The Owner may, by written notice, terminate this Contract in whole or in part at any time, either for the Owner's convenience or because of failure to fulfill the Contract obligations. Upon receipt of such notice, services shall be immediately discontinued (unless the notice directs otherwise) and all materials that may have been accumulated in performance of this Contract, whether completed, in transit, or in process, shall be delivered to the Owner. In such a case of termination, the contract price shall be made and remitted too include work already completed and materials already ordered however to amount shall be allowed for anticipated profit on unperformed services.
- b) If the termination is due to failure to fulfill the Contractor's obligations, the Owner may take over the work and prosecute the same to completion by contract or otherwise. In such case, the Contractor shall be liable to the Owner for any additional cost occasioned to the Owner thereby.
- c) If, after notice of termination for failure to fulfill its Contract obligations, it is determined that the Contractor had not failed, the termination shall be deemed to have been effected for the convenience of the Owner. In such event, adjustment in the Contract price shall be made as provided in paragraph 21.a of this clause.
- d) The rights and remedies of the Owner provided in this clause are in addition to any other rights and remedies provided by law or under this Contract.
- e) Non-Appropriation:
It is understood and agreed by the parties that in the event funds are not appropriated in the current fiscal year or any subsequent fiscal years, this contract will become null and void and the County will only be required to pay for services completed to the satisfaction of the County.

22. Waiver or Forbearance

Any delay or failure of County to insist upon strict performance of any obligation under this Agreement or to exercise any right or remedy provided under this Agreement shall not be a waiver of County's right to demand strict compliance, irrespective of the number or duration of any delay(s) or failure(s). No term or condition imposed on Contractor under this Agreement shall be waived and no breach by Contractor shall be excused unless that waiver or excuse of a breach has been put in writing and signed by both parties. No waiver in any instance of any right or remedy shall constitute waiver of any other right or remedy under this Agreement. No consent to or forbearance of any breach or substandard performance of any obligation under this Agreement shall constitute consent to modification or reduction of the other obligations or forbearance of any other breach.

23. Title VI Compliance:

Georgetown County hereby gives public notice that it is the policy of the agency to assure full compliance with Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, Executive Order 12898 on Environmental Justice, and related statutes and regulations in all programs and activities. Title VI requires that no person in the United States of America shall, on the grounds of race, color, or national origin, be excluded from the participation in, be denied the benefits of, or be otherwise subjected to discrimination under

any program or activity for which Georgetown County receives federal financial assistance. Any person who believes they have been aggrieved by an unlawful discriminatory practice under Title VI has a right to file a formal complaint with Georgetown County. Any such complaint must be in writing and filed with Georgetown County's Title VI Coordinator within one hundred and eighty (180) days following the date of the alleged discriminatory occurrence. For more information, or to obtain a Title VI Discriminatory Complaint Form, please see our website at <http://www.gtcounty.org>.

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SAMPLE

IN WITNESS WHEREOF, the Owner and Contractor hereto have signed and sealed this Contract on the day and date first above written. To facilitate execution, this Agreement may be executed, including electronically, in as many counterparts as may be required. It shall not be necessary that the signature on behalf of both parties hereto appear on each counterpart hereof. All counterparts hereof shall collectively constitute a single agreement.

Georgetown County, South Carolina

Witness:

By: _____

Louis Morant
Georgetown County Council Chair

[Company Name]

By: _____

(Title)

Attest:

SAMPLE

SECTION 00600

PERFORMANCE BOND

BOND NO. _____

KNOW ALL MEN BY THESE PRESENTS that we, _____ as Principal, and _____ as Surety, are held and firmly bound unto Georgetown County, South Carolina hereinafter called the Obligee, in the Penal sum of _____ Dollars (\$ _____) for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally firmly by these presents.

WHEREAS, the Principal, on the _____ day of _____, 2023 entered into a certain Contract with the Owner, included herein, for the Contract entitled **Bid #23-002, MURRELLS INLET BIKE PATH PARKING FACILITY.**

NOW THEREFORE, the condition of this obligation is such that if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said Contract, and all duly authorized modifications of said Contract that may hereafter be made, notice of which modifications to the Surety being hereby waived, then this obligation shall be void; otherwise, to remain in full force and effect.

Whenever the Principal shall be and is declared by the Owner to be in default under the Contract, or wherever the contract has been terminated by default of the Contractor, the Owner having performed the Owner's obligations hereunder, the Surety shall:

1. Complete the Contract in accordance with its terms and conditions, or at the Owner's sole option.
2. Obtain a Bid or Bids for submission to the Owner for completing the Contract in accordance with its terms and conditions, and upon determination by the Owner and Surety of the lowest responsible Bidder, arrange for a Contract between such Bidder and the Owner, and made available as work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost completion less the balance of the Contract price but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term balance of the Contract price: as used in this paragraph, shall mean the total amount payable by the Owner to the Contractor under the Contract and any amendments thereto, less the amount properly paid by the Owner to the Contractor.

No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Owner named herein or the successors or assignees thereof.

In the case of termination of the Contract, as provided in the Contract Documents, there shall be assessed against the Principal and Surety herein, all expenses, including design/engineering, geo-technical, surveying, and legal services incidental to collecting losses to the Owner under this Bond.

This Bond shall remain in full force and effect for such period or periods of time after the date of acceptance of the project by the Owner as are provided for in the Contract Documents, and the Principal hereby guarantees to repair or replace for the said periods all work performed and materials and equipment furnished, which were not performed or furnished according to the terms of the Contract Documents. If no specific periods of warranty are stated in the Contract Documents for any particular item of work, material, or equipment, the Principal hereby guarantees the same for a minimum period of one (1) year from the date of final acceptance by the Owner.

The Surety shall permit arbitration and be ultimately responsible for the payment of any award.

IN WITNESS WHEREOF, the above bounden parties have caused this Bond to be signed and sealed by their appropriate officials as of the _____ day of _____, 2023.

PRINCIPAL

(Firm Name)

By: _____
(Title)

WITNESS

SURETY

(Firm Name)

By: _____
(Title)

WITNESS

END OF SECTION 00600

SECTION 00601

LABOR AND MATERIAL PAYMENT BOND

BOND NO. _____

KNOW ALL MEN BY THESE PRESENTS that we, _____ as
Principal, and _____ as Surety, are held and firmly
bound unto Georgetown County, South Carolina hereinafter called the Obligee, in the Penal sum of
_____ Dollars
(\$ _____) for the payment of which sum well and truly to be made, we
bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally firmly by these
presents.

WHEREAS, the Principal, on the ____ day of _____, 2023 entered into a certain Contract with the
Owner, included herein, for Contract entitled **Bid #23-002, MURRELLS INLET BIKE PATH PARKING
FACILITY.**

NOW THEREFORE, the condition of this obligation is such that if the Principal shall promptly make payments to
all persons supplying labor, materials and supplies used directly or indirectly by said Principal or his
Subcontractors in the prosecution of the work provided for in said Contract, then this obligations shall be void;
otherwise to remain in full force and effect, subject, however, to the following conditions:

1. This bond is executed for the purpose of complying with the applicable State of South Carolina Statutes and
all acts amendatory thereof, and this Bond shall inure to the benefit of any and all persons supplying labor,
material and supplies used directly or indirectly by the Principal or his Subcontractors in the prosecution of the
work provided for in said Contract so as to give such persons a right of action to recover upon this Bond in a
separate suit brought on this Bond. No right of action shall accrue hereunder to or for the use of any person
except as such right of action may be given and limited by the applicable State of South Carolina Statutes.
2. In each and every suit brought against the Principal and Surety upon this Bond in which the plaintiff shall be
successful, there shall be assessed therein against the Principal and Surety herein, in favor of the Plaintiff therein,
reasonable counsel fees, which the Principal and Surety hereby expressly agree to pay as a part of the cost and
expense of said suit.
3. A claimant, except a laborer, who is not in privity with the Principal and who has not received payment for his
labor, materials, or supplies, shall, within forty-five (45) calendar days after beginning to furnish labor, materials,
or supplies for the prosecution of the work, furnish the Principal with a notice that he intends to look to the bond
for protection.
4. A claimant who is not in privity with the Principal and who has not received payment for his labor, materials or
supplies shall, within ninety (90) calendar days after performance of the labor or after complete delivery of the
materials or supplies, deliver to the Principal and to the Surety written notice of the performance of the labor or
delivery of the materials or supplies and of the non-payment.

5. No action for the labor, materials, or supplies may be instituted against the Principal or the Surety unless both notices have been given. No action shall be instituted against the Principal or the Surety on the bond after one (1) year from the performance of the labor or completion of delivery of the materials or supplies.

The Surety shall permit arbitration and be ultimately responsible for the payment of any award.

IN WITNESS WHEREOF, the above bounden parties have caused this Bond to be signed and sealed by their appropriate officials as of the _____ day of _____, 2023.

PRINCIPAL

(Firm Name)

By: _____
(Title)

(Witness)

SURETY

(Firm Name)

By: _____
(Title)

(Witness)

END SECTION 00601

SECTION 00750

SUMMARY SCHEDULE AND KEY MILESTONES

1.0 GENERAL

1.01 THIS SECTION INCLUDES

- A. Summary Submittals
- B. Key Milestones
- C. Base Bid Summary Schedule
- D. Alternate Summary Schedule (If Applicable)

1.02 SUMMARY SCHEDULE

- A. Summary Schedules referred to in this section will be developed by the Contractor and the Owner illustrating an approach to designing and constructing the project. The activities to be shown on the schedules will be monitored and updated.
- B. Milestones shown on the Summary Schedules will be “Key Milestones” and are to be included in the Contractor’s Contract Schedule. The Contractor is responsible to develop his/her own activities and logic to meet the required Key Milestone Intermediate Dates. Refer to Division 1, Section 01310, Project Management and Coordination.

1.03 KEY MILESTONES

- A. Key Milestones shall be included in all Contractor Schedules and show completing on the intermediate dates shown in this Section.
- B. Key Milestones are a contractual requirement and liquidated damages as specified in *The Project Manual, Vol. 1, Division 1, Section 01100, Summary of Work*, will be assessed for each Key Milestone that completes beyond the dates listed below. Refer to Division 1, Section 01100 and Summary of Work.
- C. Key Milestones for the Base Bid are as follows:

Milestone: *Substantial Completion*

Date: 200 Days from NTP

Milestone: *Final Completion*

Date: 230 Days from NTP

END OF SECTION 00750

SECTION 00800

SPECIAL PROJECT CONDITIONS

1.0 PURPOSE

The Special Project Conditions are intended to identify those elements of work and items of material, and responsibilities of the Contractor, which are unique to the project and required by the Contract Documents. They are intended to supplement those contractual requirements contained within the Contract Documents including, but not limited to: the Contract; Division 1, General Requirements, Drawings and Technical Specifications.

2.0 SAFETY AND SECURITY

2.0.1 ENTRY ONTO THE PROJECT SITE

The Contractor shall be responsible for the security of all materials and equipment to be used for the Work of the Project. Vehicles to be allowed on the Project site will include only those of the Contractor, prime and sub-contractors and those designated by the Owner. Contractor shall have sole responsibility for the safety of vehicles in close vicinity and within the projects Limits of Disturbance.

2.0.2 STORAGE / STAGING AREA

All construction material, either the Contractor's, prime and sub-contractor's vehicles and equipment, and personal vehicle parking areas will be established and regulated by the Contractor and approved by the Owner. Staging and storage areas will not be provided by the Owner. Coordination of deliveries and storage will be determined during the pre-construction conference.

2.0.3 OPEN TRENCHES

All open trenches and excavations within the project site shall be marked per the requirements of MUCTD and any referenced Standard Drawings for Traffic Control.

2.0.4 SECURITY

The Contractor shall be responsible for the security of his/her equipment and materials, as well as the security of the equipment and materials of his agents prime and sub-contractors. Further, he/her shall be responsible for the security of all gates and entrances to the Project site. The gates shall be locked at all times, or guards posted at the gates to control ingress and egress through them. The Contractor shall provide adequate lighting for the entire area of the Project site.

The Contractor shall provide to Owner a list of all his/her employees as well as a list of all the employees of the prime and sub-contractors and shall, during the work of the Project, advise the Owner of changes to the list of personnel working on the Project. The Contractor shall be responsible for the direct supervision of his/her employees, those of his agents, prime and sub-contractors at all times while on the Project site.

The Contractor shall exercise and take all precautions in the storage and dispensing of all flammable liquids such as, but not limited to, gasoline, diesel fuel and lubricants.

3.0 SURFACE INFORMATION AND MATERIALS INSPECTION

The Contractor shall have full responsibility for acquisition, interpretation, analysis and cost impact of sub-surface conditions in the performance of the Work required by this contract. The Contractor shall provide, to the Owner, written certification that all materials and equipment meet the design requirements, established in the drawings and technical specifications for permitting and are in conformance with the Construction Documents. Copies of all test, inspection and certification reports shall be submitted to the Owner within twenty-four (24) hours of receipt of such reports by the Contractor.

4.0 PAVEMENT

The Contractor shall be responsible for all roadways adjacent to or on the project site over which his, his agents prime and / or sub-contractors vehicles may travel. The Contractor shall at his sole cost

and expense, repair any damage caused by operation of equipment or hauling of debris on any and all roads off of the project site used to travel on.

5.0 PROJECT SIGN

N/A

6.0 PROJECT PROGRESS PHOTOGRAPHS

N/A

7.0 LANDSCAPING AND TREES

The contractor shall be responsible for all landscaping and / or trees damaged due to negligence incurred by his / her operations.

PART 2- PRODUCTS

Not Used

PART 3- EXECUTION

Not Used

END OF SECTION 00800

SECTION 00900

LIST OF DRAWINGS & TECHNICAL SPECIFICATIONS

Bid #23-002, MURRELLS INLET BIKE PATH PARKING FACILITY

I - LIST OF DRAWINGS:

<u>SHEET NO.</u>	<u>DESCRIPTION</u>	<u>SHEET TOTALS</u>
G1.01	Title	1
G1.02	Construction Notes & Legend	1
C1.01	Existing Conditions & Demolition Plan	1
C2.01	Sediment & Erosion Control Plan – Phase 1&2	1
C2.02	Sediment & Erosion Control Plan – Phase 3	1
C2.03	Sediment and Erosion Control Details	1
C3.01	Horizontal Control Plan	1
C4.01	Grading & Drainage Plan	1
C4.02	Drainage Profiles	1
C4.03	Site Details	1
C5.01	Traffic Control Plan	1

Plans and Drawings should be plotted on a 24” x 36” with NO SCALE, print at 1 to 1 scale.

II - LIST OF ADDITIONAL ATTACHMENTS:

TITLE

PERMITS

END OF SECTION 00900

SECTION 01100 SUMMARY OF WORK

PART 1-GENERAL

The Summary of Work in this Section comprises the **MURRELLS INLET BIKE PATH PARKING FACILITY** project in Georgetown County, South Carolina. The following scope of work description is intended to be general in nature. The intention is to have the successful Contractor perform all of the work included and presented within the Contract Documents, paying particular attention to the Summary Schedule, Key Milestones in Division 0, Section 00750. The Contractor shall comply with and be responsible for all of the requirements of the Project Manual. The Drawings and Technical Specifications are not intended to indicate or describe all work, or means and method of construction required for completion of the Work. The Contractor shall provide and install all incidentals that are required for completion of the Work.

The Work Consists Of: clearing and grubbing within project limits, removing retaining wall, locate all utilities including telecom, coordinate the re-location of required telecom and power utilities, coordinate and re-locate required water and sewer lines, design and construct approved keystone retaining knee wall, installing and connecting approx. 329' of 18" RC and approx. 44' of 15" RC storm drainage pipe, associated catch basins, connection box's and materials to comply with local and SCDOT standards and testing. Placing base course and pervious concrete for 9' X 24' (typ) 13 parking spots, 12' (typ) base and asphalt pavement thru lane centerline approx. 478 LF, raised concrete islands, paving markings and signage to comply with local and SCDOT standards and testing. Project located between Georgetown County Water and Sewer pump Station and Pinnacle Drive parallel with Business Highway 17 Murrells Inlet, SC.

1.01 RELATED REQUIREMENTS INCLUDED

- A. Project Manual, Division 0, Bidding and Contract Documents
- B. Project Manual, Division 1, General Requirements
- C. The Contractor shall comply with and be responsible for all of the requirements of the Project Manual, without exception.
- D. The Contract Form for this Project shall be as stipulated in Division 0, Section 00500 in the Project Manual.

1.02 SCOPE OF WORK AND USE OF THE PREMISES

- A. Contractor shall have use of the Project Site as shown on the applicable Drawings for execution of the Work of this Contract, except as may be otherwise indicated or necessitated by the requirements of the Project Manual, or as may be determined by the Owner.
- B. Contractor shall provide, or cause to be provided, and shall pay for all testing, labor, equipment, materials and such other utilities, transportation and facilities necessary for the proper execution of the Work, whether temporary or permanent, and whether or not incorporated or to be incorporated in the Work.
- C. Construction services shall be performed by qualified, licensed construction contractors and suppliers selected and paid by the Contractor.
- D. Contractor shall provide protection at all affected areas of the site during the performance of the Work.
- E. Contractor shall perform all work in conformance with O.S.H.A. requirements, which will be strictly enforced.
- F. Contractor shall coordinate the use of the premises consistent with the Project requirements as may be directed by the Owner.
- G. Contractor shall use access routes for delivery of materials and equipment only as indicated on the drawings approved by the Owner and as may be directed by the Owner. Do not use access routes other than those indicated. Contractor shall keep clean, maintain and repair all access routes used.
- H. Electrical power will not be provided for welding or any other equipment.

- I. Contractor shall assume full responsibility for the protection and safekeeping of all products under this contract, stored and / or installed on the Project Site as well as those products stored off the Project Site. Materials, products and equipment shall be stored on the Project Site only in those areas indicated or allowed for staging and approved by the Owner.
- J. Safe staging and material storage shall be limited to the area indicated on the drawings, which have been approved by the Owner and as may be designated by the Owner. Contractor must obtain specific permission from the Owner for the use of other areas for storage and staging.
- K. Contractor shall protect existing sidewalks, pavement, curbs, utilities, building exterior and interior surfaces subject to damage by Work performed under this contract. Contractor shall, at his sole cost and expense, repair or replace any existing work damaged by his/her prime and/or sub-contractor's personnel or equipment.

1.03 WORK SEQUENCE AND COMPLETION

- A. Contractor shall work in an orderly manner coordinated with the work of other disciplines and trades.
- B. No disruption to, or use of adjacent facilities and access to those facilities will be allowed.
- C. The Owner may require certain work to be performed after normal working hours or on holidays or weekends or as may be necessitated in the Public interest. Such work does not constitute a change of scope or additional cost.
- D. Contractor shall perform the Work in conformance with the Summary Schedule and Key Milestones in Section 00750. This Section includes critical interim completion dates that the Contractor is required to meet.

1.04 LIQUIDATED DAMAGES

The Contractor agrees to commence Work under this Contract on the effective date established as "Notice to Proceed", and to complete the Work in conformance with the established Summary Schedule and Key Milestones in Section 00750 of the Project Manual. Should the Contractor neglect, fail or refuse to complete the Work by any one of the key milestone activities by its critical interim completion date(s) or the Substantial Completion date then the Contractor shall pay to the Owner Liquidated Damages in the amount of **\$500.00** per calendar day for those damages suffered by the Owner as a result of delay for each and every calendar day that the Contractor has failed to complete any key milestone activity by its interim completion date or the Substantial Completion date. The aforementioned Liquidated Damages are not a penalty, but rather are a pre-agreed liquidation of the losses incurred by the Owner due to failure of the Contractor to complete the Work on time.

1.05 SUBSTITUTIONS AND PRODUCT OPTIONS

Refer to Division I, Section 01600, Product Requirements in the Project Manual.

1.06 SURVEY

Contractor shall verify all survey data, Geotechnical reports and Dilatometer investigations included within the Contract Documents and report any errors and inconsistencies in writing to the Owner before any work is performed in those areas where errors and inconsistencies may exist. Refer to Division 1, Section 01310, Project Management and Coordination in the Project Manual.

PART 2- PRODUCTS

Not Used

PART 3- EXECUTION

Not Used

END OF SECTION 01100

SECTION 01290

PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- A. Division 0, Bidding and Contract Documents of the Project Manual.
- B. Division 1, General Requirements of the Project Manual

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements governing the Contractor's Certified Applications for Payment.
- B. This Section requires the coordination of the Contractor's Applications for Payment with the Construction Schedule, including established Key-Milestone Dates, Schedule of Values, Submittal Schedule, Prime and Sub-Contractors work.

1.3 APPLICATION FOR PAYMENT

A. General

1. Progress payments shall be applied for and made as the construction of the Work proceeds at intervals stated in the Contract. The Contractor will provide, to the Owner a "draft" copy of his/her Application for Payment on the 25th day of the month, or the closest workday should the 25th day fall on a weekend or holiday. This provides an opportunity to discuss figures (Schedule of Values) before they become "fixed", and will expedite the processing of the final typed Application when the Owner receives it.
2. Formal Applications for Payment shall be submitted to the Owner by close of business on the 1st day of the succeeding month, or the closest work day should the 1st day fall on a weekend or holiday of the month. The Certified Application for Payment will be processed, by the Owner, thirty (30) calendar days from the day that the Contractor submits the final Application for Payment, except if that day should fall on a weekend or holiday in which case payment shall be made on the next succeeding work day.
3. All information required on the Application shall be provided and filled in, including that for Change Orders executed prior to the date of submittal of the Application. Summary of dollar values must agree with respective totals indicated on continuation sheets.
4. Each Certified Application for Payment shall be consistent with previous Applications as approved by and paid for by the Owner.
5. All Work covered by Progress Payments shall, at the time of payment, become the property of the Owner.
6. Form of Application for Payment will be AIA Document G 702 revised, and Continuation Sheets G 703.
7. All formal Applications for Payment shall be submitted in duplicate to the Owner by means ensuring receipt within twenty-four (24) hours. Itemized Applications and supporting documents shall be submitted with a complete transmittal form listing attachments, and recording appropriate information related to the Application in a manner acceptable to the Owner. Itemized data and

format provided on continuation sheets shall include schedules, line items, values as stipulated in the Schedule of Values as accepted by the Owner.

8. With each Application for Payment the Contractor shall certify that such Application for Payment represents a just estimate of costs reimbursable to Contractor under terms of the Contract and shall certify there are no Mechanic's or Materialmen's Liens outstanding at the date of that Application for Payment, that all due and payable bills with respect to the Work have been paid to date or shall be paid from the proceeds of that Application for Payment, that there is no known basis for the filing of any Mechanic's or Materialmen's Lien against the Surety in connection with the Work, that Waivers and Bills Paid Affidavit forms from all prime and subcontractors, consultants and materialmen have been, or will be, obtained in the form agreeable to the Owner and that amount of the contract remaining to be expended is sufficient to complete the project.
9. The Contractor shall complete each entry on the forms, including notarization and execution by a person authorized to sign legal documents on behalf of the Contractor. Incomplete Applications for Payment will be returned without action.
10. Conditions governing regular schedule for applications, payment and retainage shall be as stated in the Contract.
11. Continuation sheets shall include a total list of all scheduled component items of work with item number and scheduled dollar value for each item. Dollar values to be included in each column for each scheduled line item when Work has been performed or products stored. Round off values to nearest dollar or as may be specified for Schedule of Values.
12. List each Change Order executed prior to date of submission at end of continuation sheets. List by Change Order number and description as to original component item of Work.

B. Waivers and Mechanics Liens

1. Monthly Applications for Payment shall include Waivers of Mechanic's Liens and Claims for all Work included in the period of construction covered by the Application for Payment and the previous month's Application. Waivers of Liens and Claims from prime contractors or subcontractors and suppliers shall include the period of construction covered by the Application for Payment, the total amount paid prior to and including the previous month's Application
2. Partial Waivers of Liens shall be submitted on each item of work for the amount requested, prior to deduction for retainage, for each item.
3. Contractor shall submit final or full Waivers of Liens and Claims for completed items of work shown on the monthly Application for Payment.
4. The Owner reserves the right to designate which entities involved in the Work must submit Waivers of Liens.
5. The Contractor's final Application for Payment shall be submitted with, or preceded by final Waivers from every entity involved with the performance of work, supplying of materials or the providing of professional services covered by the Application who could lawfully be entitled to a Lien.
6. Waivers of Liens shall be provided on forms, and executed in a manner acceptable to the Owner.

C. Initial (First) Monthly Application for Payment

1. Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include, but are not limited to the following:
 - a. List of all prime contractors, first and second tier subcontractors.
 - b. Contractor's Sworn Statement of principal suppliers, fabricators, prime and subcontractors.
 - c. Schedule of Values.
 - d. Contractor's construction schedule, to be updated monthly.
 - e. Schedule of principal products and long lead delivery items, to be updated monthly.
 - f. Submittal Schedule, Procurement Schedule.
 - g. Copies of all required permits.
 - h. Copies of authorizations and licenses from governing authorities for performance of work.
 - i. Initial progress report.
 - j. Certificates of Insurance and insurance policies.
 - k. Any material stored off site must carry additional insurance (All Risk Rider) stating Owner as insured. All material will be inspected by the Owner before billing can be approved. Bill of Sale and receipts for items being billed at cost only are required and 25% retainage will be held for off-site stored materials. Paperwork must accompany request two weeks prior to billing to insure adequate time to schedule Owner's inspection.
 - l. Contractor's Construction Safety Plan (Initial Only).

D. Application for Payment at Substantial Completion

1. The Contractor shall, upon issuance of the Certificate of Substantial Completion, submit his/her Application for payment, which shall reflect any Certificates of Substantial Completion issued previously for Owner occupancy for designated portions of the Work.
2. Application shall include, but not be limited to and as may be determined by the Owner, the following:
 - a. Certificates of Occupancy and such other permits and approvals as may be required.
 - b. Warranties (Guarantees) and maintenance agreements as may be applicable.
 - c. Testing, adjusting and balance records.
 - d. Maintenance manuals, training and instructions.
 - e. Equipment start-up performance reports.
 - f. Changeover information related to Owner's occupancy, use, operation and maintenance.
 - g. Final cleaning of the entire project site..
 - h. Application for Reduction of Retainage, and Consent of Surety.
 - i. List of incomplete Work, recognized as exceptions to issuance of Certificate of Substantial Completion.

E. Final Application for Payment

1. Administrative actions and submittals that shall precede or coincide with this final Application for Payment shall include, but not be limited to and as may be determined by the Owner, the following:
 - a. Completion of Project Closeout requirements.
 - b. Completion of items specified for completion after Substantial Completion.
 - c. Prepare and submit to the Owner a list of unsettled claims, as may be applicable.
 - d. Transmit to the Owner all required project records including permit drawings, as constructed drawings both on hard copy and in electronic (PDF) format.
 - e. Provide to the Owner evidence that all requisite taxes, fees and similar obligations have been paid in full.
 - f. Removal of all temporary facilities and services.

- g. Removal of all surplus materials, rubbish and similar elements.

PART 2 - PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01290

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SECTION 01300

REGULATORY REQUIREMENTS

PART 1 – GENERAL

1.01 RELATED REQUIREMENTS

- A. Division 0, Bidding and Contract Documents of the Project Manual
- B. Division 1, General Requirements of the Project Manual

1.02 CODES, AUTHORITIES, REGULATORY AGENCIES, AND INDUSTRY REFERENCES

- A. Where references are made on the Drawings or in the Technical Specifications to codes, they shall be considered an integral part of the Contract Documents as minimum standards. Nothing contained in the Contract Documents shall be so construed as to be in conflict with any law, bylaw or regulation of the municipal, state, federal or other authorities having jurisdiction.
- B. Perform Work in compliance with the following code:
 - 1. Current edition of all applicable building code(s), local, state and federal.
- C. Perform Work in compliance with the following Authorities and Regulatory Agencies:
 - 1. Georgetown County, South Carolina
 - 2. South Carolina Dept. of Natural Resources (SCDNR)
 - 3. South Carolina Dept. of Transportation (SCDOT)
 - 4. South Carolina Department of Health Environmental Controls (SCDHEC/OCRM)
 - 5. OSHA Code of Federal Regulations. (OSHA)
 - 6. All federal, state and local clean air, clean water, water rights, resource recovery, and solid waste disposal standards and the Federal Endangered Species Act, and the Occupational Safety and Health Acts.
 - 7. Environmental Protection Agency (EPA).
- D. Perform Work in compliance with the following industry references:
 - 1. National Fire Protection Association (NFPA), National Electric Code (NEC).
 - 2. NFPA 101, Life Safety Code.
 - 3. SCE 7-88: Minimum Design Loads for Buildings and Other Structures.
 - 4. American Society for Testing and Materials (ASTM).
 - 5. Underwriters Laboratories (UL).
 - 6. The National Board of Fire Underwriters.

1.03 FIRE RATINGS

- A. Where material, component, or assembly is required to be fire rated, fire rating shall be determined or listed by the following testing agency:
 - 1. Factory Mutual Laboratories (FM).
- B. Equivalent fire rating as determined or listed by another testing authority is acceptable if approved by applicable governing authorities having jurisdiction in and for Georgetown County, South Carolina.

1.04 PERMITTING

- A. At no additional expense to the Owner, file for and obtain necessary licenses and permits for any interim phases for construction, and be responsible for complying with any Federal, State, County, and Municipal Laws, Codes, regulations applicable to the performance of the Work, including, but not limited to, any laws or regulations requiring the use of licensed prime and /or subcontractors to perform parts of the Work.

1.05 INSPECTION AND CERTIFICATIONS

- A. Arrange inspection and obtain Certificates of approval from applicable authorities having jurisdiction. Furnish Certificates of Approval in accordance with the applicable Technical Specifications and the General Requirements of the Contract.
- B. Notify and coordinate for all appropriate Georgetown County and State inspections of the work. Allow enough time to maintain progress of the work.

1.06 PERFORMANCE

- A. Should the Contractor knowingly perform any Work that does not conform with the requirements of applicable codes, ordinances, regulations, or standards, without given prior written notice to the Owner and obtaining required variance, etc. from the governing body, Contractor shall assume full responsibility thereof and shall bear all costs involved in correcting such non-complying Work. Costs shall include but not be limited to: All fines, inspection costs, damages, design and management fees in addition to the cost of removal and replacement of the work of all trades involved.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01300

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SECTION 01310

PROJECT MANAGEMENT AND COORDINATION

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall comply with and be responsible for all of the requirements of the Project Manual and the Construction Contract Documents, without exception
- B. The Contractor shall be responsible for general project coordination of all construction phases and aspects, trades and disciplines of the Work of the Project.
- C. The Contractor shall be responsible for general coordination of all construction site operations with other improvement projects that may be conducted by the Owner.
- D. The Contractor shall be responsible for general coordination with other interested parties including, but not limited to, Dennis Corporation, Owner, other Contractors working on Owner or abutter property projects, and all involved permitting authorities.

1.02 RELATED REQUIREMENTS

- A. Division 0, Bidding and Contract Documents in the Project Manual.
- B. Division 1, General Requirements in the Project Manual

1.03 GENERAL COORDINATION

- A. Coordinate scheduling, submittals, and work of various Sections of the Technical Specifications to assure efficient and orderly sequence of installation of construction elements with provisions for accommodating items furnished by the Owner, or others, to be installed by the Contractor.
- B. Coordinate sequence of Work to accommodate partial occupancy for the Owner as specified in Section 01100, Summary of Work and / or as directed by the Owner.
- C. Review and coordinate requirements of all Divisions of the Project Manual and Sections of the Technical Specifications. Report any discrepancies to the Owner
- D. Maintain services of prime and major sub-contractors throughout duration of the Contract, except as may be required by provisions of Conditions of Contract. Notify the Owner, in writing, of intention to replace prime or sub-contractor(s), outlining reasons for the action and naming proposed replacement contractor(s).
- E. Coordinate work of prime and sub-contractors and record contractor installation(s) data on Project Record Drawings.
- F. All communications regarding Contract requirements shall be addressed to the Owner. Outline any special procedures required for coordination and include such items as required notices, reports and attendance at meetings.
- G. Arbitrate and resolve coordination conflicts between prime and sub-contractors to ensure complete and operational systems.

- H. Coordinate work with all existing utility systems.
- I. Coordinate construction activities to ensure that operations are carried out with due consideration given to energy, water and materials.
- J. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work.

1.04 COORDINATION MEETINGS

- A. In addition to the meetings referred to in Section 01315, Progress Meetings, the Contractor shall conduct coordination meetings and pre-installation meetings with supervisory personnel, prime and sub-contractors, suppliers, the Owner and others as necessary and applicable to assure coordination of different trades and disciplines
- B. Schedule coordination and pre-installation meetings with prime and sub-contractors, suppliers and the Owner to discuss hardware installation and specialty systems installation as may be applicable.

1.05 COORDINATION OF SUBMITTALS

- A. Coordinate use of Project space and sequence of installation of equipment, walks, parking areas, mechanical, electrical, plumbing, or other Work that is indicated diagrammatically on the Drawings and/or contained in the Technical Specifications. Utilize space efficiently to maximize accessibility for Owner installations, maintenance and repairs.
- B. In finished areas, except as otherwise shown, conceal ducts, pipes, wiring, and other non-finish items within construction. Coordinate locations of concealed items with finish elements, and provide as-constructed drawings of the involved location.
- C. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in sequence required to obtain best results.
- D. Make adequate provisions to accommodate items scheduled for later installation, including accepted Bid Alternates, Owner supplied items, sub-subcontractor installed items, work by others, and installation of products purchased with allowances.

1.06 COORDINATION OF MECHANICAL, ELECTRICAL, AND OTHER INSTALLATIONS

- A. General: Sequence, coordinate, and integrate the various elements of mechanical, electrical, and other systems, materials, and equipment. Comply with the following requirements:
 - 1. Coordinate mechanical and electrical systems, equipment and materials installation with other building components.
 - 2. Verify all dimensions by field measurements, and advise the Owner of any dimensional conflicts.
 - 3. Arrange and coordinate for chases, slots, and openings in other building components during progress of construction.
 - 4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, prior to placement of concrete and/or other structural components.

5. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible and advise the Owner prior to completion of such installations.
6. Coordinate connection of systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchise service (utility) companies, and controlling agencies. Coordinate and provide required connection for each service.
7. Install systems, materials, and equipment to confirm with approved submittal data, include coordination drawings. Confirm to arrangements indicated by the Contract Documents, recognizing that portions of the Work may be shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, immediately refer conflict to the Owner
8. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components. Elements restricting such installation will be referred to the Owner
9. Install systems, materials, and equipment to facilitate servicing, maintenance, and repair or replacement of disconnecting, with minimum of interference with other locations and ease of access.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used.

END OF SECTION 01310

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SECTION 01315

PROGRESS MEETINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Division 0, Bidding and Contract Documents apply to this Section.
- B. Division 1, General Requirements of the Contract Documents apply to this Section.

1.2 SUMMARY

- . This Section specifies administrative and procedural requirements for all project meetings including but not limited to the following:
 - 1. Field / Site Coordination Meetings.
 - 2. Construction Progress Meetings.
 - 3. Project Coordination / Information Response Meetings (By Owner)

1.3 PROGRESS MEETINGS

- A. Conduct Field / Site Work Coordination meetings at a location and at appropriate times to be determined by the Owner. Notify the Owner no less than 48 hours prior to scheduled meeting date.

Conduct Construction Progress meetings at the Project site, or at such location designated by the Owner at regularly scheduled intervals. At the onset of the project these meeting shall be held on a weekly basis until such time as the frequency is changed by the Owner. Notify the Owner of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.

Conduct Project Coordination / Information Response Meetings at such times as may be required and at a location to be approved by the Owner. Notify the Owner no less than 48 hours prior to scheduled meeting date.

- B. Agenda: Agendas and minutes for Field and Project Coordination meetings will be prepared by whoever (Contractor or Owner) requests the meeting. Agenda for regularly scheduled Construction Progress Meetings will be prepared by the Owner; minutes of those meetings will be prepared by the Contractor.. Review and provide comment on minutes of the previous (Field/Site Coordination, Progress or Project Coordination meetings. Review other items of significance that could affect progress. Include topics for discussion as appropriate in the current status of the Project.
 - 1. Contractor's construction schedule: Review progress since the last meeting. Determine where each activity is in relation to the construction progress schedule, whether on time or ahead or behind schedule. Determine how schedule can be improved if behind.
- C. Reporting: After each Construction Progress meeting date the Contractor will prepare and forward to the Owner, minutes of the meeting for review and comment. The Owner will distribute (corrected) copies of minutes of the meeting to each party present and to other parties who should have been present. Contractor shall include a brief summary, in narrative form, of progress since the previous meeting and report.

1. Schedule Updating: Contractor will revise / update the construction schedule after each Construction Progress Meeting where revisions to the schedule have been made or recognized. Contractor will Issue the revised schedule, to the Owner, concurrently with the report / minutes of each meeting.

PART 2 – PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01315

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SECTION 01320

CONSTRUCTION PROGRESS AND DOCUMENTATION

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Schedule for Submittals
- B. Scheduling Personnel (NIC)
- C. Contract Milestones
- D. Submittal Schedule.
- E. Material Procurement Schedule.
- F. Construction Activities Schedule
- G. Construction Activities Schedule Revisions and Updates.
- H. Short Interval Schedule.
- I. Adjustments of Time for Completion.

1.02 RELATED REQUIREMENTS

- A. Division 0, Bidding and Contract Documents in the Project Manual, more specifically Section 00750, Summary Schedule and Key Milestones apply to this Section.
- B. Division 1, General Requirements in the Project Manual, more specifically Section 01100, Summary of Work, Section 01330, Submittal Procedures and Section 01770, Close Out Procedures apply to this Section.

1.03 SCHEDULING PERSONNEL

Not Included (NIC)

1.04 CONTRACT MILESTONES

- A. Key Milestones developed by the Owner and provided for in Division 0, Section 00750, Summary Schedule and Key Milestones in the Project Manual, are to be incorporated into the Contractor's Construction Schedule.
- B. Key Milestones: Key Contract Milestones (the "Milestones") are significant interim dates on the Critical Path of the Work and within the Contract Time at which certain portions of the Work must be either partially or totally complete in order for the Work to be in compliance with the Contract Documents
- C. Identify all Milestones in the Schedule Submittals, whether or not the Owner has identified those dates in the Bidding and Contract Documents.
- D. Milestones will be clearly identified in all Contractor submitted schedules and will serve as an essential instrument of measurement, by the Owner, of the Contractor's compliance with the Contract Documents.
- E. Failure by the Contractor to achieve Milestones by the Contract Dates may result in Owner implementing contractual remedies, as required, in order to regain the Contract Schedule.

1.05 SCHEDULE FOR SUBMITTALS

- A. Allow ten (10) calendar days for review and turnaround of any submittals as may be required in the Drawings and / or Technical Specifications. All required Submittals shall be forwarded directly to the Architect / Engineer of record with sufficient time to allow for review, approval, fabrication and delivery to support the Schedule as outlined. Copy of the transmittal only must be sent to the Owner.
- B. Incorporate all submittals required by the Contract Documents for the duration of the Contract Time
- C. Integrate the Submittal Schedule into the Contract Schedule and link material and equipment deliveries as appropriate to construction work activities.
- D. Indicate changes from the previous report with an asterisk.
- E. The Contractor shall submit the following as may be appropriate and acceptable to the Owner:
 - 1. Schedule of Submittals and Product Data: To be submitted within ten (10) calendar days from Notice to Proceed (NTP). Schedule shall show submittals commencing within ten (10) calendar days from NTP and completing within sixty (60) calendar days from NTP.
 - 2. Material Procurement Schedule: To be submitted within ten (10) calendar days from NTP.
 - 3. Construction Activities Schedule: To be submitted within ten (10) calendar days from NTP.
 - 4. Short Interval Schedule: To be submitted within seven (7) calendar days from NTP.
 - 5. Inspection and Material Testing Schedule: To be submitted within twenty-one (21) calendar days from NTP.
 - 6. Hot Laid Asphalt and Portland Cement Concrete Pour Schedules: To be submitted no less than five (5) calendar days prior to the date scheduled for the activity.

1.06 MATERIAL PROCUREMENT SCHEDULE

- A. Within ten (10) calendar days after the NTP, develop and submit a Material Procurement Schedule on a form acceptable to the Owner. At a minimum, the Submittal Schedule shall be in the form of (i) a hard copy and (ii) an electronic version (PDF) to be approved by the Owner.
- B. Incorporate all material required by the Contract Documents for the duration of the Contract Time.
- C. Integrate the Material Procurement Schedule with the Schedule of Submittals and the Contract Schedule.
- D. Review the Material Procurement Schedule at the weekly scheduled Construction Progress Meeting.
- E. Submit status of the Material Procurement Schedule with the monthly Contract Schedule Status Submission.
- F. Indicate changes from the previous report with an asterisk.

1.07 CONSTRUCTION ACTIVITIES SCHEDULE

- A. Within ten (10) calendar days following NTP and prior to submission of the first Application for Payment, submit the Construction Activities Schedule (Project Schedule) both in (i) a hard copy and (ii) electronic version (PDF). The Project Schedule shall employ the Critical Path Method (CPM) and may utilize Microsoft Project or equal.
- B. Incorporate all Key Milestones as designated by the Owner in the Contract Documents, Division 0, Section 00750, as well as other Milestones the Contractor identifies as significant points in time.
- C. At a minimum, the Construction Activities Schedule (Project Schedule) shall include the following:
 - 1. A computer generated bar chart, based upon the CPM logic, organized by discipline and resource and sorted by early start, early finish.

2. No work activity shall exceed fifteen (15) working days in duration, unless agreed upon by the Owner.
3. Each activity shall be cost loaded to reflect the estimated value of performing the work. Activity cost shall consist of the sum of labor, materials, equipment, supervision and allocated overhead. The sum of all activity cost shall equal the Contract Sum.
4. All Milestones, submittal dates and completion dates for all shop drawing activities, material procurement, fabrication and delivery dates shall be in support of the Construction Activities Schedule. Anticipated types and durations of usage for major equipment, and any other scheduling data relevant to the Work shall be included. .
5. Activities required for Project Closeout shall include appropriate activities for obtaining Substantial Completion, Punch List, Punch Work, Final Inspections (including pre-inspections and system checkouts), Closeout Submittals (Certificates, Warranties, Manuals, Release of Liens, As-Constructed drawings etc.). Show Milestones for Substantial Completion, Temporary Certificate of Occupancy (where appropriate), Certificate of Occupancy, and Final Completion.
6. Weather conditions, such as high or low ambient temperatures, wind, and/or precipitation, can influence progress of the work shall be considered and allowed for in the planning and scheduling of work. This is to ensure completion of the work within the Contract time. Weather conditions shall be determined by an assessment of average historical climatic conditions based upon the preceding ten (10) year records published for the locality by the U.S. Weather Bureau Service. Weather must be unusually severe and beyond the 10 year average to even be considered as having impacted the Project Schedule.
7. The Project Schedule shall indicate holidays and any non-work days applicable to the schedule.

D. Joint Review, Revision, and Acceptance of the Construction Activities Schedule:

1. Within five (5) calendar days of receipt of Contractor's proposed Construction Activities Schedule (Project Schedule), the Owner and the Contractor shall meet for joint review of the Project Schedule to address corrections or adjustments needed. Any areas that conflict with timely completion of the Work of the Project shall be subject to revision by the Contractor at no cost to the Owner.
2. Within five (5) calendar days after joint review, the Contractor shall revise and resubmit the Project Schedule in accordance with agreements reached during review. Within five (5) calendar days of resubmission of the revised proposed Project Schedule, the Owner and Contractor shall again meet for joint review.
3. Any areas of the schedule still not in compliance shall be corrected and the Project Schedule resubmitted for acceptance within three (3) calendar days of the joint review.
4. If the Contractor fails to define any element of work, activity or logic, and the Owner's review does not detect this error or omission, such error or omission when discovered shall be corrected at the next monthly update without change to Contract Time, and at no cost to the Owner.
5. If the Owner questions Contractor's proposed logic, activity duration or cost, Contractor shall provide satisfactory revisions or adequate justification, within five (5) calendar days of receipt of written request. Any changes to the Project Schedule shall be at the Contractor's sole cost and expense.

E. The Project Schedule shall become the basis for tracking and measuring progress once the Owner has provided written acceptance of the Contractor's submittal. Acceptance of the Project Schedule by the Owner does not relieve Contractor of any responsibilities for the accuracy or feasibility of the schedule, or the Contractor's ability to meet Substantial Completion, Contract Completion and/or Key Milestones – Intermediate dates. Also, acceptance does not warrant, acknowledge or admit the reasonableness of logic, activity duration or cost loading of the Project Schedule.

1.08 CONSTRUCTION ACTIVITIES SCHEDULE REVISIONS AND UPDATES

- A. The Construction Activities Schedule (Project Schedule) shall be updated monthly to show progress and submitted for the Owner's review. The Contractor shall provide the updated Project Schedule with each payment application. This shall include two (2) schedule hard copies and reports along with one electronic version using Microsoft Project or equal software. Non-submittal of the update will be grounds to withhold the Application for Payment.
- B. Updating of the Project Schedule to reflect actual progress shall not be considered revisions to the Schedule. The accepted Project Schedule cannot be changed (revised) without review and acceptance, by the Owner of the Contractor's proposed change.
- C. After the monthly Schedule Update, if the Project Schedule no longer represents actual progress of the Work, Contractor shall revise the Project Schedule to properly reflect progress and resubmit to the Owner. Any costs determined as a product of the Schedule Update shall be borne solely by the Contractor
- D. If Contractor desires to make changes in the Project Schedule to reflect revisions in method(s) of operating and scheduling of Work, Contractor shall notify the Owner in writing, stating the reason for the proposed revision. After the Owner accepts the proposed revision, the Contractor shall implement the revision within three (3) calendar days and submit the Project Schedule to the Owner for review and final approval. Any costs determined as a product of the Project Schedule changes shall be borne solely by the Contractor
- E. In addition, revisions to the Project Schedule that are requested by the Owner shall be made by the Contractor within three (3) calendar days of the requested revision.
- F. All revisions to the Project Schedule shall be identified by an appropriate activity code. The Contractor shall submit the proposed code structure to the Owner for approval. Approval of the codes and requested revision(s) are required prior to revising the accepted Project Schedule.
- G. If the Contractor defaults by failing to submit a Project Schedule, or provide the required updates or revisions, the Owner reserves the right to prepare the Project Schedule, update, or revision back-charging the Contractor for the cost of this work. In such an event:
 - 1. The Owner will request the Contractor's participation in the development of the Project Schedule, update or revision to assure the Project Schedule produced accurately reflects Contract requirements and progress of the Work. The Contractor shall respond and participate in this effort within three (3) calendar days of the Owners request.
 - 2. If the Contractor refuses to participate or cooperate with the Owner, then the Owner will develop the status of the Project Schedule to the best of its ability with the information available.
 - 3. Whether the Contractor participates or not, the Project Schedule shall be issued for the use of a unilateral Change Order to the Contract as may be appropriate and determined by the Owner.

1.09 SHORT INTERVAL SCHEDULE

- A. Within seven (7) calendar days from receipt of Notice to Proceed (NTP) the Contractor shall submit to the Owner a Short Interval Schedule.
- B. The Short Interval Schedule shall be a time-scaled, hand-drawn or computer generated schedule and be consistent with the timing and sequencing of the Construction Activities Schedule (Project Schedule). It is not required to be in a CPM format.
- C. The Short Interval Schedule shall depict all activities planned to occur within the next four (4) weeks from the data date and show status for activities, which have occurred within the prior one (1) week from the data date.
 - 1. Generally, no activity presented in the Short Interval Schedule shall have a duration greater than five (5) working days.
 - 2. The Owner, from time to time, may require the Contractor to further define activities on the Short Interval Schedule that have a duration greater than one (1) day.

- D. The Contractor shall update the Short Interval Schedule at a minimum of once a week for the duration of the project. It shall be submitted to the Owner at regularly scheduled Progress and Coordination meetings. The data date shall be within one (1) workday of the aforesaid meeting.
- E. The Short Interval Schedule shall be utilized with Contractor's prime and sub-contractors and other project parties for the near term coordination of the Work.
- F. All Milestones identified in the Contract and scheduled to take place within the calendar time frame of the Short Interval Schedule shall be included in the Schedule.

1.10 ADJUSTMENT OF TIME FOR COMPLETION

- A. Time for Completion will be adjusted only in accordance with this Clause and the Contract Documents.
- B. Any request for adjustment of time for completion because of changes or alleged delays shall be accompanied by a complete and User Fee Comprehensive **Time Impact Analysis Proposal**, which shall be submitted for approval within five (5) calendar days of the event causing delay. Failure to provide the proper notice within this time frame shall be construed as the Contractor's acceptance that the event causing delay can be absorbed into the Construction Activities Schedule (Project Schedule) without causing a delay to the project completion or any Key Contract milestone date.
- C. Each **Time Impact Analysis Proposal** shall provide information justifying the request and stating the extent of the adjustment requested. Each Analysis shall be in a form and content acceptable to the Owner and shall include, but not be limited to, the general information set forth in this section appropriate to the type of request (change or alleged delay) including the following:
 - 1. A fragnet (a detailed sub-level schedule) CPM Schedule illustrating how Contractor proposes to have the change or alleged delay incorporated into the current Updated Project Schedule.
 - 2. Identification of activities in current updated Project Schedule, which are proposed to be amended due to the change or alleged delay, together with engineering estimates and other appropriate data justifying the proposal.
 - 3. **Time Impact Analysis Proposals** shall be based upon the dates when the change or changes were issued, or dates when alleged delay or delays began, status of work at that time, and shall include time computations for affected activities.
 - 4. Activity delays shall not automatically mean that an extension of the Contract Time is warranted or due to the Contractor. *It is the Owner's intention to own and control all float time indicated in the Project CPM Schedule.*
 - 5. Contract Time Extensions or Key Contract Milestone Adjustments will only be considered when a Critical Path activity or activities are affected and a resulting delay extends the Contract Completion Date or Key Contract Milestone date(s).
 - 6. Adjustment of a Key Contract Milestone date(s) may not necessarily result in an adjustment to the Contract Completion Date.
 - 7. As an alternative to extending the Contract Completion Date or adjusting Key Contract Milestones, the Owner may require the Contractor to adjust the Project Schedule. This shall be accomplished by revising logic, adding resources, working crews on overtime, working additional shifts, and any other mitigating measures that the Owner determines is in the best interest of the project and the Public. Contractor agrees to fully cooperate with the Owner in finding the most effective (least cost) means to accomplish this task when requested.
 - 8. Should the Owner find, after review of the **Time Impact Analysis**, that the Contractor is entitled to an extension of time for completion, the time extension for completion will be considered for approval by the Owner.
 - 9. **Time Impact Analysis** related to Change Order Work and/or Contract Time Extensions shall be incorporated into and attached to the applicable Change Order to be prepared by the Owner.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01320

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SECTION 01330

SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Submit shop drawings, product data, samples, coordination drawings and certifications concurrently as required in the applicable Drawings and / or Technical Specifications.
- B. Prepare and submit to the Owner no later than ten (10) calendar days after receipt of Notice to Proceed (NTP), a list of submittals required by each applicable Section of the Technical Specifications. Submit in accordance with this Section and the requirements of Section 01310, Project Management and Coordination.
- C. Designate in schedule data dates for submission and review of shop drawings, product data and samples and the date of return.

1.02 RELATED REQUIREMENTS

- A. Division 1, General Requirements of the Project Manual.

1.03 SHOP DRAWINGS

- A. Present drawings in a clear and thorough manner. Prepare original, project specific documents- do not reproduce Construction Documents.
- B. Identify details by reference to sheet and detail, schedule or room numbers shown on Contract Drawings or as may be referred to in the Technical Specifications..
- C. Consecutively number shop drawings for each section of Work. Retain numbering system throughout all revisions.
- D. Show detail, material, dimensions, thickness, methods of assembly, attachments and relationship to adjoining Work and other pertinent data and details.
- E. Verify dimensions and field conditions. Clearly indicate field dimensions and field conditions.
- F. Check and coordinate shop drawings of any Section or trade with requirements of other Sections or trades as related and as required for proper and complete installation of Work.
- G. Prepare composite shop drawings and installation layouts when necessary or requested to depict proposed solutions for tight field conditions. Coordinate in field with affected trades for proper relationship to work of other trades based on field conditions.

1.04 PRODUCT DATA

- A. Preparation
 - 1. Annotate each sheet to clearly identify specific product or part installed, and specific data applicable to installation.
 - 2. Show performance characteristics and capacities.

3. Show dimensions and clearances required.
4. Show wiring or piping diagrams and controls.
5. Indicate specified finish.
6. Indicate only those sheets, which are pertinent to specific product(s) with product clearly identified.

B. Manufacturer's standard schematic drawings and documents.

1. Modify drawings and diagrams to delete information which is not applicable to the Work.
2. Supplement standard information to provide information which is applicable to the Work.

1.05 SAMPLES

- A. Provide a minimum of two (2) samples, or as otherwise indicated in the Technical Specifications, of sufficient size to clearly illustrate:
1. Functional characteristics of the product, with integrally related parts and attachment devices.
 2. Full range of color, texture, and pattern.
 3. Samples shall be referenced to the applicable section of the Technical Specifications.

1.06 MANUFACTURER'S CERTIFICATION OF MATERIALS AND EQUIPMENT

- A. Before shop drawings or manufacturer's data for equipment are submitted for approval, a duly authorized manufacturer's representative of the proposed equipment shall review the design of the system relative to the proper operation of his/her equipment and material.
1. Shop drawings and/or manufacturer's data submitted shall include letter from manufacturer's representative certifying that his/her equipment and materials will operate and function satisfactorily under the proposed design conditions. If required by the jurisdiction having authority, data shall be signed and sealed by a South Carolina Registered Engineer in the respective discipline.
- B. Before the work is accepted, a duly authorized manufacturer's representative of the installed equipment shall inspect the installation and operation of his/her equipment and materials to determine that they are properly installed and properly operating in accordance with the manufacturer's recommendations.
- C. Systems requiring certification will be specified in each of the applicable Sections of the Technical Specifications.

1.07 CONTRACTOR REVIEW

- A. Contractor shall review all submittals prior to transmittal to the Architect / Engineer of record and the Owner.
1. The Contractor shall consecutively number all shop drawings and product data transmittals. Re-submittals would have the same number of the previous submittal followed by the suffix "A, B, C etc."
 2. The transmittal is to contain the Owner's RFP / Bid number and the applicable specification section for each product represented on the transmittal.
- B. Apply Contractor's stamp to submittals, initialed or signed by authorized person and dated, certifying: review of submittal, verification of products, field measurements and field construction criteria, and coordination of information within submittal with requirements of Work and the Construction Contract Documents.

- C Submittals without Contractor's stamp or submittals which, in the Owner's and the Architect / Engineer of record opinion are incomplete, contain numerous errors, or have not been checked or have only been checked superficially, will be returned without comments. Delays resulting therefrom shall be solely the Contractor's responsibility.
- D. Clearly note proposed deviations from the Contract Documents on submittals. Submit listing identifying deviations in a format acceptable to the Architect / Engineer of record and the Owner.
- E. Contractor shall be responsible to ensure quantities and dimensions shown on submittals comply with the requirements of the applicable Drawing and Technical Specifications.

1.08 SUBMISSION REQUIREMENTS

A. Make submittals promptly to the Architect / Engineer of record and the Owner in accordance with approved Submittal and Project Progress Schedule and in such sequence as to cause no delay in the Work.

B. Number of submittals required:

1. Shop Drawings: Submit two (2) full size, hard copies and one (1) electronic version (PDF) in addition to what the Contractor will require back; submit one (1) additional electronic version (PDF) each for civil, structural, mechanical, electrical or landscaping work.
2. Product Data: Submit two (2) originals that will be retained by the Architect / Engineer of record and the Owner.
3. Samples: Submit the number stated in each of the respective Technical Specifications, with a minimum of two (2) samples, or as otherwise noted in the applicable Technical Specifications, for each item.

C. Submittals shall contain:

1. Date of submission and dates of any previous submissions.
2. Owner RFP / Bid number.
3. The names of:
 - a. Contractor.
 - b. Subcontractor.
 - c. Supplier.
 - d. Manufacturer.
4. Identification of the product, with the applicable Specification Section number.
5. Field dimensions, clearly identified as such.
6. Relation to adjacent or critical features of the Work or Materials.
7. Applicable standards, such as ASTM or Federal Specification numbers.
8. Identification of deviations from Contract Documents and justification.
9. Identifications of revisions on re-submittals.
10. Additional information as required by Contract Documents.
11. An 8 in. x 3 in. blank space for Contractor and Architect/Engineer stamps.

D. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by the Architect / Engineer of record or Owner review of submittals

E. Numbering system established by the Contractor and shall be agreeable to the Owner.

1.09 RESUBMISSION REQUIREMENTS

- A. Contractor will make any corrections or changes in the submittals required by the Architect / Engineer of record or the Owner, mark number of submission, and resubmit as required until approved; none of this shall be of any cost to the Owner.
- B. Shop Drawings and Product Data:
 - 1. Contractor will revise initial drawings and data, and resubmit as specified for the initial submittal.
 - 2. Contractor will indicate any changes which have been made other than those requested by the Architect / Engineer of record or the Owner.
 - 3. Mark number of submission and resubmit until accepted.
- C. Samples: Contractor will submit new samples as required for initial submittal. Remove samples, which are “rejected” or designated “resubmit.”

1.10 REVIEW RESPONSIBILITIES – ARCHITECT / ENGINEER OF RECORD (A/E)

- A. The A/E shall review submittals, when applicable, with responsible promptness in accordance with the requirements of the Project Manual.
- B. The A/E will affix stamp and initials or signature, and indicate requirements for revisions and re-submittal, if any.
- C. The A/E will return submittals to Contractor, with copy of transmittal to Owner, for distribution, or for resubmission within five (5) days of original receipt.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used.

END OF SECTION 01330

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SECTION 01331

SCHEDULE OF VALUES

PART 1 – GENERAL

1.01 RELATED REQUIREMENTS

- A. Contractor shall submit to the Owner a Schedule of Values with line items allocated to various portions of the Work for the purpose of monitoring the progress of the work and administration of the Application for Payment Process with their response (Bid) to the RFP.
- B. Provide Owner, after receipt of the Notice to Proceed (NTP) and upon request by the Owner, including support values and data substantiating their accuracy and correctness.
- C. Division 0, Bidding and Contract Documents in the Project Manual.
- D. Division 1, General Requirements in the Project Manual.

1.02 FORM AND CONTENT

- A. The Schedule of Values shall be tabulated to correspond with the Contractor's Application for Payment form, and shall be identified with:
 - 1. Title of Project, Location and Owner RFP or Bid Number.
 - 2. Project Manager for Contractor
 - 3. Name and Address of Contractor
 - 4. Contract Designation
 - 5. Date of Submission
- B. Schedule of Values shall be presented in accordance with the CSI format on a line item basis
- C. Listing of Component Items:
 - 1. Identify each line item with the number and title of the respective major section of the Technical Specifications.
 - 2. Provide breakdown of Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and Progress Reports. Break principal subcontract amounts down into several line items by completed task in various locations.
 - 3. Round off amounts to nearest whole dollar, total of all listed values shall equal total Contract Sum.
 - 4. For each part of the Work where an Application for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed, provide separate line items on Schedule of Values for initial cost of materials, for each subsequent state of completion, and for total installed value of that part of the Work.
 - 5. Costs of actual work-in-place may be shown as separate line items in Schedule of Values, such as:
 - a. Bonds
 - b. Insurance
 - c. Temporary facilities, services and controls.
 - d. Field supervision and layout
 - e. Testing
 - 6. Separate material cost and labor cost as directed or requested by the Owner
- D. For each major line item whose value is larger than five thousand dollars (\$5,000.00) list sub-values of major products or operations under the item.

E. For various portions of the Work:

1. Each item shall include a directly proportional amount of overhead and profit.
2. For items on which progress payments will be requested for stored materials, break down the value into:
 - a. Cost of materials, delivered and unloaded, with taxes paid.
 - b. Total installed value.

F. The sum of all values listed in the Schedule of Values must equal the total Contract Sum.

1.03 SUB-SCHEDULE OF UNIT MATERIAL VALUES

A. Not Included (NIC)

1.04 RESUBMITTAL

- A. After review by the Owner, the Contractor may be requested to revise and resubmit Schedule of Values as may be determined appropriate by the Owner.
- B. Revised and approved Schedule of Values shall be resubmitted as part of monthly Application for Payment.

1.05 MATERIALS STORED OFF - SITE

- A. Payment for materials and equipment stored off – site, and not on the property of Georgetown County shall be subject to, and comply with the following:
 1. Prior written approval from the Owner, of materials and equipment to be stored, and location of facilities to be used for storage.
 2. Storage of materials and equipment will be in a bonded warehouse. Proof of insurance shall be provided to the Owner in the name of Georgetown County.
 3. Contractor shall furnish an inventory, including invoices, for all stored materials and equipment that are included in the Application for Payment using a form acceptable to and approved by the Owner.
 4. Contractor shall issue a Bill of Sale to the Owner for all items.

PART 2 - PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01331

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SECTION 01400

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Contractor's Quality Control (QC), in addition to customary testing and control requirements and those included in the Construction Contract Documents.
- B. Manufacturer's field services, coordinated by the Contractor.

1.02 RELATED REQUIREMENTS

- A. Division 0, Bidding and Contract Documents of the Project Manual.
- B. Division 1, General Requirements of the Project Manual.

1.03 GENERAL QUALITY CONTROL

- A. Maintain Quality Control over construction activities, suppliers, manufacturers, products, services, site conditions, and workmanship of all personnel to assure Work is of specified quality.
- B. Quality inspections:
 - 1. Contractor shall be the first line of quality control and shall review all items for compliance with the Drawings and Technical Specifications reviewed and approved by the Owner. Prior to the Contractor's Testing Laboratory inspectors performing Quality Assurance (QA) review and inspections such as rebar placement, asphalt and concrete, piling inspection, soil compaction, etc., the Contractor shall have verified conformance to the requirements of the Construction Contract Documents, plans and technical specification prepared by the Architect / Engineer of record and reviewed and approved by the Owner.
 - 2. Maintain a written Quality Assurance / Control Program establishing the methods of assuring compliance to the contract documents. The Program shall be submitted to, reviewed and approved by the Owner. Quality Control personnel shall be identified at the initiation of the Project and shall be adequate to monitor the Work effectively and to enforce the Quality Assurance / Control procedures.
 - 3. Inspect each phase of Work for compliance with Contract Documents, plans and specification prepared by the Architect / Engineer of record and reviewed and approved by the Owner.
 - 4. Contractor shall have defective conditions corrected before calling for inspections and starting subsequent operations which would cover or are dependant upon the Work in question.
 - 5. Where visual inspection is not sufficient, such as in verifying slope of pavement or depth of retention / detention ponds for proper drainage, use instruments with qualified operators to inspect work.
 - 6. Secure the services of a testing laboratory when necessary to assist in evaluating quality.

1.04 WORKMANSHIP

- A. Comply with industry standards, except when more restrictive tolerances or specified requirements are called for in Construction Contract Documents, plans and specifications prepared by the Architect / Engineer of record and reviewed and approved by the Owner.
- B. Perform work by persons qualified to produce workmanship of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stress, vibration and other forces such as, but not limited to hurricane force winds.

1.05 MANUFACTURER'S INSTRUCTIONS

- A. When required by the Technical Specifications, submit manufacturer's current printed instructions, in the quantity required for product data, for delivery, storage, assembly, installation, startup, adjusting and finishing, as necessary.
- B. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Construction Contract Documents, plans and technical specifications prepared by the Architect / Engineer of record and reviewed and approved by the Owner, Contractor shall re-submit and provide written clarification and explanation to the Architect / Engineer of record and the Owner.

1.06 MANUFACTURER'S CERTIFICATES

- A. When required by the Technical Specifications, supplier/manufacturer shall provide qualified personnel to observe field conditions, conditions of the surfaces and installation, quality of workmanship, start-up of equipment, testing, adjusting and balancing of equipment as applicable, and to make appropriate recommendations.

1.07 MANUFACTURER'S FIELD SERVICES

- A. When specified in the respective Technical Specification Sections, the supplier/manufacturer will provide qualified personnel to observe field conditions, conditions of the surfaces and installation, quality of workmanship, start-up of equipment, testing, adjusting and balancing of equipment as applicable, and to make appropriate recommendations.
- B. Manufacturer's Representative shall submit written report to Architect / Engineer of record and the Owner listing observations and recommendations.

1.08 CONTRACTOR'S CERTIFICATION

- A. Contractor shall supply written certification that the Work, as installed, has been reviewed by him/her for compliance with the Contract Documents, applicable Drawings and Technical Specifications.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01400

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SECTION 01410

TESTING LABORATORY SERVICES

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall employ and pay for the services of an Independent Testing Laboratory to perform specified testing of work and materials at the Project Site or at point of manufacture under the provided allowance. Contractor shall incorporate recommendations from testing results.
- B. The Contractor shall comply with and be responsible for all of the requirements of the Project Manual, without exception.

1.02 RELATED REQUIREMENTS

- A. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders, or approvals of public authorities.
- B. Each specification section listed: Inspection and laboratory testing required, and standards for testing.
- C. Division 1, General Requirements of the Project Manual.

1.03 QUALIFICATIONS OF LABORATORY

- A. Meet “Recommended Requirements for Independent Laboratory Qualification,” published by American Council of Independent Laboratories.
- B. Comply with the following requirements:
 - 1. ANSI/ASTM D3740: Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
 - 2. ANSI/ASTM E329: Standard Recommended Practice for Inspection and Testing for Concrete, Steel, and Bituminous Materials as Used in Construction.
- C. Authorized to operate in the State of South Carolina
- D. Submit copy of report of inspection of facilities made by Materials Reference Laboratory of National Bureau of Standards during the most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.
- E. Testing Equipment:
 - 1. Calibrated at reasonable intervals by devices of accuracy traceable to either:
 - a. National Bureau of Standards.
 - b. Accepted values of natural physical constants.

1.04 LABORATORY DUTIES

- A. Cooperate with the Owner and Contractor; provide qualified personnel after due notice from Contractor.
- B. Perform specified inspections, sampling and testing of materials and methods of construction:
 - 1. Comply with specified standards.
 - 2. Ascertain compliance of materials with requirements of Contract Documents.
- C. Promptly notify Owner and Contractor of observed irregularities or deficiencies of work or products.
- D. Promptly submit written report of each test and inspection: one (1) copy each to Owner and Contractor. Each report shall include:
 - 1. Date issued.
 - 2. Project title and Bid Number
 - 3. Testing laboratory name, address and telephone number.
 - 4. Name and signature of laboratory inspector.
 - 5. Date and time of sampling or inspection.
 - 6. Record of temperature and weather conditions.
 - 7. Date of test.
 - 8. Identification of product.
 - 9. Location of sample or test in the Project.
 - 10. Type of inspection or test.
 - 11. Results of tests and compliance with Contract Documents.
 - 12. Interpretation of test results, when requested by Owner
- E. Perform additional tests as may be required.

1.05 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

- A. Laboratory is not authorized to:
 - 1. Release, revoke, alter or enlarge on requirements of Contract Documents.
 - 2. Approve or accept any portion of the Work.
 - 3. Perform any duties of the Contractor.
 - 4. Stop the Work.

1.06 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate, together with laboratory personnel, will provide access to the point/location of the Work, and to manufacturer's operations.
- B. Secure and deliver to laboratory at designated location(s) adequate quantities of representational material proposed to be used and which require testing together with applicable proposed design mixes.
- C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes which required control by the testing laboratory.
- D. Furnish copies of Products test reports to the Owner as required.

- E. Furnish incidental labor and facilities:
 - 1. To provide access to Work to be tested.
 - 2. To obtain and handle samples at the Project Site or at the source of the product to be tested.
 - 3. To facilitate inspections and tests.
 - 4. For storage and curing of test samples.
- F. Notify laboratory twelve (12) hours in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
- G. Make arrangements with laboratory and pay for services to perform inspections, sampling and testing required.

1.07 SOURCE OF MATERIALS

- A. Source of supply of each of materials required shall be acceptable to the Owner and before delivery is started.
- B. Representative samples shall be submitted for inspection or tests.
- C. Results obtained from testing samples will be used for preliminary approval, but will not be used as final acceptance of materials.
- D. If it is found that sources of supply, which have been approved, do not furnish product of uniform quality, or if product from any source proves unacceptable at any time, Contractor shall furnish approved material from another source without additional cost to Owner or delay in completion date.

1.08 IDENTIFICATION

- A. Required samples submitted by Contractor shall be properly labeled for identification.
- B. Materials and/or equipment that have been inspected and/or tested shall be stored in a controlled area with suitable identification referencing tests and certifications.
- C. Continuous inventory shall be kept of all items in this area controlled by log in and log out with receiving and disbursing signatures.
- D. Copies of receiving or disbursing actions shall be sent to the Owner on a daily basis.
- E. Disbursing records shall show final destination and installation.

1.09 MATERIAL STORAGE

- A. Materials shall be stored so as to ensure preservation of their quality and fitness for Work, in accordance with requirements of Section 01620, Storage and Protection.

1.10 SCHEDULE OF INSPECTIONS AND TESTS

- A. Refer to each individual Section of the Project Manual for specific testing requirements, or as otherwise required by the Contract Documents or appropriate regulatory agency.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01410

SECTION 01500

TEMPORARY FACILITIES AND UTILITIES

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall comply with and be responsible for all of the requirements of the Project Manual and the Construction Contract Documents.
- B. Furnish, install and maintain temporary utilities required for construction, to be removed at completion of Work.
- C. Provide and maintain methods, equipment, and temporary construction required to control environmental conditions at construction site and other areas under Contractor's control. Remove evidence of temporary facilities at completion of Work.
- D. Furnish and pay for installation of all temporary utilities, permanent utilities except as provided by Owner, or fuel required for testing of installed equipment and systems.

1.02 RELATED REQUIREMENTS

- A. Division 1, General Requirements of Project Manual.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

- A. Comply with National Electric Code (NEC), federal, state, and local codes and regulations and with utility company requirements.
- B. Comply with State of South Carolina regulatory agencies having judicial authority.
- C. All affected Utility Organizations should be contacted by the Contractor to arrange temporary utilities. The appropriate Utility Organization, as well as other Contacts are listed on the cover sheet of the construction contract drawings.

PART 2 – PRODUCTS

2.01 MATERIALS, GENERAL

- A. Materials may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

2.02 TEMPORARY ELECTRICITY AND LIGHTING

- A. Arrange with Santee Electric Cooperative.
- B. Contractor will pay all electrical consumption charges.

2.03 TEMPORARY HEAT AND VENTILATION

Not Used

2.04 TEMPORARY TELEPHONE SERVICE

Not Used

2.05 TEMPORARY WATER

- A. Arrange with Georgetown County Water & Sewer District for temporary service.
- B. Furnish and install temporary water line and distribution from a point designated by the Owner, if determined to be necessary.
- C. Contractor will pay all water consumption charges.

2.05 DRINKING WATER

- A. The Contractor shall furnish potable water for drinking of all personnel connected with the Work of this contract.
- B. Pipe or transport water to keep clean and fresh.
- C. Provide drinking water in suitable containers or dispensers and paper cups located in close proximity to where work is in progress.

2.06 TEMPORARY SANITARY FACILITIES

- A. Provide portable chemical-type sanitary facilities in compliance with applicable health laws, and state, county and local regulations and ordinances.
- B. Service, clean and maintain facilities and enclosures.
- C. Facilities shall be fitted with approved sanitary holding capacity and shall be emptied periodically to prevent overflow. Legal disposal of sanitary waste must be off-site and is Design/Builder's responsibility.
- D. Construction workers and project staff shall not use permanent plumbing facilities
- E. Sanitary facilities failing to meet required standards or maintenance methods shall be corrected immediately.
- F. Contractor will pay all costs for installation, maintenance and removal.

2.07 TEMPORARY FIRE PROTECTION

- A. During construction, provide temporary fire protection and life safety provisions in accordance with local jurisdiction requirements, the International Code and / or NFPA Standards.
- B. A "Hot Work" permit may be required when welding or cutting operations are to take place. Take necessary precautions in welding or cutting operations to keep work area free of combustible materials. Do not use welding equipment around flammable liquids or vapors.
- C. Keep welding and cutting equipment outdoors wherever possible. Remove welding and cutting equipment from any structure daily, wherever practical.

- D. At completion of welding or cutting operations, inspect work and adjacent area for hazards. When operations are near any building opening, inspect areas above, below or adjacent to work area hazards.
- E. Do not open, turn off, interfere with, attach any pipe or hose to, or connect anything to any fire hydrant, stop valves, or stop cock, or tap any water main without prior written permission of proper authority or the Owner.

PART 3 – EXECUTION

3.01 GENERAL

- A. Comply with local jurisdiction and all other applicable requirements as stated in this Section.
- B. Contractor shall obtain and pay for all required permits for the Work.

3.02 REMOVAL

- A. Completely remove from the project site temporary materials and equipment when their use is no longer required.
- B. Clean and repair damage caused by temporary installations or use of temporary facilities immediately after removal.
- C. Restore existing facilities used for temporary services to specified, or to original, condition.
- D. Restore permanent facilities used for temporary services to specified condition.

END OF SECTION 01500

SECTION 01510

TEMPORARY CONSTRUCTION CONTROLS

PART 1- GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall comply with and be responsible for all of the requirements of the Project Manual, without exception.
- B. Furnish, install and maintain temporary controls required for construction.
- C. Remove all temporary controls at completion of Work.

1.02 RELATED REQUIREMENTS

- A. Division 1, General Requirements of the Project Manual.

1.03 CONSTRUCTION SITE CLEANING

- A. Maintain areas within limits of the Project Work Site free of extraneous debris and litter.
- B. Initiate and maintain specific program to prevent accumulation of debris at construction site, storage and parking areas, or along access roads and off site hauls routes.
 - 1. Furnish on-site containers for collection of waste materials, debris and rubbish.
 - 2. Prohibit overloading of trucks to prevent spillage on access and haul routes.
 - 3. Provide periodic inspection of traffic areas to enforce requirements.
 - 4. Remove waste material, debris and rubbish from site and building area daily, or sooner as otherwise needed.
 - 5. Do not drop or throw materials from heights. Lower waste material in a controlled manner and with as few handlings as possible.
 - 6. During entire construction period, and at all times, keep the site access entry road, parking areas free from accumulation of waste materials, debris and rubbish caused by the Work of this Project.
 - 7. Dirt and debris shall be removed from all surfaces prior to closure of all areas (walls, ceilings, chases, etc.).
- C. Hazards Control:
 - 1. Store volatile wastes in covered metal containers.
 - 2. Remove containers from premises daily.
 - 3. Prevent accumulation of wastes, which create hazardous conditions.
 - 4. Provide adequate ventilation during use of volatile or noxious substances.
- D. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws:
 - 1. Do not burn or bury rubbish and waste materials on project site.
 - 2. Do not dispose of wastes into streams or waterways.
 - 3. Do not dispose of volatile wastes such as mineral spirits, oil or paint thinner in storm or sanitary drains.

1.04 DUST CONTROL

- A. Provide positive methods and apply dust control materials to minimize raising dust from construction operations and provide positive means to prevent air-borne dust from dispersing into atmosphere.
- B. Clean interior building areas to prevent accumulation of dirt and debris and execute prior to start of finish painting, special coatings, and/or other finish material installations.
- C. Wet down materials and rubbish to prevent blowing dust.
- D. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.
- E. Continue cleaning on an as-needed basis until building and/or site is ready for beneficial occupancy.

1.05 EROSION AND SEDIMENT CONTROL

- A. Plan and execute construction and earthwork by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation. Wetland areas shall be protected as well.
 - 1. Hold areas of bare soil exposed at one time to minimum.
 - 2. Provide temporary control measures such as berms, dikes, and drains.
 - 3. Comply with federal, state and local regulations.
- B. Construct fills and soil waste areas by selective placement to eliminate surface soils or clay, which will erode.
- C. Periodically inspect earthwork to detect any evidence of start of erosion, apply corrective measures as required for erosion control.

1.06 POLLUTION CONTROL

- A. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by discharge of noxious substances from construction operations.
- B. Contractor is responsible only for pollution control of the immediate Work of the Contract, the actions and operations of the Contractor, and the workers employed or contracted to Contractor. Provide equipment and personnel to perform emergency measures required to contain spillage, and to remove contaminated soil or liquids.
- C. Take special measures to prevent harmful substances from entering public waters. Prevent disposal of wastes, effluents, chemicals or other such substances adjacent to basins, or in sanitary or storm sewers.
- D. Provide systems for control of atmospheric pollutants. Prevent toxic concentrations of chemicals. Prevent harmful disposal of pollutants into atmosphere.

1.07 WATER CONTROL

- A. Provide methods to control surface water to prevent damage to project site or adjoining properties. Control fill, grading, and ditching to direct surface drainage away from excavations, pits, tunnels and other construction areas. Direct drainage to proper runoff.
- B. Provide, operate, and maintain hydraulic equipment of adequate capacity to control surface and water.
- C. Dispose of drainage water in manner to prevent flooding, erosion or other damage to any portion of site or adjoining areas.
- D. Dewater areas in accordance with applicable local and state requirements and accepted professional practice.

1.08 EARTH CONTROL

- A. Contractor shall, at his/her sole cost, remove excess soil, pier spoils, etc., at time of generation.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTIONS

3.01 REMOVAL

- A. Contractor shall, at his/her sole cost, remove temporary construction controls at the completion of the Work, or as required by execution of the Work or as may be directed by the Owner..

END OF SECTION 01510

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SECTION 01530

BARRIERS

PART 1 – GENERAL

1.01 REQUIREMENTS

- A. The Contractor shall comply with and be responsible for all the requirements of Division 1, General Requirements of the Project Manual, without exception.
- B. Provide and maintain barriers and lighted barriers for the protection of personnel and materials in accordance with the requirements of applicable state and local codes.
- C. Install barriers at the start of construction.

1.02 RELATED WORK

- A. Section 01510, Temporary Construction Controls

1.03 REGULATORY AGENCIES

- A. Comply with federal, state, and local, municipal regulations and with utility company and insurance agencies' requirements.

PART 2 – PRODUCTS

2.01 MATERIALS, GENERAL

- A. Materials and equipment must be adequate in capacity for the required usage, and not violate applicable codes and standards.
- B. Provide warning signs to help prevent damage and injury.
- C. Should it become necessary to remove safety items it shall be the Contractor's responsibility to replace the item immediately in conformance with applicable codes, standards and regulations.
- D. Wood materials used in barricades and barriers within any building and in material storage areas shall be fire-retardant.

2.02 BARRICADES

- A. Protect all vertical shafts with safe, temporary railings, adequately braced.
- B. Cover trenches and holes when not in use. Erect barriers at sharp changes in plane of more than 3 feet.
- C. Protect all building openings with safe, temporary railings adequately braced.

2.03 CONSTRUCTION FENCE

- A. Prior to starting work at Project Site the Contractor, as may be directed by the Owner, shall install enclosure fence with locked entrance gates.
- B. Provide construction fence around material storage and construction areas to prevent unauthorized access. Comply with local, municipal and / or Georgetown County requirements for construction barriers.
- C. Provide minimum number of gates, padlocked during non-working hours as may be directed by the Owner.
- D. Locate personnel gates as necessary to provide controlled entry from construction parking to construction area, as may be directed by the Owner.

2.04 PERIMETER SIGNAGE (NIC)

2.05 CONSTRUCTION LIGHTING

- A. Provide construction lighting throughout construction areas as may be required and necessary to maintain safety and security.
- B. Maintain lighting on a daily basis, including weekends, holidays, and foul-weather days so that the Project Site is adequately lighted at all times in the interest of safety and security.

PART 3 – EXECUTION

3.01 REMOVAL

- A. Contractor shall, at his/her sole cost, completely remove barricades, including barricades foundations when construction has progressed to a point that they are no longer required, and when requested by the Owner.

3.02 CLEANING

- A. Clean and repair damage caused by the Work of this Section. Fill and grade the areas of the Site to required elevations and slopes, and clean the area.

END OF SECTION 01530

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SECTION 01550

ACCESS ROADS AND PARKING AREAS

PART 1 – GENERAL

1.01 REQUIREMENT INCLUDED

- A. The Contractor shall comply with and be responsible for all the requirements of Division 1, General Requirements of the Project Manual without exception.
- B. Access to and egress from the Project Site will be gained only via routes and through gates as approved by Owner. Equipment weight and height limits will be strictly enforced. Contractor is responsible for providing access roads capable of supporting construction traffic. Contractor and trade contractors of all tiers shall be responsible to comply with these requirements.
- C. Install barriers and necessary traffic controls at start of construction to protect public and leave in place throughout construction. Remove at end of construction.
- D. Contractor is responsible for assessing risk to public and providing lights, flagmen, traffic signals, stop signs or other necessary controls, as needed and approved by the Owner and / or the South Carolina Dept. of Transportation (SCDOT).
- E. Contractor shall be responsible to repair all damage to offsite street, roads, curbs along haul routes and any existing site elements damaged by construction related traffic.

1.02 RELATED WORK

- A. NIC

1.03 REGULATORY AGENCIES

- A. Comply with federal, state and local codes and regulations, and with utility company and insurance agencies' requirements.

PART 2 – PRODUCTS

2.01 GENERAL

- A. If repair to public or private roadways is necessary due to damage by construction traffic, materials and methods used for repairs are to be acceptable to the applicable jurisdictional authority and are to match existing conditions. Contractor shall perform such work at his/her sole cost and expense.
- B. Provide warning signs to help prevent damage and injury and to promote safety..
- C. Should it become necessary to remove safety items, it shall be Contractor's responsibility to replace them immediately, in conformance with applicable regulations. Contractor shall perform such work at his/her sole cost and expense.

2.02 PARKING

- A. Contractor's vehicles and employee parking shall be confined to an area identified within the site limits and as directed by the Owner.

2.03 STAGING

- A. Contractor shall confine materials, products, equipment and temporary facilities within site limits and as directed by the Owner.

PART 3 – EXECUTION

3.01 REMOVAL

- A. Temporary construction access roads, drives, walks, and parking areas shall be removed at completion of Work or as required by execution of Work at the Contractor's sole cost and expense.
- B. Areas shall be returned to original condition unless otherwise required by the Owner.

END OF SECTION 01550

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SECTION 01563

HANDLING OF INCIDENTAL FUEL SPILLAGE

PART 1 – GENERAL

1.01 RELATED REQUIREMENTS

- A. Division 0, Bidding and Contract Documents in the Project Manual.
- B. Division 1, General Requirements in the Project Manual.
- C. South Carolina Dept. of Health and Environmental Controls (SCDHEC)

1.02 SCOPE

- A. This section consists of procedures to be followed in handling material contaminated with petroleum fuel products (hydrocarbons including petroleum, petroleum derivatives, hydraulics and like products) caused by incidental spillage (including leaks) from the Contractor's or his/her prime and sub-contractor's equipment.

Incidental spillage shall mean spillage of a quantity not greater than 25 gallons per incident, of vehicular or mechanical equipment fuel products, onto open ground and absorbed or not absorbed by the soils.

Spillage or leakage of petroleum fuel products in quantities in excess of 25 gallons shall be immediately remediated by the Contractor using applicable and appropriate procedure(s). Whenever such spillage or leakage occurs, the Contractor shall immediately implement the appropriate corrective actions as required.

- B. The provisions of this Section are limited to incidental petroleum fuel spillage on ground surfaces and it excludes fuel spillage onto surface waters.

1.03 APPLICABLE CODES

- A. The Contractor shall comply with all prevailing federal, state, and local environmental protection ordinances and codes governing and having application to and any discharges, intentional or accidental, which may cause water pollution and constitute a nuisance, and sanitary nuisance.
- B. Leaks and spillage may occur when using mechanical equipment. Equipment generated or lubricated with petroleum products, is prone to leaks or spillages, therefore proper management of "spillage incidents" is essential.

PART 2 – PRODUCTS

2.01 ABSORBENT MATERIALS

Contractor shall equip crews and/or provide machinery with the most efficient type of petroleum absorbent materials. These materials are available at petroleum equipment suppliers and must be readily accessible so that spillages can be quickly contained and prevented from becoming greater incidents. Fiber material, sand or cat litter may be used as an absorbent material. Sufficient quantity of absorbent material capable of absorbing up to 25 gallons of petroleum fuel products shall be stocked at the job site at all times.

PART 3 - EXECUTION

3.01 PROCEDURES

- A. Personnel handling waste materials must have a minimum of 40 hours training as defined in 29 CFR 1910.120 and in accordance with the certified OSHA course.
- B. Perform work as specified herein and in accordance with the applicable provisions of South Carolina Dept. of Transportation (SCDOT) and South Carolina Dept. of Health and Environmental Controls (SCDHEC). No payment will be made to the Contractor for the cost of handling and disposing of leaks, spillages and materials, soils and environment contaminated by such leaks or spillages.

The procedure for the proper handling and disposal of contaminated soils and absorbent materials is readily available through the aforementioned agencies:

- C. The steps outlined below are minimum requirements and are merely presented as guidelines. They do not constitute a complete compliance procedure.

STEP 1:

If a fuel contamination to open ground has been discovered, check for the origin of that leak or spillage. Then stop the spillage or leak and positively contain it, and then use absorbents to collect the discharged liquid. Immediately notify the Owner.

STEP 2:

Sand may be used to absorb ground surface spills while absorbent materials may be used to absorb ground spills as well as surface water spills.

Once absorption of spilled fuels is complete the impacted (contaminated) absorbent materials shall be stored in 55-gallon steel drums (100-150 lbs.). If leaked or spilled fuel has been absorbed into the soils, excavate and containerize the impact (contaminated) soils. Soils may be stored in 55- gallon steel drums.

STEP 3:

The contaminated materials must be collected, containerized and otherwise properly stored and labeled prior to transport to a pre-approved storage, disposal or treatment facility. All drums used to store impacted (contaminated) absorbent material and/or contaminated soils shall be properly sealed and labeled with the following information.

Name of Company (Contractor)

RFP / Bid No.:

Location of origin:

Type of contents:

Type of containment:

Quantity: (e.g. 1 of 1)

Date:

Containerized by:

Labeled by:

END OF SECTION 01563

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SECTION 01570

TRAFFIC REGULATION

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall comply with and be responsible for all of the requirements of the Project Manual, without exception.
- B. Construction parking control, flagmen, flares and lights, haul routes, traffic signs and signals, and removal.
- C. The Contractor shall comply with and be responsible for traffic control planning and implementation as may be directed and approved by SCDOT and the Owner.
- D. Maintenance of safety and convenience of public.

1.02 RELATED WORK

- A. Division 1, General Requirements of the Project Manual.

1.03 PUBLIC SAFETY AND CONVENIENCE

- A. Materials and equipment shall be stored and Work conducted to minimize obstruction to pedestrian movement and vehicular traffic. Materials and equipment stored in or near path of traffic shall be protected with appropriate warning signs and barricades. At night, or as otherwise required, equipment not in use shall be stored in such manner and location to not interfere with safe passage of pedestrians and vehicles. Contractor shall provide and maintain flagmen at points and for periods of time required to provide safety and convenience of traffic, and as may be required by the SCDOT and as directed by the Owner
- B. Contractor shall not close traffic to any bridge, culvert, or any other portion of public road except as designated in the Construction Contract Documents. Prior to closing any access way and/or structure coordinate Work schedule with the Owner and the SCDOT if applicable.
- C. Contractor shall provide the Owner with notice at no less than 48 hours prior to movement of heavy equipment and/or wide or slow moving vehicles to or from Project Site. Contractor shall strictly adhere to vehicular routes established or as may be directed by the Owner and / or the SCDOT if applicable.

1.04 HAUL ROUTES

- A. Based on regulations prescribed by the South Carolina Dept. Transportation (SCDOT), Georgetown County or any other agency having jurisdiction, use only established roadways or use temporary roadways constructed by Contractor when and as authorized by the Owner. When materials are transported in executing the Work vehicles shall not be loaded beyond loading capacity recommended by manufacturer of vehicle or prescribed by federal, state, or local law or regulation. When it is necessary to cross curbs or sidewalks, Contractor shall protect them from damage, and shall repair or pay for repair of all damaged curbs, sidewalks, roads and/or paving.

1.05 TRAFFIC SIGNS AND SIGNALS

- A. At approaches to site and on-site, install signs or signals at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public vehicular and pedestrian traffic. This should be included in the Contractor's approved Traffic Control Plan.
- B. Install and operate traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control, and areas affected by Contractor's operations.
- C. Relocate traffic control signs and signals as Work progresses, to maintain safe and effective traffic control.
- D. Coordinate with construction signs described in Section 01580, Project Identification and Signs.

1.06 FLAGMEN

- A. Provide trained and equipped flagmen to regulate traffic when construction operations and/or traffic encroach on public vehicular or pedestrian traffic lanes.

1.07 FLARES AND LIGHTS

- A. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic in landside areas only.

PART 2 – PRODUCTS

2.01 SIGNS, SIGNALS AND DEVICES

- A. Post-mounted and wall-mounted at parking areas to indicate spaces designated for use by construction personnel.
- B. Traffic control signals, as required, and as approved by SCDOT and the Owner.
- C. Traffic cones and drums and lights, as approved by SCDOT and the Owner.
- D. Flagmen equipment as required by SCDOT and the Owner.

PART 3 – EXECUTION

3.01 REMOVAL

- A. Contractor shall remove equipment and devices, at his/her sole cost, when no longer required. Repair damage caused by installation. Remove post settings to depth of three (3) feet.

END OF SECTION 01570

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SECTION 01580

PROJECT IDENTIFICATION AND PERMIT BOX

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall comply with and be responsible for all requirements of the Project Manual, without exception.
- B. The Contractor shall comply with applicable requirements in this Section and more specific requirements of Section 00800, Special Project Conditions and Section 01100, Summary of Work.
- C. Furnish, install and maintain typical Permit Box as approved by the Owner.
- D. Provide temporary, on site informational signs to identify key elements of the construction facilities.
- E. Remove the Permit Box upon completion of the construction Work of this contract.
- F. Permit Box to be mounted on a utility pole near the project entrance within fifteen (15) calendar days of the Notice to Proceed (NTP).

1.02 RELATED REQUIREMENTS

- A. Division 1, General Requirements of the Project Manual.

PART 2 – PRODUCTS

2.01 SIGN MATERIALS

To Be Determined By the Owner

2.02 TEMPORARY SIGNAGE

To Be Determined By the Owner

PART 3 – EXECUTION

3.01 PREPARATION

The Contractor shall be responsible for the cost of preparing and installing the Permit Box

3.02 MAINTAINANCE

The Contractor shall be responsible for the cost of maintaining the Permit Box.

3.03 REMOVAL

The Contractor shall be responsible for the cost of removing the Permit Box.

END OF SECTION 01580

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SECTION 01600

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- A. Division 0, Bidding and Contract Documents of the Project Manual without exception.
- B. Division 1, General Requirements of the Project Manual without exception.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling requests for substitutions made after award of the Construction Contract.
- B. Procedural requirements governing the Contractor's selection of products and product options are included under Section 01610, Materials and Equipment.

1.3 DEFINITIONS

- A. Definitions used in this Section are not intended to change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "Substitutions." The following are not considered substitutions:
 - 1. Substitutions requested by Bidders during the bidding period, and accepted prior to award of Contract, are considered as included in the Construction Contract Documents and are not subject to requirements specified in this Section for substitutions.
 - 2. Revisions to Construction Contract Documents requested by Georgetown County
 - 3. Specified options of products and construction methods included in Contract Documents.
 - 4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.4 SUBMITTALS

- A. Substitution Request Submittal: Requests for substitution will be considered if received within thirty (30) calendar days after commencement of the Work. Requests received more than thirty (30) calendar days after commencement of the Work may be considered or rejected at the discretion of the Owner.
 - 1. Submit three (3) copies of each request for substitution for consideration. Submit requests in the form to be provided by the Owner and in accordance with procedures required for Change Order proposals to be established by the Owner
 - 2. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Technical Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:

- a. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
 - b. Samples, where applicable or requested.
 - c. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
 - d.. A statement indicating the substitution's effect on the Contractor's Construction Progress Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - e. Cost information, including a proposal of the net change, if any in the Contract Sum.
 - f. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Construction Contract Documents. Include the Contractor 's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
3. Owner's Action: Within one (1) week of receipt of the request for substitution, the Owner may request additional information or documentation necessary for evaluation of the request. Within two (2) weeks of receipt of the request, or one (1) week of receipt of the additional information or documentation, whichever is later, the Owner will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance will be in the form of a Change Order.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Conditions: The Contractor's substitution request will be received and considered by the Owner when one or more of the following conditions are satisfied, as determined by the Owner, otherwise requests will be returned without action except to record noncompliance with these requirements.
1. Extensive revisions to Construction Contract Documents are not required.
 2. Proposed changes are in keeping with the general intent of the Construction Contract Documents.
 3. The request is timely, fully documented and properly submitted.
 4. The request is directly related to an "or equal" clause or similar language in the Construction Contract Documents.
 5. The specified product or method of construction cannot be provided within the Contract time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
 6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
 7. A substantial advantage is offered the Owner in terms of cost, time, energy conservation or other considerations of merit after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Architect / Engineer of record for redesign, increased cost of other construction elements by the Owner or other separate Contractors, and similar considerations.

8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
 9. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
 10. The specified product or method of construction cannot provide a warranty required by the Construction Contract Documents and where the Contractor certifies that the proposed substitution will provide the required warranty.
- B. The Contractor's submittal and the Owner's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.
- C. Substitution request constitutes a representation that the Contractor:
1. Has investigated the proposed product and determined that it meets or exceeds, in all respects, the product specified.
 2. Will provide the same warranty for substitution as for the product specified.
 3. Will coordinate installation and make other changes, which may be required for work to be complete in all respects.
 4. Waives claims for additional costs, which may subsequently become apparent. All costs associated with the substitution will be paid for by the Contractor regardless of approvals given, and regardless of subsequent difficulties experienced as a result of substitutions.

PART 3 - EXECUTION

Not Used

END OF SECTION 01600

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SECTION 01610

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall comply with and be responsible for all requirements of the Project Manual, without exception.
- B. The Contractor shall comply with the applicable requirement in this Section, and the requirements of Division 1, Section 01100 Summary of Work.
- C. Division 1, Section 01600, Product Requirements.
- D. Division 1, Section 01770, Closeout Procedures

1.02 RELATED WORK

- A. Division 1, General Requirements of the Project Manual.

1.03 SCOPE

- A. General storage and protection of project materials and equipment.
- B. Furnish, install and maintain storage sheds as required for protection of materials and equipment. Remove at completion of Work.
- C. Exterior storage requirements for all specified materials and equipment requiring protection.

1.04 MATERIAL AND EQUIPMENT INCORPORATED INTO WORK

- A. Comply with applicable specifications, manufacturer's recommendations and standards.
- B. Comply with size, make, type and quality specified or as specifically accepted in writing by the Owner.
- C. Design, fabricate, assemble deliver and install products in accordance with engineering and shop practices normal to trade.
- D. Manufacture like parts of duplicate units to standard interchangeable sizes and gauges. Two or more items of same kind shall be identical by same manufacturer.
- E. Products shall be suitable for intended purpose.
- F. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically accepted in writing.

- G. Do not use material or equipment for any purpose other than for which it is designed or is specified.

1.05 IDENTIFICATIONS AND NAMEPLATES

- A. Nameplates, trademarks, and other identifying marks on manufactured and fabricated items are not permitted on surfaces exposed to view in public spaces, including elevators and escalators except as noted otherwise in the Construction Contract Documents. This does not apply to UL labels.

1.06 QUALITY ASSURANCE

- A. Materials specified are to define standard of quality or performance and to establish basis for evaluation of proposals.
- B. Comply with individual Technical Specification Sections and referenced standards as minimum requirements.
- C. Components required to be supplied in quantity within a Technical Specification Section shall be of same manufacturer and shall be interchangeable, unless otherwise required.

1.07 PRODUCT OPTIONS

- A. For Products specified only by reference standard, select Product meeting that standard by any manufacturer.
- B. For Products specified by naming only one Product and manufacturer, select any one of the products and manufacturers named which complied with the Technical Specifications.
- C. For products specified by naming only one Product and manufacturer, there is no option and no substitution will be allowed.

1.08 PRODUCTS LIST

- A. Within twenty (20) calendar days after award of Contract, submit to the Owner three (3) copies of complete list of major Products, which are proposed for installation.
- B. Tabulate Products by Technical Specification Section number and title.
- C. For products specified only by reference standards list for each such Product:
 - 1. Name and address of manufacturer.
 - 2. Trade name.
 - 3. Model or catalogue designation.
 - 4. Manufacturer's data:
 - a. Reference standards.
 - b. Performance test data.
- D. The Owner will coordinate with the Architect / Engineer of record and reply in writing stating whether there is reasonable objection to listed items. Failure to object to a listed item shall not constitute a waiver of the requirements of the Construction Contract Documents.

1.09 MANUFACTURER'S INSTRUCTIONS

- A. When Construction Contract Documents require installation of work to comply with manufacturers printed instructions, obtain and distribute copies of instructions to parties involved in installation, including two (2) copies to the Owner, prior to commencing work.
- B. Maintain one (1) set of complete instructions at job site during installation and until work is complete.
- C. Maintain copies for Project Record Documents.
- D. Handle, install, connect, clean, condition and adjust products in strict accord with manufacturer's instructions and in conformity with specified requirements.
- E. Should job conditions or specified requirements conflict with manufacturer's instructions, notify the Owner in writing for further instructions. Do not proceed with Work without clear instructions.
- F. Perform Work in accordance with manufacturer's instructions. Do not omit preparatory steps on installation procedures unless specifically modified or exempted by the Contract Documents.

1.10 TRANSPORTATION AND HANDLING

- A. Arrange deliveries of materials and equipment in accordance with construction schedules. Coordinate to avoid conflict with Work and conditions at Site. Avoid congesting traffic.
- B. Deliver materials and equipment in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
- C. Immediately upon delivery, inspect shipments to assure compliance with requirements of the Construction Contract Documents and accepted submittals, and that products are properly protected and undamaged.
- D. Promptly remove unsatisfactory materials from Site.
- E. Furnish equipment and personnel to handle products by methods necessary to prevent soiling or damage to products or packaging.

1.11 STORAGE

- A. Store materials subject to damage from exposure to weather in weather tight storage facilities of suitable size with floors raised above ground. Materials not subject to weather damage may be stored on blocks off ground.
- B. Store fabricated products in accordance with manufacturer's instructions, seals and labels intact and legible. Store product subject to damage by elements in weather tight enclosures. Maintain temperature and humidity within ranges required by manufacturer's instructions.
- C. Cover materials, which are subject to deterioration with breathable, impervious sheet covering to provide adequate ventilation to avoid condensation.
- D. Store loosed granular materials in well-drained area on solid surfaces to prevent mixing with foreign matter and cover during inclement weather. Store cementitious and clay products clear of earth or concrete floors, away from walls.

- E. Arrange storage in manner to permit easy access for inspections.
- F. Protect metal from damage, dirt or dampness. Furnish flat, solid support for sheet products during storage.
- G. Make periodic inspections of stored materials to verify that products are maintained under specified conditions and are free from damage or deterioration.
- H. Do not use materials in work that have deteriorated, become damaged or are otherwise unfit for use.
- I. Store paints in assigned room or area kept under lock and key. Prevent mixing of refuse or chemically injurious materials or liquids with stored materials.
- J. Remove oil, rags and other combustible materials daily and take precautions to prevent fire hazard.
- K. Do not load structure during construction by storing materials with load greater than structure is calculated to support safely. Such storage is subject to approval by the Owner.
- L. Provide substantial platforms, blocking, or skids to support fabricated products above ground; slope to provide drainage. Provide surface drainage to prevent erosions and pounding of water.
- M. Pipe and conduit stored outdoors shall have open ends sealed to prevent entrance of dirt, moisture, etc.

1.12 PROTECTION AND MAINTENANCE

- A. Furnish protection against weather. Cover building openings and penetrations to protect interior of building from weather.
- B. Maintain work, materials, apparatus and fixtures free from damage, accumulation of debris, and protected from dust and dirt.
- C. Protect items having factory finish to prevent damage to finish and equipment.
- D. At end of day's work, cover new work likely to be damaged or otherwise protect and necessary.
- E. After installation, secure substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations.
- F. Remove protection where no longer needed. Upon completion of Work, remove storage facilities from site.
- G. Contractor shall replace, at no additional cost to the Owner, stored items damaged by inadequate protection and environmental control.
- H. For mechanical and electrical equipment in long-term storage, provide manufacturer's service instructions shown on exterior of package.

- I. Service equipment on a regular basis as recommended by manufacturer. Maintain log of maintenance services; submit log as Project Record Document in accordance with requirements of Section 01781, Project Record Documents.
- J. After cabinets and boxes are installed, cover openings to prevent entrance of water and foreign materials. Close conduit openings with temporary metal or plastic cap, including those terminated in cabinets.
- K. Provide temporary enclosures for equipment such as substations and motor control centers. Provide and maintain heat in closures until equipment is energized, to avoid condensation damage.

1.13 MANUFACTURER CERTIFICATION

- A. Prior to Final Acceptance of Work, for items designated in Technical Specifications Sections, an authorized representative of each manufacturer of materials and/or equipment installed under the work of that Section, shall personally inspect installation and operation of his/her materials, system and equipment to determine they are correctly installed and operating properly as follows:
 - 1. Inspection and testing shall be accomplished:
 - a. For Work which will be concealed during execution of Work, after completion of installation and prior to concealment.
 - b. For Work which will not be concealed, at completion of Work.
 - 2. Each representative shall submit a signed statement to the Owner through the Contractor certifying to his personal inspection and to the correct installation and proper operation of materials, systems and/or equipment. Their certification shall list all items included.
 - 3. Contractor shall transmit all such certifications to the Owner at or prior to Final Acceptance Inspection. Transmittal shall include a list of all certifications included.

PART 2 - PRODUCTS

2.01 MATERIALS, EQUIPMENT & FURNISHINGS

- A. Materials and equipment intended for use in Project must be new. Equipment and furnishings utilized for installation of material and equipment in the Project may be new or used, but must be serviceable, must be adequate for intended purpose, and must not violate applicable codes and/or regulations.

PART 3 - EXECUTION

3.01 GENERAL

- A. Store products immediately upon delivery at location acceptable to the Owner, in accordance with manufacturer's storage instructions, with seals and labels intact. Protect until uninstalled.
- B. Arrange storage in manner to provide access for maintenance of stored items and for inspection.

3.02 MAINTENANCE OF STORAGE

- A. Verify that storage facilities comply with manufacturer's product storage requirements.
- B. Verify that manufacturer required environmental conditions are maintained continually.
- C. Verify that surfaces of products to elements are not adversely affected and that any weathering of finishes is within acceptable tolerances under requirements of Construction Contract Documents.

END OF SECTION 01610

SECTION 01620

STORAGE AND PROTECTION

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. General storage and protection of project materials and equipment.
- B. Furnish, install and maintain storage sheds as required for protection of materials and equipment. Remove at completion of Work.
- C. Exterior storage requirements for all specified materials and equipment requiring protection.

1.02 RELATED REQUIREMENTS

- A. Division 1, General Requirements in the Project Manual without exception..

PART 2 – PRODUCTS

2.01 MATERIALS, EQUIPMENT & FURNISHINGS

- A. Materials and equipment intended for use in Project must be new. Equipment and furnishings utilized for installation of material and equipment in the Project may be new or used, but must be serviceable, must be adequate for intended purpose, and must not violate codes or regulations.

PART 3 – EXECUTION

3.01 GENERAL

- A. Store products immediately upon delivery at location acceptable to the Owner, in accordance with manufacturer's storage instructions, with seals and labels intact. Protect until installed.
- B. Arrange storage in manner to provide access for maintenance of stored items and for inspection.

3.02 ENCLOSED STORAGE

- A. Store products subject to damage by elements in substantial weather tight enclosures or storage sheds of adequate dimensions.
- B. Maintain temperature and humidity within ranges stated in manufacturer's instruction.
- C. Provide humidity control and ventilation for sensitive products as required by manufacturer's instruction.
- D. Store unpacked and loose products on shelves, in bins, or in neat groups of like items.
- E. Contractor shall replace, at no additional cost to the Owner, store items damaged by inadequate protection or environmental control.

- F. Provide substantial platforms, blocking, or skids to support fabricated products above ground; slope to provide drainage.
- G. For products subject to dislocation or deterioration from exposure to elements, cover with impervious sheet materials. Provide ventilation to prevent condensation below covering.
- H. Store loose, granular materials on clean, solid surfaces, or on rigid sheet materials, to prevent mixing with foreign matter.
- I. Provide surface drainage to prevent erosion and pounding of water.
- J. Prevent mixing of refuse or chemically injurious materials or liquids with stored material.
- K. Pipe and conduit stored outdoors shall have open ends sealed to prevent entrance of dirt, moisture, etc.

3.03 MAINTENACE OF STORAGE

- A. Periodically inspect stored products on a scheduled basis.
- B. Verify that storage facilities comply with manufacturer's product storage requirements.
- C. Verify that manufacturer required environmental conditions are maintained continually.
- D. Verify that surfaces of products exposed to elements are not adversely affected and that any weathering of finishes is within acceptable tolerances established by the applicable manufacturer.

3.04 MAINTENACE OF EQUIPMENT STORAGE

- A. For mechanical and electrical equipment in long-term storage, provide manufacturer's service instructions shown on exterior of package.
- B. Service equipment on a regular basis as recommended by manufacturer. Maintain log of maintenance services; submit log in accordance with requirements of Section 01781, Project Record Documents

3.05 PROTECTION OF INSTALLED EQUIPMENT

- A. After cabinets and boxes are installed, cover openings to prevent entrance of water and foreign materials. Close conduit openings with temporary metal or plastic cap, including those terminated in cabinets.
- B. Provide temporary enclosures for equipment such as substations and motor control centers. Provide and maintain heat in closures until equipment is energized, to avoid condensation damage.

END OF SECTION 01620

SECTION 01700

EXECUTION REQUIREMENTS

PART 1- GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Contractor shall comply with and be responsible for all of the requirements of the Project Manual without exception.
- B. Contractor shall provide field engineering and general layout services required on the project as follows:
 - 1. Civil, structural or other professional engineering services specified, or required to execute construction methods consistent with the requirements of the Construction Contract Documents.
 - 2. Survey work required for execution of the total Work.
 - 3. Continuous horizontal and vertical control regarding layout and execution of Work.
 - 4. Coordinate field engineering services with the Owner.

1.02 RELATED REQUIREMENTS

- A. Division 1, General Requirements of the Project Manual without exception.
- B. The Technical Specifications, Sections 0200 through 1900, as may be applicable.

1.03 CONTROLS

- A. Contractor will establish primary controls, horizontal and vertical control points at various locations at the Site. These will be described and indicated on the Contractor's approved Drawings and will be coordinated in the field by the Contractor.
- B. Existing control points and property line markers will be shown on the Owner's survey drawings.

1.04 QUALIFICATIONS OF SURVEYOR OR ENGINEER

- A. For Surveying, a qualified engineer or registered land surveyor, registered in the State of South Carolina and acceptable to the Owner.
- B. For engineering, a registered professional engineer of a discipline required for this Project licensed in the State of South Carolina and acceptable to the Owner.

1.05 SURVEY REFERENCE POINTS

- A. Existing horizontal and vertical control points for the Project are those designated on Owner's survey drawings or as determined from investigation of the existing conditions.
- B. Verify property, grades, lines, levels and dimensions indicated.

- C. Locate and protect control points prior to starting Site Work and preserve permanent reference points during construction.
 - 1. Make no changes or relocations without prior approval of the Owner
 - 2. Report to the Owner when a reference point is lost, destroyed or requires relocation because of necessary changes in grades or locations.
 - 3. Require surveyor to replace Project control points, which may be lost or destroyed.

1.06 PROJECT LAYOUT REQUIREMENTS

- A. Establish a sufficient number of permanent bench marks on Site, as may be required, referenced to data established by survey control points. Record locations of benchmarks with horizontal and vertical data on Project Record Documents, Section 01781.
- B. From established control points, Contractor shall layout all Work by establishing all lines and grades at Site necessary to control Work, and shall be responsible for all measurements that may be required for execution of Work.
- C. Furnish, at own expense, all such stakes, steel pins, equipment, tools and material and labor that may be required in laying out Work control points.
- D. Establish lines and levels, locate and layout by instrumentation and similar appropriate means:
 - 1. Site Improvements
 - a. Stakes for grading, fill, and topsoil placement.
 - b. Utility slopes and invert elevations.
 - c. Limits of pavement (concrete and asphalt).
 - 2. Batter boards for structures.
 - 3. Building foundation column locations, piling and floor levels.
 - 4. Controlling lines and levels required for mechanical and electrical trades.
- E. Verify and coordinate in field all existing and proposed underground components including civil, structural, utilities and other components prior to initiation of the Work. Advise the Owner of any conflicts or discrepancies.

1.07 SUBMITTALS AND DOCUMENTS

- A. Submit name and address of Surveyor and Professional Engineer assigned to the Project to the Owner.
- B. On request of the Owner, submit documentation to certify accuracy of field engineering work and compliance with Construction Contract Documents.
- C. Submit certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance, or non-conformance, with Construction Contract Documents.
- D. Standards and Availability: Data and other measurements shall be recorded in accordance with standard and approved methods. All field notes, sketches, recordings, and computation in establishing above horizontal and vertical control points shall be available at all times during progress of Work for ready examination by the Owner

- E. Maintain complete and accurate record data on underground utilities and obstructions, new and existing, encountered in execution of Work. Record data on Project Record Documents in accordance with requirements of Section 01781, Project Record Documents.
- F. On completion of all foundation walls, pavement and other major site improvements, prepare certified survey showing dimensions, locations, angles, and elevations of construction.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01700

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SECTION 01710

FINAL CLEANING

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Contractor shall comply with and be responsible for all requirements of the Project Manual, without exception.
- B. Contractor shall comply with applicable requirements in this Section and more specific requirements in Section 00800, Special Project Conditions, and Section 01100, Summary of Work.
- C. Execute final cleaning at completion of the Work as required by the Construction Contract Documents.

1.02 RELATED REQUIREMENTS

- A. Divisions 1, General Requirements in the Project Manual without exception.

1.03 DISPOSAL REQUIREMENTS

- A. Conduct cleaning and disposal operations to comply with all applicable codes, ordinances, regulations, and anti-pollution laws.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.
- C. Using cleaning materials only on surfaces recommended by cleaning material manufacturer.
- D. Refer to applicable manufacturer's recommendations for specific products and materials.

PART 3 – EXECUTION

3.01 FINAL CLEANING

- A. Execute prior to inspection at Substantial Completion.
- B. Employ skilled workmen or professional cleaners for the final cleaning.
- C. In preparation for substantial completion or occupancy, conduct final inspection of sight-exposed interior and exterior surfaces, and of concealed spaces, and clean as follows:
 - 1. Remove grease, dust, dirt stain, labels, fingerprints, and other foreign materials from site-exposed interior and exterior surfaces; wash and polish surfaces so designated to shine finish.

2. Repair, patch and touch-up marred surfaces to specified finish, to match adjacent surfaces.
- D. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.
 - E. Clean roof areas of debris; flush roof drainage system(s) with water until clear.
 - F. Prior to final completion, or Owner occupancy, Contractor and Owner shall conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas, to verify that the entire Project Work area is clean.
 - G. Leave Project Work area clean and ready for use and occupancy.

END OF SECTION 01710

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SECTION 01770

CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall comply with and be responsible for all of the requirements of the Project Manual, without exception.
- B. The Contractor shall comply with applicable requirements in this Section and more specific requirements in Division 1, Section 01100, Summary of Work.
- C. The Contractor shall comply with the requirements stated in the Construction Contract and in approved and permitted Drawings and Technical Specifications for the Work.

1.02 RELATED REQUIREMENTS

- A. Conditions of the Construction Contract: fiscal provisions, legal submittals and additional administrative requirements.
- B. Division 1, General Requirements in the Project Manual without exception.
- C. Closeout submittals required of trades as may be indicated in various sections of the approved Technical Specifications.

1.03 DAMAGES

- A. If the Contractor neglects, fails, or refuses to complete the work by the Substantial Completion Date, Final Completion Date, or any portion of the Work by an Interim Completion Date, subject to any proper extension granted by the Owner, then the Contractor will pay, or cause the Contractor's Surety to pay damages to the Owner as defined in Summary of the Work, Section 01100.

1.04 PHASED COMPLETION

- A. In addition to Substantial Completion (Beneficial Occupancy) and Final Completion as defined below, the Contractor shall complete and make available to the Owner certain portions of the Work set forth on the Summary Schedule and Key Milestones in Section 00750 no later than the dates indicated on said Schedule ("Interim Completion Date")
- B. The Contractor acknowledges that such Interim Completion Dates are essential to the Owner's plans and use and, therefore, time is of the essence in meeting said Interim Completion Dates.

1.05 SUBSTANTIAL COMPLETION

- A. When Contractor considers the Work is substantially complete, he shall submit to the Owner the following:
 - 1. The Owner shall be notified by the Contractor once the Work is substantially complete (when all the punch list items have been addressed).

2. The Owner will schedule an inspection within ten (10) calendar days of the notification.
- B. After Work is substantially complete, Contractor shall:
1. Complete Work listed for completion or correction within designated form.
 2. Perform all cleaning in accordance with Section 01710, Final Cleaning.

1.06 FINAL COMPLETION

- A. Within ten (10) calendar days after substantial completion, the Contractor shall submit to the Owner written certification that:
1. Construction Contract Documents have been reviewed.
 2. Work has been examined for compliance with Construction Contract Documents.
 3. Work has been completed in accordance with Construction Contract Documents.
 4. Equipment and systems have been tested in the presence of the Owner and the appropriate County personnel, and are operational.
 5. Work is completed and ready for final examination.
 6. Submittal of Closeout Documents as stipulated in paragraph 1.07 below.
- B. The Owner will make an examination to verify the status of completion within ten (10) calendar days after receipt of such certification.
- C. Should the Owner consider the Work incomplete or defective, or the Contractor has not demonstrated to the Owner that a “good faith” effort has been made within the time (72 hours) allotted in paragraph 1.05 A above, any Damages and/or Liquidated Damages, will be charged against the Contractor as defined and explained in Section 01100, Summary of Work
1. The Owner will promptly notify the Contractor in writing of all deficiencies listing the incomplete or defective work.
 2. Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written Certification to the Owner that the Work is complete.
 3. The Owner will re-examine the Work.
- D. When the Owner concludes that the Work is complete, the Owner shall determine the number of days for which Liquidated Damages will be assessed and request the Contractor to prepare closeout submittals.
- E. Acceptance of the entire project shall commence after all contract work is complete, final inspections are made, corrective actions completed, the Work re-examined, and after final acceptance by the Owner
- F. The date established by the Owner as the Final Completion Date shall initiate the guarantee and the warranty periods for all system components and the construction of the Project. The Project

shall not be considered Final Complete until all Close Out Documents are properly completed and transmitted to the Owner.

- G. The Owner shall review the status of the Work and compare it to the request for final payment and payment and compare it with the Project records for conformance to the final settlement requirements.
- H. The Owner shall receive from the Contractor, and maintain, the permit drawings and specification package, copy of all shop drawings and submittals, the “as-built” set of drawings (unless waived by the Owner) and specifications, maintenance manuals as required by the contract and submitted by the Contractor. In addition, the Contractor shall provide spare parts and supplies, stored materials, special tools, filters, and other pertinent items as required under the Construction Contract Documents to the Owner for transmittal to the appropriate County department(s)

1.07 CLOSEOUT SUBMITTALS

- A. Evidence of compliance with requirements of governing authorities:
 - 1. Certificates of Inspection:
- B. Project Record (Permit) Documents, in accordance with Section 01781
- C. Operating and Maintenance Data, in accordance with Section 01782
- D. Warranties and Bonds, in accordance with Section 01790.
- E. Spare Parts and Maintenance Materials, in accordance with Section 01785.
 - 1. Provide products, spare parts, and maintenance materials in quantities specified in each approved Specification Section in addition to that required for completion of Work.
- F. Certificate of Insurance for Products and Completed Operations.

1.08 EVIDENCE OF PAYMENTS AND RELEASE OF LIENS

- A. Contractor s Affidavit of Release of Liens.
 - 1. Consent of Surety to Final Payment. Use form acceptable to the Owner
 - 2. Contractor’s Release or Waiver of Liens. Standard Form “Affidavit and Partial Lien Waiver”. Use form acceptable to Owner.
 - 3. Separate releases of waivers of liens from prime and subcontractors, suppliers and others with lien rights against property of the Owner together with a list of those parties, in accordance with Standard Form “Affidavit and Final Lien Waiver”. Use form acceptable to Owner.
- B. All submittals shall be duly executed and notarized before delivery to the Owner.

1.09 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final Statement of Accounting to the Owner.
- B. Statement shall reflect all adjustments to the Contract Sum:

1. The original Contract Sum.
 2. Additions and deductions resulting from:
 - a. Previous Change Orders.
 - b. Allowances.
 - c. Unit Prices.
 - d. Deductions for uncorrected Work.
 - e. Deductions for liquidated damages.
 - f. Other adjustments.
 3. Total Contract Sum, as adjusted.
 4. Previous payments.
 5. Sum remaining due.
- C. The Owner will prepare a final Change Order reflecting approved adjustments to the Contract Sum, which was not previously made by Change Orders.

1.10 FINAL APPLICATION FOR PAYMENT

- A. Contractor shall submit final Application for Payment in accordance with procedures and requirements stated in the Construction Contract and Section 01290, Payment Procedures of the Project Manual.

1.11 ADDITIONAL ADJUSTMENT

- A. No adjustments to the Construction Contract requested by the Contractor will be allowed if asserted after execution of Final Payment of Contract.

1.12 POST-CONSTRUCTION INSPECTION

- A. Prior to expiration of one (1) year from the Date of Final Completion, the Owner, or its designated representative, will make visual inspection of the Project Work in the company of the Contractor to determine whether further correction of Work is required in accordance with the provisions of the Construction Contract. The Contractor shall be responsible for contacting the Owner and scheduling and coordinating the one (1) year inspection.
- B. The Owner will notify the Contractor, in writing, of any observed deficiencies.
- C. Contractor shall contact the Owner to arrange convenient time and establish schedule for correction of deficiencies.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01770

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SECTION 01781

PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.01 REQUIRED INCLUDED

- A. Contractor shall comply with and be responsible for all requirements of the Project Manual without exception.
- B. Contractor shall comply with the applicable requirements in this Section and more specific requirements in: Section 00800, Special Project Conditions; Section 01100, Summary of Work; Section 01330, Submittal Procedures; Section 01322, Photographic Documentation; and Section 01770, Close Out Procedures.
- C. Contractor shall conform to the requirements of the Owner, Georgetown County, and such other federal, state and municipal agencies having jurisdiction.

1.02 RELATED REQUIREMENTS

- A. Division 0, Bidding and Contract Documents, in the Project Manual without exception.
- B. Division 1, General Requirements in the Project Manual without exception.

1.03 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. For duration of Project, maintain at job Site the following:
 - 1. One copy of the Drawings, Technical Specifications, Addenda, shop drawings, products data, miscellaneous requested submittal data, Change Orders and other modifications to Contract, field orders, field test or written instructions.
 - 2. One copy of transmittal letters.
 - 3. One set of construction photographs.
 - 4. One set of samples.
 - 5. One copy of Permit Drawings as may be required by the appropriate governing agency having jurisdiction.
- B. Store documents and samples in Permit Box apart from documents used for construction.
- C. File documents and samples in accordance with CSI 16-division format.
- D. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- E. Make documents and samples available at all times for inspection by the Owner.
- F. Incomplete or out of order documents and samples will be grounds for not approving the Design/Builder's Application for Payment.
- G. Provide felt tip marking pens for recording information in color code designated by the Owner.

- H. Label each document “PROJECT RECORD” in neat large printed letters. Keep record documents current. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.

1.04 RECORD DRAWINGS

- A. Unless waived by the Owner, electronic data “As-Built” record drawings shall be required. The Owner will select electronic format and software to be used by Contractor.
- B. Permanent and Accurate Record Drawings shall be created on full size sheets (24 in. x 36 in. ft.) capable of being reproduced. These shall be made from the approved, original drawings, which shall be provided to a commercial reprographics service at an appropriate time. All of the aforementioned shall be at the Contractor’s sole cost and expense.
- C. Legibly mark in color code designated by the Owner to record actual construction on designated Record Drawing prints:
 - 1. Depths of various elements of structure(s) foundations in relation to finish first floor datum.
 - 2. Horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements.
 - 3. Location of all internal utilities and appurtenances and features of the structure(s), including dimensional locations of underground activities and other work
 - 4. Dimensional locations, vertical and horizontal, of site work, including utilities.
 - 5. Dimensional location, vertical and horizontal, of asphalt and concrete pavement.
 - 6. Dimensional location, vertical and horizontal, of storm water drainage system including pipe invert elevations.
- D. Indicate the following installed conditions:
 - 1. All electrical systems, plumbing and mechanical systems and such other units installed requiring periodic maintenance or repair.
 - 2. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
 - 3. Approved substitutions, contract modifications, and actual equipment and materials installed.
 - 4. Field modifications with dimensions and details.
 - 5. Modifications made by addenda, clarifications, Field Orders or Change Orders.
 - 6. Details not on original, approved Construction Contract drawings.
 - 7. Record information on a daily basis, or as often as necessary.
 - 8. Include references to related shop drawings and modifications.
- E. Contractor shall retain competent drafting services, as necessary, for transfer of “mark-up notations” from information recorded during construction.
- F. Contractor shall submit Record Documents drawings to the Owner for review and acceptance thirty (30) days prior to final closeout.
- G. Make revisions and additions as may be indicated by the Owner.
- H. Do not use these Drawings for reference or construction, nor allow them to leave the field office.

1.05 RECORD SPECIFICATIONS AND ADDENDA

- A. Legibly mark up in color code designated by the Owner each Specification Section to record the following:
 - 1. Manufacturer, trade name, catalog name and supplier (with address and phone number) of each product and item of equipment actually installed.
 - 2. Modifications made by Change Order.
 - 3. Other matters not originally specified.

1.06 RECORD SAMPLES

- A. Record in transmittal, if not indicated, manufacturer, trade name, catalog number.

1.07 SUBMITALLS

- A. At Contract closeout, Contractor shall sign each final Record Drawing and cover of Record Specifications stating documents are complete and accurate, deliver project Record Documents to the Owner.
- B. Accompany submittal with transmittal letter in duplicate, containing:
 - 1. Date.
 - 2. Owner RFP / Bid Number.
 - 3. Contractor's name and address.
 - 4. Title and number of each Record Document.
 - 5. Signature of Contractor or his/her authorized representative.
- C. Submit the following quantities of Record Documents:
 - 1. Two (2) complete and full sets of Project Record Drawings.
 - 2. Two (2) complete sets of "Up-Dated" Technical Specifications
 - 3. A complete set of Project Record Drawings in electronic format to be determined by Owner.

1.08 BURDEN OF ACCURACY

- A. Contractor shall bear all costs of damages of any nature incurred by the Owner due to inaccuracies or incompleteness of the submitted Project Record Documents.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01781

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SECTION 01790

WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS

- A. Division 0, Bidding and Contract Documents of the Project Manual without exception.
- B. Division 1, General Requirements of the Project Manual without exception.
- C. Approved Technical Specifications as applicable and required.

1.02 SUMMARY

- A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Construction Contract Documents, including manufacturer's standard warranties on products and special warranties.
 - 1. Refer to the applicable requirements of Division 0 and Division 1 for Contractor's special warranty of workmanship and materials.
 - 2. General closeout requirements are included in Section 01770, Closeout Procedures.
 - 3. Specific requirements for warranties for the Work and products and installations that are specified to be warranted, are included in the individual and applicable Sections of the Technical Specifications.
 - 4. Certifications and other commitments and agreements for continuing services to the Owner, Georgetown County, South Carolina are specified elsewhere in the Construction Contract Documents.
- B. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products.

1.03 WARRANTY REQUIREMENTS

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Construction Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
- D. Owner Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

- E. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Construction Contract Documents.
- F. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to counter sign such commitments are willing to do so.

1.04 SUBMITTALS

- A Submit written warranties to the Owner prior to the date certified for Substantial Completion. If the Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Owner.
- B When a designated portion of the Work is completed and occupied or used by the Owner by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Owner within ten (10) calendar days of completion of that designated portion of the Work.
- C When a special warranty is required to be executed by the Contractor, or the prime and a subcontractor, supplier or manufacturer prepare a written document that contains appropriate terms and identification, ready for execution by the required parties, Contractor shall submit a draft to the Owner for approval prior to final execution.
- D Form of Submittal: At Final Completion, the Contractor shall compile two (2) copies of each required warranty and bond properly executed by the Contractor, or by the prime, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
- E Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.
- F Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.
- G Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS, the Project title or name and location, Owner RFP / Bid number and the name of the Contractor.
- H When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS Not Used

PART 3 - EXECUTION Not Used

END OF SECTION 01790
END OF VOLUME 1

VOLUME II - PROJECT MANUAL

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Murrells Inlet Bike Path Parking Lot

Georgetown County, South Carolina

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SECTION 02050 - DEMOLITION AND REMOVAL

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

Do not begin demolition until authorization is received from the Owner. Remove rubbish, debris, landscaping, retaining wall, excess construction materials and etc. as depicted within the approved construction plans from the project site daily; do not allow accumulations on existing pavements or surrounding areas.

1.2 SUBMITTALS

- A. Demolition Plan - Submit proposed demolition and removal procedures to the Owner's Project Manager for approval before work is started.
- B. Required Data - Demolition plan shall include procedures for coordination with other work in progress, a detailed description of methods and equipment to be used for each operation and of the sequence of operations.

1.3 REGULATORY AND SAFETY REQUIREMENTS

Comply with federal, state, and local hauling and disposal regulations.

1.4 DUST AND DEBRIS CONTROL

Prevent the spread of dust and debris and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited, ice, flooding, or pollution.

1.5 PROTECTION

- A. Traffic Control Signs - Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights.
- B. Existing Work - Protect existing work, which is to remain in place, be reused, or remain the property of the Owner. Repair items which are to remain, and which are damaged during performance of the work to their original condition or replace with new. Do not overload pavements to remain.
- C. Facilities - Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades and temporary covering of exposed areas.

1.6 BURNING

Burning will not be permitted.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

- A. Paving - Remove asphaltic concrete paving including aggregate base to a depth of 6 inches minimum or to a depth to accommodate the proposed road section, whichever is greater, below existing adjacent grade. Provide neat sawcuts at limits of pavement removal as indicated.
- B. Patching - Where removals leave holes and damaged surfaces exposed in the finished work, patch and repair these holes and damaged surfaces to match adjacent finished surfaces. Where new work is to be applied to existing surfaces, perform removals and patching in a manner to produce surfaces suitable for receiving new work. Finished surfaces of patched area shall be flush with the adjacent existing surface and shall match the existing adjacent surface as closely as possible as to texture and finish.
- C. Rock Surface - Remove rock surface to a depth of 6 inches minimum or to a depth to accommodate the proposed road section, whichever is greater, below existing adjacent grade.
- D. Landscaping – Remove all existing landscaping within the proposed roadway and parking areas. All other existing landscaping items and plantings must be protected through construction. Any damage incurred during construction must be repaired and or replaced prior to final approvals are granted and no additional cost to the project.
- E. Retaining Wall – Remove all wall components, minimizing damage to private owner’s lot and surrounding property. Coordination of removal must be with private lot owner.

3.2 FILLING

Fill holes and other hazardous openings in accordance with Section 021050 - General Excavation, Filling and Backfilling.

3.3 DISPOSITION OF MATERIAL

- A. Removal of Materials - Except where specified in other sections, all material removed, and not reused, shall become the property of the Contractor and shall be removed from the Owner’s property.
- B. Reuse of Materials - Remove and store materials to be reused or relocated to prevent damage and reinstall as the work progresses.

3.4 CLEANUP

Remove and transport debris and rubbish in a manner that will prevent spillage on pavements, streets or adjacent areas. Clean up spillage from streets and adjacent areas.

END OF SECTION

SECTION 02080 - EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. All Contractors and Subcontractors of the owner/operator whose activities at the construction site may impact storm water discharges or controls at the construction site along the duration of the construction project must sign the SWPPP Plan/Document. A set of these construction plans must be on site at all times for conformance with Stormwater Pollution Prevention Plan documents.
- B. Furnish, install, maintain, and remove temporary erosion and sediment controls as shown or specified on Erosion Control Plans and Details, and as required to control erosion and sedimentation during construction.
- C. Complete on-site inspection reports as required.
- D. The Stormwater Pollution Prevention Plan is not submitted to the EPA for review unless requested. The SWPPP must be available at the construction site from the date of project initiation to the date of final stabilization. The SWPPP and all reports required by the permit must be retained for at least 3 years from the date on which the site is finally stabilized.

Despite the fact that the SWPPP and associated reports are not necessarily required to be submitted with the Notice of Intent, these documents are considered to be reports according to section 308(b) of the Clean Water Act and therefore are available to the public. The permittee, however, may claim certain parts of the SWPPP as confidential according to regulations in 40 CFR Part 2. These regulations state that records which contain trade secrets may be claimed as confidential.

1.2 RELATED SECTIONS

- A. Site Development Plans for the project site.
- B. Section 02050 - Demolition and Removal.
- C. Section 02105 - General Excavation, Filling, and Backfilling.

1.3 REGULATORY REQUIREMENTS

- A. Execute erosion and sediment control during the construction period to conform to applicable SCDHEC/OCRM and Georgetown County codes and requirements.
- B. Notify local authorities and obtain inspections by local authorities having jurisdiction in accordance with SCDHEC/OCRM and Georgetown County requirements.
- C. Pay all Grading Permit fees and bonds required by local agencies having jurisdiction.

PART 2 - MATERIALS

- 2.1 Materials and devices as specified in plans.

PART 3 - EXECUTION

3.1 GENERAL PROCEDURES

- A. Prevent the pollution of land, air and water, and control the erosion, washout and surface runoff of earth and stockpiles materials. Minimize sedimentation generally and sedimentation particularly of the public storm water system and natural drainage channels.
- B. Initiate effective control measures before or in conjunction with the beginning of earthwork at the site.
- C. Place erosion and siltation control measures in locations and construction sequence as shown in plans. Give particular attention to neighboring properties.
- D. Inspect erosion control devices periodically and after each rainfall. Make repairs and clean up the devices within 24 hours after damage in order to maintain effectiveness of the measures.

3.2 CONSTRUCTION PROCEDURES

- A. 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 unless activity in that portion of the site will resume within twenty-one (21) days.
- B. All sediment and erosion control devices shall be inspected every seven (7) days or after each rainfall occurrence that exceeds one-half (0.5) inch. Damaged or ineffective devices shall be repaired or replaced, as necessary.
- C. Provide silt fence and/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.
- D. 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.
- E. The Contractor must take necessary action to minimize the tracking of mud onto the paved roadway from construction areas. The Contractor shall daily remove mud/soil from pavement, as may be required.

- F. Construct and maintain temporary interceptor or diversion ditches, stone outlet structures, sediment traps, sediment basins, stone stabilized areas, silt fencing, rip-rap, and other measures to control erosion prior to, during and after grading.
- G. Clean streets each day of debris carried into public streets from project site.
- H. Protect storm sewer inlets with silt traps. Maintain and modify the traps as necessary during the construction period to provide effective sediment collection and prevent erosion.
- I. Remove sediment periodically from retaining face of silt fences when it collects to more than twelve (12) inches of the top.
- J. Install any additional erosion control measures required by the County, SCDHEC and Engineer's observer during construction at no additional cost to the Owner.
- K. Repair any damages to adjacent properties caused by storm runoff or sedimentation from the project site during construction, at no additional cost to the Owner, within 48 hours of occurrence.
- L. Pay any fines levied by local agencies due to inadequate erosion control during construction.

3.3 STABILIZATION

- A. Within 30 days after rough grading, apply straw or hay mulch and seed for vegetative cover all soil stockpiles, temporary earth berms, diversions and silt dams. Do not leave more than 200 feet of trench open at one time.
- B. Follow completion of curbs and paving with installation as soon as possible of finish grading, permanent sodding or seeding, ground cover or planting and mulching.
- C. Temporary cover grass: If permanent grass species cannot be planted during early stages of project or if season does not permit planting of permanent grass species, seed for temporary vegetative cover as indicated on the plans, at no additional cost to the Owner.

3.4 INSPECTION PROCEDURES

- A. Inspections will be conducted by the responsible person(s) for the Contractor at least once every seven (7) calendar days and with 24 hours after each storm event producing 0.5 inches of rainfall or greater. Areas that have been reseeded will be inspected regularly after seed germination to ensure complete coverage of exposed areas.

The Contractor will designate a qualified person or persons to perform the following inspections:

1. Stabilization measures: Disturbed areas and areas used for storage of materials that are exposed to precipitation will be inspected for evidence of, or the potential for, pollutants entering the drainage system. After a portion of the site is finally stabilized, inspections will be conducted at least once every month throughout the life of the project.

2. Structural controls: Filter fabric fences, straw bale barriers, and all other erosion and sediment control measures identified in the plan will be inspected regularly for proper positioning, anchoring, and effectiveness in trapping sediments. Sediment will be removed from the upstream or upslope side of the filter fabric.
3. Discharge points: Discharge points or locations will be inspected to determine whether erosion control measures are effective in preventing significant amounts of pollutants from entering receiving waters.
4. Construction entrances: Locations where vehicles enter or exit the site will be inspected for evidence of off-site sediment tracking
5. Based on results of the inspection, the site description and control measures of this pollution prevention plan will be revised as appropriate, but in no case later than 7 calendar days following the inspection.
6. A report summarizing the scope of each inspection, name(s) and qualifications of personnel making the inspection, date(s) of the inspection, major observations relating to the implementation of the SWPPP, and actions taken to revise the plan will be completed and retained as part of the SWPPP for at least 3 years from the date that the site is finally stabilized. The report will be signed by the Engineer or his on site construction observation team.

NON-STORMWATER DISCHARGES

- A. It is expected that the following non-stormwater discharges will occur at the site during the construction period:
 - 1. Dewatering discharges: Water pumped from the construction area during dewatering operations (this may or may not be storm water).
 - 2. Pressure test water: Water used to pressure-test the potable water system.
 - 3. Disinfectant water: Water used to disinfect the potable water system.
- B. Dewatering discharges will be done in such a manner as to avoid erosion problems and will pass through a portable sediment tank. If they are released to surface waters, pressure-test water and disinfectant water will be impounded for a sufficient period to allow chlorine to aerate out.

3.5 SPILL PREVENTION AND RESPONSE PROCEDURES

- A. Spill prevention and response include good housekeeping as well as specific practices for certain products and established procedures for responding to spills.
 - 1. Good Housekeeping: The following good housekeeping practices will be followed on site during the construction project.
 - a. Minimize materials: An effort will be made to store only enough material required to do the job.
 - b. Storage: All materials stored on site will be stored in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible, the materials will be covered with polyethylene or polypropylene sheeting to protect them from the elements.
 - c. Labeling: Products will be kept in their original containers with the original manufacturer's label affixed to each container.
 - d. Mixing: Substances will not be mixed with one another unless this is recommended by the manufacturer.
 - e. Disposal: Whenever possible, all of a product will be used prior to disposal of the container. Manufacturers' recommendations for proper use and disposal will be followed.
 - f. Inspections: The site superintendent will inspect the site daily to ensure proper use and disposal of materials on site.
 - g. Spoil materials: Any excavated earth that will not be used for fill material and all demolished pavement will be hauled off site immediately and will be disposed of properly.

2. Product-specific practices

- a. Petroleum products: All on-site vehicles will be monitored for leaks and will receive regular preventive maintenance to reduce the chance of leakage. If petroleum products will be present at the site, they will be stored in tightly sealed containers which are clearly labeled. Any asphalt substances used on site will be applied according to the manufacturer's recommendations.
- b. Concrete trucks: Concrete trucks will be allowed to wash out and/or discharge surplus concrete or drum wash water in the area that is listed as the washout area on the construction plans.
- c. Paints: All containers will be tightly sealed and stored when not required for use. Excess paint will not be poured into the storm sewer system but will be properly disposed of according to manufacturers' instructions or state and local regulations.
- d. Fertilizers: Fertilizers will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. The fertilizer will be stored in a covered area, and any partially used bags will be transferred to a sealable plastic bin to avoid spills.

B. Spill control and response practices

- 1. A spill prevention and response team will be designated by the site superintendent. In addition, the following practices will be followed for spill cleanup:
 - a. Information: Manufacturers' recommended methods for spill cleanup will be clearly posted, and site personnel will be made aware of the procedures and location of the information and cleanup supplies.
 - b. Equipment: Materials and equipment necessary for spill cleanup will be present on the site at all times. Equipment and materials will include but not be limited to brooms, shovels, rags, gloves, goggles, absorbent materials (sand, sawdust, etc.), and plastic or metal trash containers specifically designed for this purpose. The materials and equipment necessary for spill cleanup will be dependent upon the nature and quantity of the material stored on site.
 - c. Response: All spills will be cleaned up immediately upon discovery.
 - d. Safety: The spill area will be kept well ventilated, and personnel will wear appropriate protective clothing to prevent injury from contact with hazardous substances.
 - e. Reporting: Spills of toxic or hazardous material (if present on site) will be reported to the appropriate state or local government agency, regardless of the spill's size.

- f. Record keeping: The spill prevention plan will be modified to include measures to prevent this type of spill from recurring as well as improved methods for cleaning up any future spills. A description of each spill, what caused it, and the cleanup measures used will be kept with the plan.

3.6 COMPLETION

- A. Do not remove temporary control measures until removal is acceptable to the Engineer.
- B. Remove temporary control materials and devices when no longer needed after the construction of permanent site improvements has proceeded to a point to permit removal.
- C. Fill in temporary sediment basins at end of project when acceptable to the Engineer or the Engineer.

PART 4 PAYMENT

4.1 METHOD OF MEASUREMENT

- A. Site erosion and sediment control shall be measured by the number of items installed in accordance with this specification. Payment shall be full compensation for all labor, materials, tools, equipment, and incidentals required to complete the work as specified herein and on the drawings.

END OF SECTION

SECTION 02105 - GENERAL EXCAVATION, FILLING, AND BACKFILLING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Soil Materials.
- B. Surface Preparation.
- C. Excavation, Filling and Backfilling.
- D. Sampling and Testing.

1.2 RELATED SECTIONS

- A. Section 02400 - Asphaltic Concrete Pavement.
- B. Section 02805 - Seeding and Sodding.

1.3 REFERENCES

- A. ASTM C 33 - Concrete Aggregates
- B. ASTM C 136 - Sieve Analysis of Fine and Coarse Aggregates
- C. ASTM D 698 - Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft)
- D. ASTM D 1140 - Amount of Material in Soils Finer Than the No. 200 Sieve
- E. ASTM D 1556 - Density and Unit Weight of Soil in Place by the Sand-Cone Method
- F. ASTM D 1557 - Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft)
- G. ASTM D 2321 - Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
- H. ASTM D 2487 - Classification of Soils for Engineering Purposes
- I. ASTM D 2922 - Density of Soil and Soil-Aggregate in Place by Nuclear Methods
- J. ASTM D 3017 - Water Content of Soil and Rock in Place by Nuclear Methods
- K. ASTM D 4318 - Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- L. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances

1.4 DEFINITIONS

- A. Cohesive Materials - Materials ASTM D 2487 classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesive only when the fines have a plasticity index greater than zero.
- B. Cohesionless Materials - Materials ASTM D 2487 classified as GW, GP, SW, and SP. Materials classified as GM and SM will be identified as cohesionless only when the fines have a plasticity index of zero.

1.5 SUBMITTALS

- A. Fill and backfill test.
- B. Select material test.
- C. Density tests.

1.6 DELIVERY, STORAGE, AND HANDLING

Perform in a manner to prevent contamination or segregation of materials.

1.7 FIELD MEASUREMENT

Verify that spot survey benchmark and intended elevations for the work are as indicated and that pipes or other artificial obstructions, except those indicated, will not be encountered.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

Free of debris, roots, wood, scrap material, vegetation, refuse, soft unsound particles, and frozen, deleterious, or objectionable materials. Unless specified otherwise, the maximum particle diameter shall be one-half the lift thickness at the intended location.

- A. Common Fill - Approved, unclassified soil material with the characteristics required to compact to the soil density specified for the intended location.
- B. Backfill and Fill Material - ASTM D 2487, classification GW, GP, GM, GC, SW, SP, SM, with a maximum ASTM D 4318 liquid limit of 35, maximum ASTM D 4318 plasticity index of 12, and a maximum of 20 percent by weight passing ASTM D 1140, No. 200 sieve.
- C. Topsoil - Natural, friable soil representative of productive, well-drained soils in the area, free of subsoil, stumps, rocks larger than one inch diameter, brush, weeds, toxic substances, and other material detrimental to plant growth.
- D. Select Material - ASTM D 2487, classification GW, GP, GM, SW, SP, SM, with a maximum of 15 percent by weight passing ASTM D 1140, No. 200 sieve.

2.2 BORROW

- A. Obtain borrow materials required in excess of those furnished from excavations from sources outside of Owner's property.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

3.1.1 Clearing and Grubbing

- A. Unless indicated otherwise, remove trees, stumps, logs, shrubs, and brush within the clearing limits. Remove stumps entirely. Grub out matted roots and roots over 2 inches in diameter to at least 18 inches below existing surface.

3.1.2 Stripping

- A. Strip existing topsoil to its full depth without contamination by subsoil material. Stockpile topsoil separately from other excavated material and locate convenient to finish grading areas.

3.1.3 Unsuitable Material

Remove vegetation, debris, decayed vegetable matter, sod, mulch, and rubbish underneath paved areas, concrete slabs, and foundations.

- A. Proof Rolling - Proof rolling shall be done on an exposed subgrade free of surface water (wet conditions resulting from rainfall) which would promote degradation of an otherwise acceptable subgrade. After stripping, proof roll the existing subgrade of the building and paved areas with six passes of a 15-ton, pneumatic-tired roller. Operate the roller in a systematic manner to ensure the number of passes over all areas, and at speeds between 22 to 32 miles per hour. When proof rolling under buildings, the building subgrade shall be considered to extend 5 feet beyond the building lines, and one-half of the passes made with the roller shall be in a direction perpendicular to the other passes. Notify the Engineer a minimum of 3 days prior to proof rolling. Proof rolling shall be performed in the presence of the Engineer. Rutting or pumping of material shall be undercut and replaced with fill and backfill material.

3.2 PROTECTION

3.2.1 Drainage and Dewatering

- A. Provide for the collection and disposal of surface and subsurface water encountered during construction.

3.2.2 Drainage

- A. So that construction operations progress successfully, completely drain construction site during periods of construction to keep soil materials sufficiently dry. Provide temporary ditches, swales, and other drainage features and equipment as required to maintain dry

soils. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein.

3.2.3 Dewatering

- A. Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in-situ material. While the excavation is open, the water level shall be maintained continuously, at least 3 feet below the working level.

3.2.4 Underground Utilities

- A. Location of the existing utilities indicated is approximate. The Contractor shall physically verify the location and elevation of the existing utilities indicated prior to starting construction. The Contractor shall contact Palmetto Utility Location Service at 811 (www.sc811.org) for assistance in locating existing utilities.

3.2.5 Machinery and Equipment

- A. Movement of construction machinery and equipment over pipes during construction shall be at the Contractor's risk. Repair, or remove and provide new pipe for existing or newly installed pipe that has been displaced or damaged.

3.3 EXCAVATION

- 3.3.1 The term Aexcavation@ used hereinafter is defined as Aunclassified excavation. Excavation of every description, regardless of material encountered within the grading limits of the project, shall be performed to the lines and grades indicated. Satisfactory excavated material shall be transported to and placed in the fill areas within the limits of the work. When directed by the Engineer, unsatisfactory material encountered within the limits of the work shall be excavated below the grade shown and replaced with satisfactory material. The unsatisfactory soils shall be removed to a depth required and filled with backfill and fill materials that will provide a firm, unyielding subgrade at the specified density. Unless specified otherwise, compact fill and backfill materials to 98 percent of ASTM D 698 maximum density. Surplus excavated material not required for fill shall remain the property of the Owner and shall be stockpiled in a designated area on the property. Excavated material which is not suitable for use as fill, shall be disposed of by the Contractor off of the Owner's property as part of the contract price. During construction, excavation and filling shall be performed in a manner and sequence that will provide drainage at all times.

Excavate to contours, elevation, and dimensions indicated. Reuse excavated materials that meet the specified requirements for the material type required at the intended location. Keep excavations free from water. Excavate soil disturbed or weakened by Contractor's operations, soils softened or made unsuitable for subsequent construction due to exposure to weather. Refill with backfill and fill material and compact to 98 percent of ASTM D 698 maximum density. Unless specified otherwise, refill excavations cut below indicated depth with backfill and fill material and compact to 98 percent of ASTM D 698 maximum density.

All areas covered by the project, including excavated and filled sections and adjacent transition areas, shall be uniformly smooth graded. The finished surface shall be reasonably smooth, compacted and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from either blade grader or scraper operations. The finished surface shall be not more than 0.1 foot above or below the established grade or approved cross section.

All vegetation, roots, brush, rubbish and other unsatisfactory or surplus material stripped or removed from the limits of construction shall be hauled off the Owners property and disposed of by the Contractor as part of the contract price.

3.3.2 Pipe Trenches

- A. Excavate to the dimension indicated. Grade bottom of trenches to provide uniform support for each section of pipe after pipe bedding placement.

3.3.3 Ponds and Ditches

- A. Ponds and ditches shall be cut accurately to the cross sections and grades indicated by the drawings. All roots, stumps and other foreign matter in the sides and bottom of the ditches and ponds shall be cut 18 inches below the grades indicated. The Contractor shall be responsible for maintaining these newly constructed features and take immediate action to keep erosion of the ditch bottom and slopes to a minimum during the life of the contract.

3.4 FILLING AND BACKFILLING

- A. Fill and backfill to contours, elevations, and dimensions indicated. Compact each lift before placing overlaying lift.

3.4.1 Common Fill Placement

- A. Place in 8-inch lifts. Compact areas not accessible to rollers or compactors with mechanical hand tampers. Aerate material excessively moistened by rain to a satisfactory moisture content. Finish to a smooth surface by blading, rolling with a smooth roller, or both.

3.4.2 Backfill and Fill Material Placement

- A. Provide for paved areas and under concrete slabs, except where select material is provided. Place in 8-inch lifts. Place backfill material adjacent to structures as the structural elements are completed and accepted. Backfill against concrete only when approved. Place and compact material to avoid loading upon or against the structure.

3.4.3 Trench Backfilling

Backfill as rapidly as construction, testing, and acceptance of work permits. Place and compact backfill under paved areas in 8-inch lifts to top of trench and in 8-inch lifts to one foot over pipe outside paved areas.

- A. Bedding Requirements

Except as specified otherwise in the individual piping section, provide bedding for buried piping in accordance with AWWA C600, Type 4, except as specified herein. Backfill to top of pipe shall be compacted to 98 percent of ASTM D 698 maximum density. Plastic piping shall have bedding to top of pipe. Provide ASTM D 2321 materials as follows:

1. Class I: Angular, 0.25 to 1.5 inches, graded stone, free of shale, friable material, sand and debris.
2. Class II: Coarse sands and gravels with maximum particle size of 1.5 inches, including various graded sands and gravels containing small percentages of fines, generally granular and noncohesive, either wet or dry. Soil Types GW, GP, SW, and SP are included in this class as specified in ASTM D 2487.

3.5 COMPACTION

- A. Expressed as a percentage of maximum density. Determine in-place density of existing subgrade; if required density exists, no compaction of existing subgrade will be required.

3.5.1 General Site

- A. Compact underneath areas designated for vegetation and areas outside the 5-foot line of the structure to 90 percent of ASTM D 698.

3.5.2 Paved Areas

- A. Compact top 12 inches of subgrades to 98 percent of ASTM D 698. Compact fill and backfill material to 98 percent of ASTM D 698.

3.5.3 Adjacent Areas

- A. Compact areas within 5 feet of structures to 98 percent of ASTM D 1557.

3.6 FINISH OPERATIONS

3.6.1 Grading

- A. Finish grades as indicated within one-tenth of one foot. Grade areas to drain water away from structures. For existing grades that will remain but were disturbed by Contractor's operations, grade as directed.

3.6.2 Protection of Surfaces

- A. Protect newly graded areas from traffic, erosion, and settlements that may occur. Repair or reestablish damaged grades, elevations, or slopes.

3.6.3 Disposition of Surplus Material

- A. Remove from Owners property, surplus or other soil material not required or suitable for filling or backfilling, and brush, refuse, stumps, roots, and timber.

3.7 FIELD QUALITY CONTROL

3.7.1 Sampling

A. Take the number and size of samples required to perform the following tests.

3.7.2 Testing - Perform one of each of the following tests for each material used. Provide additional tests for each source change.

A. Fill and Backfill Material Testing - Test fill and backfill material in accordance with ASTM C 136 for conformance to ASTM D 2487 gradation limits; ASTM D 1140 for material finer than the No. 200 sieve; ASTM D 4318 for liquid limit and for plastic limit; ASTM D 698 or ASTM D 1557 for moisture density relations, as applicable.

B. Select Material Testing - Test select material in accordance with ASTM C 136 for conformance to ASTM D 2487 gradation limits; ASTM D 1140 for material finer than the No. 200 sieve; ASTM D 698 or ASTM D 1557 for moisture density relations, as applicable.

C. Density Tests - Test density in accordance with ASTM D 2922 and ASTM D 3017. Test each lift at randomly selected locations every 2500 square feet for fill areas and every 2000 square feet of subgrade in cut.

END OF SECTION

SECTION 02400 - ASPHALTIC CONCRETE PAVEMENT

PART 1- GENERAL

1.1 SECTION INCLUDES

- A. Aggregate Base and Asphaltic Concrete Pavement.
- B. Sampling and Testing.

1.2 RELATED SECTIONS

- A. Section 02105 - General Excavation, Filling, and Backfilling.
- B. Section 02460 - Thermoplastic Pavement Markings.

1.3 REFERENCES

- A. SCDOT SS - South Carolina State Highway Department Standard Specifications, latest edition.
- B. The Federal Highway Administration Manual on Uniform Traffic Control Devices for Streets and Highways, 2000 Edition.
- C. ASTM D 1188 - Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Paraffin-Coated Specimens
- D. ASTM D 1556 - Density of Soil in Place by the Sand-Cone Method
- E. ASTM D 1557 - Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft)
- F. ASTM D 2726 - Bulk Specific Gravity of Compacted Surface-Dry Specimens
- G. ASTM D 2922 - Density of Soil and Soil-Aggregate in Place by Nuclear Methods
- H. ASTM D 3017 - Moisture Content of Soil and Rock in Place by Nuclear Methods

1.4 QUALITY ASSURANCE

- A. Except as specified herein or as indicated, work and materials shall be in accordance with the SCDOT SS. The provisions therein for method of measurement and payment do not apply.
- B. Obtain materials from same source throughout.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not produce or place asphaltic concrete when the weather is rainy or foggy, when the base course is frozen or has excess moisture, or when the ambient temperature is less than 40 degrees F in the shade away from artificial heat.

1.6 SUBMITTALS

- A. Job-Mix Formula: Submit the mix design, including mixing temperature, for approval. The mix design shall include a certified laboratory analysis of mix composition with marshall stability value, void content, and flow. After mix design approval, job mixes shall conform to the range of tolerances specified in SCDOT SS. Obtain acknowledgment of receipt prior to asphaltic concrete placement. Submit additional data regarding materials if the source of the materials changes.

- B. Certificates

- 1.1 Base course

1.7 BARRICADES AND SIGNALS

- A. Provide and maintain temporary signs, signals, lighting devices, markings, barricades, and channelizing and hand signaling devices in accordance with the South Carolina Manual on Uniform Traffic Control Devices for Streets and Highways to protect personnel and new construction from damage by equipment and vehicles until the surface is approved by the Engineer.

1.8 WARRANTY

- A. Contractor shall provide an unconditional maintenance free warranty in writing for all asphaltic concrete paving against defects in workmanship and materials for a period of one (1) year. The warranty period shall begin at the date the final pay request is approved. The warranty shall be executed by the paving subcontractor and cosigned by the General Contractor.
- B. Condition at Expiration of Warranty Period: At his own expense and just before expiration of the one (1) year warranty period, the Contractor shall make such repairs as may be necessary to produce a pavement which shall:
 - 1. Have a contour substantially conforming to that of the pavement indicated on the drawings, and free from depressions of any kind exceeding 1/8" deep as measured between any points 4 feet apart on a line conforming substantially to the original contour of the paved area.
 - 2. Be free from cracks or depressions showing disintegration of the surface mixture.
 - 3. Contain no disintegrated surface mixture.
 - 4. Not have been reduced more than 3/8" in thickness in any part.

5. Have a base free from cracks or defects which will cause its disintegration or settling of the pavement.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Bituminous Concrete Mix: SCDOT SS, Section 402 and 403, Type C for surface course; Type C for intermediate course.
- B. Base Course: SCDOT SS, Section 305.
- C. Prime: SCDOT SS, Section 406, MC-30, RC-30 or EA-P.

2.2 MIX PLANT

- A. SCDOT SS, Section 401, Type C.

PART 3 - EXECUTION

3.1 INSTALLATION AND APPLICATION

- A. Provide a base course with a prime coat and a bituminous concrete surface course.

3.2 BASE COURSE PLACEMENT

- A. Begin spreading base material at the point nearest the source of supply. Permit traffic and hauling over the base. Fill ruts formed by traffic and reroll. After base course placement, continue machining and rolling until surface is smooth, compacted, well bonded, and true to the designed cross section. Compact to 100 percent ASTM D 1557 maximum dry density. Maintain the base smooth and true to grade and cross section until asphaltic concrete placement.
- B. The completed thickness of the base course shall be within +3/4 inch or -1/2 inch of the required thickness. The average thickness shall not be less than the design thickness.

3.3 APPLICATION OF PRIME COAT

- A. The prime coat shall not be applied until the stabilized aggregate base course has seasoned sufficiently to permit a uniform penetration. The base shall be dry when the prime is applied.
- B. The rate of application shall be from 0.25 to 0.30 gallons per square yard.
- C. When it is necessary to maintain traffic on a road or a section of road before the prime coat has time to sufficiently dry to prevent pickup, the Contractor shall apply sand as a cover. The cost of the material and performing this work shall be included in the cost of the base course or other items of work and no direct payment will be made.

3.4 PLACING ASPHALTIC CONCRETE PAVEMENT

- A. Placing Temperature - Minimum temperature of asphaltic concrete during placement into mechanical spreader shall be 250 degrees F. Mixtures which have a lower temperature shall be rejected.
- B. Joints - Where new pavement abuts existing bituminous pavement, cut existing surface course along straight lines approximately 6 inches from edge. Cuts shall be vertical and extend full depth of surface course. Prior to bituminous concrete placement, apply asphalt cement to exposed edges of cold joints.
- C. Spreading and Finishing Equipment - Spread the bituminous concrete to a uniform density and produce a smooth finish, true to cross section and free from irregularities. Provide adjustable screeds to shape the surface to true cross section.
- D. Asphaltic Concrete Placement - As continuous as possible. Place in maximum 2-inch lifts. Avoid passing rollers over unprotected edges of bituminous concrete prior to bituminous concrete cooling. If rollers pass over unprotected edges of bituminous concrete prior to cooling, cut bituminous concrete back to expose full depth of bituminous concrete. Immediately prior to resumption of bituminous concrete placement, coat exposed edges of bituminous concrete with asphalt cement. When bituminous concrete placement resumes, rake the hot bituminous concrete against asphalt cement and compact.
- E. Featheredges - Accomplish featheredging by raking out the larger aggregate as necessary and sloping the pavement uniformly throughout the featheredge to create a smooth transition. Unless indicated otherwise, featheredge transition shall be 10 feet.
- F. Compaction - SCDOT SS for equipment and compaction procedures, modified to compact bituminous concrete to 96 percent of maximum laboratory density. Finished surfaces shall be uniform in texture and appearance and free of cracks and creases.
- G. Protection - No vehicular traffic shall be allowed on pavement for a minimum of 6 hours after final rolling, or until asphaltic concrete has cured, whichever is longer.

3.5 TOLERANCES OF PAVEMENT

- A. Flatness: Maximum variation of 1/4 inch measured with a 10-foot straight edge.
- B. Compacted Scheduled Thickness: Within -1/4 inch to +1/2 inch of design thickness.

3.6 FIELD QUALITY CONTROL

- A. Sampling: Provide new materials where samples are taken. Take the number and size of samples required to perform the following tests.
 - 1. Bituminous Concrete Sampling
 - a. Job Mix: Take one initial sample and one sample for every 400 tons or fraction thereof.

- b. Thickness: Take one sample for every 500 square yards or fraction thereof.
 - c. Density: One field test for every 1000 square yards or fraction thereof, and one laboratory test for the project. Provide minimum 4-inch diameter cores.
 - 2. Base Course Sampling
 - a. Thickness: Take one sample for every 500 square yards or fraction thereof.
 - b. Density: One field test for every 250 square yards or fraction thereof, plus two (2) tests, minimum, at each street area to receive concrete pavers and one laboratory test for the project.
 - B. Testing: Provide for each sample.
 - 1. Bituminous Concrete Testing
 - a. Job Mix: Determine gradation and bitumen content.
 - b. Thickness: Maximum allowable deficiency shall be 1/4 inch less than the indicated thickness.
 - c. Density, In Place: ASTM D 2922 and ASTM D 3017; cored sample ASTM D 1188 or ASTM D 2726.
 - 2. Base Course Testing
 - a. Thickness: Maximum allowable deficiency shall be 1/2 inch less than the indicated thickness.
 - b. Density: ASTM D 1556 or ASTM D 2922 and ASTM D 3017.

END OF SECTION

SECTION 02410 - PATCHING ASPHALTIC CONCRETE PAVEMENT

PART I - GENERAL

1.1 SECTION INCLUDES

- A. Patching of existing asphalt pavements or asphalt resurfaced pavements for water lines, sewer lines, storm drains lines or utility service lines.

1.2 RELATED SECTIONS

- A. Section 02105 - General Excavation, Filling and Backfilling.
- B. Section 02500 - Storm Drainage System.

1.3 REFERENCES

- A. SCDOT Standard Specifications, latest edition.
- B. SCDOT Manual of Uniform Traffic Control Devices for Streets and Highways, latest edition.
- C. SCDOT Work Zone Safety Handbook, March 1995 Edition.

1.4 QUALITY ASSURANCE

- A. Perform work in accordance with the SCDOT standards.
- B. Obtain materials from same source throughout.

1.5 TESTING REQUIREMENTS

- A. Submit proposed mix design of each class of mix for review prior to commencement of work.

1.6 SUBMITTALS

- A. Certificates: Provide certificates stating that materials supplied comply with the specifications. Certificates shall be signed by asphalt producer and Contractor.
- B. Mix Design: Submit mix design for base and pavement courses to Engineer for acceptance.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Construct asphaltic courses only when atmospheric temperature is above 40 degrees F, when underlying base is dry and when weather is not rainy.
- B. Conform to SCDOT Standard Specifications except where more stringent requirements are specified herein.

- C. Apply bituminous prime and tack coats only when the ambient temperature in the shade has been at least 60 degrees F. for 12 hours immediately prior to application.
- D. Place concrete only when atmospheric temperature is above 40 degrees F.

PART 2 - PRODUCTS

2.1 PAVEMENT MATERIALS

- A. Primer: Homogeneous medium curing liquid asphalt. Type MC-30.
- B. Tack Coat: Type SS-1.
- C. Asphalt Cement: ASTM D946. Type AC-20.
- D. Aggregate for Mix: SCDOT Type 1.

2.2 ASPHALT PAVING MIX

- A. Use dry materials to avoid foaming. Mix uniformly.
- B. Topping Course: 4.8 to 6.8 percent of asphalt cement by weight in mixture.

2.3 BASE COURSE MATERIAL

- A. The base course material shall be as specified on the drawings and shall conform to the SCDOT Standard Specifications.

2.4 CONCRETE

- A. Concrete and reinforcing steel shall conform to requirements of Section 03250 - Concrete.
- B. Concrete shall be 3500 psi high early strength.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify compacted trench backfill is dry and ready to support a compacted base course.
- B. Verify compacted base course is dry and ready to support paving and imposed loads.
- C. Verify that reinforcing steel is lean, of the proper size, properly positioned and free from kinks or other defects before pouring concrete (for patches requiring concrete base).
- D. Verify that the concrete base (where required) has set up for the proper length of time before covering patch with asphalt.

3.2 TRENCH BACKFILLING

- A. The trench shall be backfilled and compacted in accordance with Section 02105 - General Excavation, Filling and Backfilling.
- B. All trenches across roadways shall be covered at the end of each working day and open to traffic.
- C. Trenches shall be brought level with the existing pavement using gravel base for at least the top 6 inches which shall be compacted in place. Any settlement or holes which develop shall be promptly filled by the Contractor at his expense with additional gravel base.
- D. Pavement patch shall be brought level with the existing pavement using gravel base for at least the top 6 inches which shall be compacted in place. Any settlement or holes which develop shall be promptly filled by the Contractor at his expense with additional gravel base.

3.3 PATCH PREPARATION

- A. The existing pavement shall be sawcut at the required distance from the edge of the trench just prior to the final application of gravel base or concrete as called for on the plans.
- B. Immediately after saw cutting the existing pavement as described above the patch area shall be cleaned of extraneous material. The area shall be cleared to the required depth in neat lines and all excess material shall be removed.
 - 1. For patches to receive gravel base, the final application of gravel shall be made and compacted to bring the level up to the required distance below the existing pavement.
 - 2. For patches with concrete base the reinforcing steel (if required) shall be placed in the patch area and supported by concrete block, brick or approved chair supports the proper distance above the sub-base. Reinforcing steel shall not be allowed to rest on the sub-base. After the steel placement has been inspected and approved, concrete shall be poured and the top troweled to an even surface at the required depth below the existing pavement.
 - 3. Concrete shall be allowed to set at least 24 hours. During this time traffic shall be maintained by placing steel plates or other approved or bridging material across the trench. Such bridging shall be at the Contractor's expense.
- C. Traffic shall not be allowed to cross the sawcut edges until the final asphalt course has been laid.

3.4 PLACING ASPHALT PATCH

- A. The asphalt surface shall be placed as soon as practical after the patch preparation is finished.

- B. Prior to placing the asphalt, a primer shall be used if placed over a gravel base. A tack coat shall be used if placed over concrete and shall be used between layers if more than one layer is required. Such primer or tack coat shall be at the Contractor's expense.
- C. Place the asphalt within 24 hours of priming the base or placing the tack coat.
- D. Place the asphalt to the compacted thickness identified on the plans.
- E. Compact pavement by rolling. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
- F. Develop rolling pattern with consecutive passes to achieve required compaction and even and smooth finish, without roller marks.
- G. Asphalt pavement shall meet all SCDOT requirements unless otherwise stated on the plans or in the specifications.

3.5 TOLERANCES

- A. Compaction and Density Requirements:
 - 1. Base and sub-base: Compact to 98% as measured by ASTM D698.
 - 2. Asphalt Pavement: Minimum acceptable density of in place material shall be 98% of recorded laboratory specimen density.
- B. Allowable Variation in Thickness:
 - 1. Base Course: (+\-) 1/2".
 - 2. Surface (wearing) Course: (+\-) 1/8".
- C. Surface Smoothness: Test finished surface of each asphalt course for smoothness using a 10'-0" straight edge. Intervals of tests shall be as directed by the Engineer. Surfaces will not be acceptable if exceeding the following:
 - 1. Base Course: 1/2" in 10'-0".
 - 2. Surface (wearing) Course: 1/4" in 10'-0".
- D. Laboratory shall test in place courses for compliance with specified density, thickness and surface smoothness. Contractor shall seek Engineer's approval for testing locations and number of tests.
- E. Laboratory shall take two 4" diameter cores per 1,000 sq. yards of paved surface (400 LF of roadway) at locations directed by the Engineer.
- F. Contractor's duties relative to testing shall include:
 - 1. Notifying laboratory of conditions requiring testing.

2. Coordinating with Engineer and laboratory for field testing.
3. Paying costs for testing performed and for retesting where initial tests reveal nonconformance with specified requirements.
4. Repair holes resulting from coring to match existing surface.

3.6 TRAFFIC CONTROL

- A. Comply with State Manual of Uniform Traffic Devices for Streets and Highways.
- B. Maintain vehicular and pedestrian traffic during paving operations as required for other construction activities. Flagmen may be required at busy intersections.
- C. Provide flagmen, barricades, warning signs and warning lights for movement of traffic and safety and to cause the least interruption of work.

3.7 MARKING AND SIGNAGE

- A. Pavement marking and road signs shall comply with SCDOT and the local municipalities' standards as applicable.

3.8 CLEANING AND PROTECTION

- A. At completion of each operation, remove excess or spilled materials from site. Dump or spread no excess asphalt materials on the project site.
- B. After placement of surface course, no vehicular traffic shall be allowed on pavement until it has cooled.

END OF SECTION

SECTION 02415 - PERVIOUS CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes exterior pervious cement concrete pavement for the following:
 - 1. Parking lots.
 - 2. Pavement markings.

1.2 SUBMITTALS

- A. Product Data: For each type of manufactured material and product indicated.
- B. Design Mixtures: For each pervious concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Qualification Data: Demonstrating compliance with requirements indicated in the "Quality Assurance" paragraph below.
 - 1. For pervious concrete manufacturer.
 - 2. For pervious concrete contractor.
- D. Concrete Jointing Plan, where a jointing plan has not been provided by the Engineer.
- E. Field quality-control test reports.
- F. Minutes of pre-installation conference.
- G. Test panels: As defined in "Quality Assurance" paragraph below.

1.3 QUALITY ASSURANCE

- A. General: Work shall conform to all requirements of American Concrete Institute document ACI 522.1, "Specification for Pervious Concrete Pavement", except as modified by these Contract Documents.
- B. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with the equipment, material and production requirements of Section 701 of the South Carolina Department of Transportation Standard Specifications for Highway Construction and is a current member in good standing of the Carolinas Ready Mixed Concrete Association, Inc.
- C. Pervious Contractor Qualifications: A qualified pervious concrete Installer whose work has resulted in successful installation of pervious concrete pavements.
 - 1. Experience: Two years' experience in pervious concrete installation, including the verifiably, successful completion of at least five pervious concrete installations of equal or greater scope, in addition to requirements in Division 01 Section "Quality Requirements."

2. Contractor's Field Supervision: Require Contractor to maintain an experienced full-time supervisor on Project site when work is in progress.
 3. Personnel Certifications: At all times when work is in progress and for each placement crew, Contractor's field personnel shall have certifications from the National Ready Mixed Concrete Association (NRMCA) in at least one of the following combinations:
 - a. At least one NRMCA Certified Pervious Concrete Craftsman.
 - b. At least three NRMCA Certified Pervious Concrete Installers.
 4. Pre-Approved Pervious Contractors: These pervious contractors are pre-approved based upon evidence of satisfactory completion of previous projects and have been found to meet or exceed the aforementioned personnel certifications found in Section 1.4.C.3:
 - a. ACE/Avant Concrete Construction, Inc.; Archdale, NC
 - b. Southern Concrete Construction; Anderson, SC
 - c. Construction Perfected, Inc.; North Augusta, SC
 - d. Magruder Construction; Sanford, FL
 - e. Pervious Solutions; Wilmington, NC
 - f. Swederski Concrete and Paving; Gastonia, NC
- D. Concrete Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 and ASTM C 1077 to perform material evaluation tests and to design concrete mixtures.
1. Field testing shall be performed by an individual certified as both an NRMCA Certified Pervious Concrete Technician and an American Concrete Institute (ACI) Concrete Field Testing Technician – Grade 1.
- E. Test Panels: Cast two test panels of pervious concrete pavement, using the manufacturer, mixture proportions, materials, personnel, and equipment as proposed for the Project, to demonstrate strength, porosity, typical joints, surface finish, texture, color, and standard of workmanship.
1. Notify Engineer seven days in advance of dates and times when test panels will be constructed.
 2. Each panel shall have a minimum size of 225 sq. ft. and be full-thickness indicated.
 3. Build test panels in the location indicated or, if not indicated, as directed by Engineer.
 4. Testing: Perform tests as indicated on "Field Quality Control" paragraph below.
 - a. Obtain Engineer's approval of test panels before starting installation of additional concrete.
 - b. Approved test panels may become part of the completed Work if accepted by Engineer and undisturbed at time of Substantial Completion.
 - c. Maintain approved test panels during construction in an undisturbed condition as a standard for judging the completed concrete.
 - d. Demolish and remove rejected test panels, or those subsequently damaged or disturbed, from the site.
- F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."
1. Before submitting design mixtures, review concrete pavement mixture design and examine procedures for ensuring quality of concrete materials and concrete pavement construction practices. Require representatives, including the following, of each entity directly concerned with concrete pavement, to attend conference:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.

- c. Ready-mix concrete producer.
 - d. Pervious concrete contractor.
 - e. Owner's testing agency representative and technician responsible for testing.
 - f. Architect.
 - g. Engineer.
- G. Authorities Having Jurisdiction: Conform to requirements of all authorities having jurisdiction.
- 1. Where conflicts exist between the requirements of the Contract Documents and those of authorities having jurisdiction, the higher quality or more restrictive requirement shall apply.

1.4 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
- 1. Where Work activities encroach into public rights-of-way, provide traffic control to maintain safe transit of work area by vehicular and pedestrian traffic.
 - a. All traffic control shall be in accordance with the requirements of the authorities having jurisdiction.
- B. Environmental Limitations: Do not install pervious concrete paving if subgrade is frozen, wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the ambient air temperature is below, or is expected to fall below, 40 deg F during the time of placement.
- C. Pavement-Marking: Proceed with pavement marking only on clean, dry surfaces; at a minimum ambient or surface temperature of at least 55 deg F, and not exceeding 95 deg F; and at a maximum relative of 85%. Do not apply pavement markings if rain is imminent or expected before time required for adequate drying.
- D. Scheduling and Protection: Plan construction to mitigate potential contamination of pervious pavement surface with sediment from adjoining grounds and vehicular traffic.
- 1. Where practicable, delay installation until as late as possible in the construction sequence to avoid potential for contamination.
 - 2. Implement and maintain protection measures, as indicated in the "Protection" article below, immediately after installation is complete.

PART 2 - PRODUCTS

2.1 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
- 1. Use flexible or curved forms for curves as necessary in order to prevent a chord effect in the alignment of the finished work.

- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 PERVIOUS CONCRETE MATERIALS

- A. Comply with ASTM C 94/C 94M and the following requirements:
 - 1. Aggregate: Selected, hard, and durable; washed; free of materials with deleterious reactivity to cement or that cause staining; from a single source, with gap-graded coarse aggregate as follows:
 - a. Aggregate Sizes: Nominal maximum aggregate size shall not exceed 1/3 of the specified pavement thickness.
 - 2. Admixtures: Air-entraining, accelerating, hydration stabilizing, water reducing and other admixtures that facilitate the production and placement of pervious concrete shall be permitted provided that they do not produce any adverse effect to the strength or longevity of concrete or reinforcement. At a minimum, the mix shall include the following types of admixtures:
 - a. Water reducing admixtures conforming to ASTM C 494 Type A or F
 - b. Air-entraining admixtures
 - c. Viscosity modifying admixtures
 - d. Hydration stabilizing admixtures (if ambient temperature exceeds, or is expected to exceed, 70° F at any time during batching, delivery or placement)

2.3 CURING MATERIALS

- A. Moisture-Retaining Cover: ASTM C 171, polyethylene film, min thickness: 6 mils.
 - 1. Color shall be clear or white during summer months. During cooler weather, black color may be used.

2.4 RELATED MATERIALS

- A. Isolation-Joint-Filler Strips: Shall conform to ASTM D 1751, ASTM D 1752, or ASTM D 994.
- B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- C. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to requirements, and as follows:
 - 1. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.5 PAVEMENT MARKINGS

- A. Pavement-Marking Paint: Reflectorized, heavy metals free, fast drying, waterborne paint for pavement markings in accordance with Section 625 of the South Carolina Department of Transportation Standard Specifications for Highway Construction.

1. Color: As indicated.
- B. Glass Beads: AASHTO M 247, Type 1.

2.6 CONCRETE MIXING

- A. Ready-Mixed Pervious Concrete: Measure, batch, mix and deliver concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.
 1. Discharge shall be complete within 60 minutes of the introduction of mixture water to the cement.
 - a. Increase time to 90 minutes when using an extended set control (hydration stabilizing) admixture.
 2. Water addition is permitted at the point of discharge provided it is performed under the supervision of a qualified, NRMCA Certified member of the placement crew or by a technically qualified employee of the ready-mix concrete producer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas indicated to receive paving, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Confirm that subgrade has been prepared according to requirements in Division 31 Section "Earth Moving". Proof-roll prepared subgrade according to requirements in Division 31 Section "Earth Moving" to identify soft pockets and areas of excess yielding. Proceed with installation only after deficient subgrades have been corrected and are ready to receive pervious concrete paving.

3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
1. Provide joints at location indicated on the Drawings. Where not indicated, provide jointing plan and obtain Architect's approval before initiating concrete placement.
 - a. Contraction joint spacing shall not exceed 20 feet.
 - b. Locate contraction joints at intervals such that the larger horizontal panel dimension shall not exceed the smaller dimension by more than 125%.
 - c. Where the pavement width exceeds 20 feet to a maximum of 40 feet, locate a longitudinal contraction joint along the centerline of the pavement.
 - d. Where the pavement width exceeds 40 feet, locate longitudinal contraction joints at evenly spaced divisions not to exceed 20 feet.
 - e. The angle between two intersecting joints shall be between 80 and 100 degrees.
 - f. Joints shall intersect pavement free edges at 90 degrees and shall extend straight for a minimum of 18" from the pavement edge.
 - g. Align joints with adjoining curbs, where applicable.
 2. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
1. Extend joint fillers full width and depth of joint.
 2. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
 3. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
 4. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- D. Contraction (Control) Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
1. Saw Cut Joints: Saw cut joints are prohibited.
 2. Grooved Joints: Form contraction joints after initial compaction by grooving and finishing each edge of joint with grooving tool to a 1/2-inch radius. Repeat grooving of contraction joints after cross rolling. Eliminate groover marks on concrete surfaces unless indicated to remain.
- E. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete with an edging tool with a radius of not less than 1/4".

3.5 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- D. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
 - 1. Do not allow foot traffic on fresh concrete.
- E. Screed pavement surfaces with a form-riding paving machine, roller screed or vibrating truss-screed. Vibrating hand screeds are not acceptable.
- F. Slip-Form Pavers: When automatic machine placement is used for pavement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce pavement to required thickness, lines, grades, finish, and jointing as required for formed pavement.
- G. When adjoining pavement lanes are placed in separate pours, do not operate concrete installation equipment on placed concrete until it has attained 85 percent of its 28-day compressive strength.
- H. Finish the pavement to the elevations and thickness indicated and to meet the tolerances indicated below.
 - a. Do not use steel trowels or power finishing equipment.
- I. Cold-Weather Placement: Comply with ACI 306.1, recording concrete temperature no less than twice per 24-hr period. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. Concrete operations shall not be undertaken when air temperature has fallen to or is expected to fall below 40 deg F.
 - 2. Do not use frozen materials or materials containing ice or snow.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.
- J. Hot-Weather Placement: See ACI S22.1 and S3.11.1 when hot-weather conditions exist:
 - 1. Fog-spray forms and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.6 FINAL SURFACE TEXTURE

- A. Compact fresh concrete to the elevations and thickness indicated and to meet the tolerances indicated below.

- B. Compact concrete with either a manually operated roller applying approximately 40 lb/lf of force, or with a hydraulic roller keeping a consistent head of concrete across the entire roller.
 - 1. Sod rollers are prohibited.
- C. Compact concrete along the slab edges with hand tools being sure not to drag tool across the surface so as not to seal the surface.
- D. Compact concrete to a dense, pervious surface.

3.7 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from vehicular or foot traffic, premature drying, and excessive cold or hot temperatures.
- B. Begin curing within 20 minutes of concrete discharge.
- C. Curing Method: Cure concrete by penetrating sealer and moisture-retaining-cover curing.
 - 1. Penetrating Sealer: The contractor shall use a penetrating sealer consisting of no less than 27% soybean oil and manufactured per U.S. Patent number 5,647,899. The sealer shall be spray applied at a rate of 200-300 sq.ft./gallon. The sealer shall be applied directly following the finish pass of the roller and before plastic is placed on the concrete.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Secure curing cover material without using dirt.
 - b. Cover shall be a minimum 6 mil thick white or clear polyethylene sheet.
- D. Cure pavement for a minimum of 7 uninterrupted days; 10 days if using supplementary cementitious materials.

3.8 PAVEMENT TOLERANCES

- A. Comply with the following:
 - 1. Elevation: +3/4 inch., -0"
 - 2. Thickness: Plus 1-1/2" inch, minus 1/4 inch.
 - 3. Surface: Gap below 10-foot- long, unlevelled straightedge not to exceed 1/4 inch.
 - 4. Joint Spacing: 3 inches.
 - 5. Contraction Joint Depth: Plus 1/4 inch, no minus.
 - 6. Joint Width: Plus 1/8 inch, no minus.
- B. Mechanically sweep pavement, using like-new, clean sweeping device, before testing for compliance with tolerances.

3.9 PAVEMENT MARKING

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

- B. Sweep and clean surface to eliminate loose material and dust.
- C. Surface shall be dry and free of glaze, oil, dirt, grease or other foreign contaminants.
- D. Apply paint with mechanical equipment for the application of waterborne asphalt paint meeting the requirements of Section 625 of the South Carolina Department of Transportation Standard Specifications for Highway Construction.
 - 1. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.
 - 2. Broadcast glass beads uniformly into wet pavement markings at a rate of 6 lb/gal.
- E. Apply to produce pavement markings of the dimensions indicated; which are straight or of uniform curvature; of consistent width; and with crisp, uniform, edges.
 - 1. The finished line markings shall be free from waviness and the lateral deviations shall not exceed 2 inches in 15 feet.
 - 2. No markings shall be less than the specified width.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Responsible party will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Fresh Concrete Testing: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 - 1. Test density of fresh concrete, in accordance with ASTM C 1688, at the frequencies indicated below. Test results shall be considered acceptable when density measurements are within ± 5 pcf of the approved mix design theoretical density.
 - a. Test Panels: One test for each test panel.
 - b. Final Installation: One test for each 100-cu. yd. or fraction thereof of each concrete mix placed each day.
- C. Hardened Concrete Testing:
 - 1. Core Samples: Obtain drilled cores of hardened concrete in accordance with ASTM C 42 and the following requirements:
 - a. Cores shall be taken not less than 7 days after placement.
 - b. Cores shall be a minimum of 4" in diameter.
 - c. Cores shall be tested for hardened density in accordance with ASTM C 140.
 - d. Cores shall be tested for thickness in accordance with ASTM C 42.
 - e. Cores holes shall be filled with regular concrete or coarse pre-blended grout.
 - f. Test panels:
 - 1) Testing Frequency: Three cores for each test panel.
 - 2) Test results shall be considered the average result of all three cores.
 - a) Acceptable tolerances for thickness shall be +1.5" and -0.25" (with no single core greater than -0.50")
 - b) Calculate and save average hardened density test results for future comparison with final installation test results.
 - g. Final Installation:
 - 1) Testing Frequency: Three cores for each lot of 5,000 sf of placed concrete, to be take at locations determined in accordance with ASTM D 3665.

- 2) Test results shall be considered the average result of all three cores of each 5,000 sf lot.
 - a) Acceptable tolerances for thickness shall be +1.5” and -0.25” (with no single core greater than -0.50”)
 - b) Test results shall be considered acceptable for density when measurements are within $\pm 5\%$ of the approved hardened density measured for the test panels.
- D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, concrete mixture proportions and materials, and test results.
- E. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that requirements have not been met, as directed by Architect.
- F. Remove and replace concrete pavement where test results indicate that it does not comply with specified requirements.
- G. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.
- B. Drill test cores, where directed by Engineer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete.
- C. Protect paving installations from deposition of sediments from adjoining grounds and vehicular traffic.
 - 1. Install and maintain erosion control measures as necessary, at boundaries of paving installations, to prevent migration of sediment onto the pavement surface.
 - 2. Do not allow tracking of mud or debris onto the pavement surface by any vehicle.
 - 3. If deposition of sediment on the paving surface is noted, immediately contact Architect and request instructions for cleaning and repair. Do not delay cleaning efforts as subsequent rainfall events will wash sediments into lower levels of the paving system and worsen potential damage.
- D. Erect and maintain barricades to prevent construction traffic on the paving surface.
 - 1. Provide alternate construction traffic routes to discourage potential use of paving installation by construction traffic.
 - 2. Where alternative construction routes are not available, contact Architect instructions regarding use of pavement for construction access. Implement, monitor, and maintain any specified protection measures.

- E. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Vacuum concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION

SECTION 024200 - CONCRETE CURB AND GUTTER

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Cast-in-place concrete curb and gutter construction.

1.2 RELATED SECTIONS

- A. Section 02105 - General Excavation, Filling, and Backfilling.
- B. Section 02400 - Asphaltic Concrete Pavement
- C. Section 03250 - Concrete.

1.3 REFERENCES

- A. ACI 347 - Recommended Practice for Concrete Form Work.
- B. PS 1 - Construction and Industrial Plywood.

1.4 QUALITY ASSURANCE

- A. Obtain materials from same source throughout.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete in temperatures less than 40 degrees F without Engineer's approval.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Concrete Materials: Comply with requirements of applicable Division 3 sections for concrete materials, curing materials and others as required.
- B. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. Coat forms with nonstaining type coating that will not discolor or deface surface of concrete.
- C. Joint Fillers: Resilient premolded bituminous impregnated fiberboard units complying with ASTM D 1751, FS HH-F-341, Type II, Class A; or AASHTO M 153, Type I.

2.2 MIX DESIGN

- A. Mix design shall comply with requirements of Section 03250.
- B. Design mix to produce normal weight concrete consisting of portland cement, aggregate, water-reducing admixture, air-entraining admixture, and water to produce the following properties:
 - 1. Compressive Strength: 3,000 psi, minimum at 28 days, unless otherwise indicated on Plans.
 - 2. Slump Range: 2" - 4" maximum.
 - 3. Air Entrainment: 5% to 8%.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify reinforcement and other items to be cast into concrete are accurately placed, held securely, and will not cause hardship in placing concrete.

3.2 PREPARATION

- A. Form Construction
 - 1. Set forms to required grades and lines, rigidly braced and secured.
 - 2. Clean forms after each use, coat with form release agent as often as required to ensure separation from concrete without damage.
- B. Concrete Placement
 - 1. Do not place concrete until subgrade and forms have been checked for line and grade.
 - 2. Place concrete using methods which prevent segregation of mix.
 - 3. Automatic machine may be used for curb and gutter placement at Contractor's option. Machine placement must produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete as specified.
- C. Joint Construction
 - 1. Weakened Joints: Provide joints at intervals of 10 feet maximum each way. The joint shall be made by cutting the concrete with a trowel or by other acceptable methods.
 - 2. Expansion Joints: Preformed expansion joints 3/4 or an inch thick, extending the full depth of the concrete curbing, shall be constructed at all radius points,

junctions with existing concrete, inlets and manholes, and at not more than 100-foot intervals in continuous runs of curb.

- D. Place concrete continuously between predetermined expansion joints. Do not break or interrupt successive pours such that cold joints occur.
- E. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.

3.4 FINISHING

- A. Broom finish by drawing fine-hair broom across concrete surface parallel to line of traffic. Repeat procedure if required to provide fine line texture.

3.5 PATCHING

- A. Notify Engineer immediately upon removal of forms.
- B. Patch imperfections.

3.6 DEFECTIVE CONCRETE

- A. Modify or replace concrete not conforming to required levels and lines, details and elevations.
- B. Repair or replace concrete not properly placed or of the specified type.
- C. Remove and replace defective concrete as directed, at no additional cost to the Owner.

3.7 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions described within the SCDOT Standard Specifications.

3.08 PROTECTION

- A. Protect concrete from damage until acceptance of work.

END OF SECTION

SECTION 02421 - CONCRETE SURFACES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Concrete curb, gutter, curb and gutter, sidewalks, and driveways.
- B. Reinforcement.
- C. Surface finish.
- D. Curing

1.2 RELATED SECTIONS

- A. Section 02105 - General Excavation, Filling, and Backfilling.
- B. Section 02400 - Asphaltic Concrete Pavement.
- C. Section 03250 - Concrete.

1.3 REFERENCES

- A. ACI 347 - Recommended Practice for Concrete Form Work.
- B. ASTM A 185 - Welded Steel Wire Fabric for Concrete Reinforcement.
- C. ASTM A 615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
- D. ASTM C 309 - Liquid Membrane - Forming Compounds for Curing Concrete.
- E. PS 1 - Construction and Industrial Plywood.
- F. SCDOT SS - South Carolina Department of Transportation Standard Specifications for Highway Construction, latest edition.

1.4 QUALITY ASSURANCE

- A. Obtain materials from same source throughout.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete in temperatures less than 40 degrees F without Engineer's approval.

1.6 WARRANTY

- A. Contractor shall provide an unconditional maintenance free warranty in writing, for all concrete surfaces including curbs and gutters, sidewalks, and driveways against defects in

workmanship and materials for a period of one (1) year. The warranty period shall begin on the date of the final approval.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portland Cement Concrete: conforming to the requirements of Section 03250.
- B. Forms: Metal, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. Coat forms with nonstaining type coating that will not discolor or deface surface of concrete.
- C. Joint Fillers: Resilient premolded bituminous impregnated fiberboard units complying with ASTM D 1751 and AASHTO M 213.
- D. Welded Steel Wire Fabric: ASTM A 185, plain type, coiled rolls, uncoated finish 6"x6" mesh of 0.135-inch diameter.
- E. Reinforcing Bars: ASTM A 615, 60 ksi yield grade, billet-steel deformed bars with uncoated finish as specified in the Drawings.
- F. Curing Compound: ASTM C 309, Type 1.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify compacted subgrade is ready to support concrete surfaces and imposed loads.
- B. Verify grades and elevations of subgrade are correct. Correct deficiencies in grade, contour, and compaction.
- C. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Moisten subgrade before placement of concrete.

3.3 FORMING

- A. Set forms to required grades and lines, rigidly braced and secured.
- B. Place joint fillers vertical in position, in straight lines. Secure to form work during concrete placement.
- C. Clean forms after each use, coat with form release agent as often as required to ensure separation from concrete without damage.

3.4 REINFORCEMENT

- A. Place reinforcing steel as indicated in the Drawings.
- B. Support reinforcing on metal chairs or spacers to provide 1-1/2 inch clear from top of finish surface unless specified otherwise in the Drawings.
- C. Place wire mesh to provide one full mesh lap at sides, minimum 8 inch at ends.
- D. Interrupt reinforcement at expansion joints.

3.5 CONCRETE PLACEMENT

- A. Do not place concrete until subgrade and forms have been checked for line and grade.
- B. Place concrete using methods which prevent segregation of mix.
- C. Curb extruding equipment may be used in lieu of forms. Machine placement must produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete as directed by the Engineer.
- D. Concrete curb and gutters shall be constructed in 10-foot sections, except where shorter sections are necessary for closures; but no section shall be less than 4 feet in length. The sections shall be separated by steel divider plates full depth.

3.6 CONCRETE WALKS AND DRIVEWAYS

- A. Slope the paving abutting walls and other vertical surfaces away from such structures at not less than 1/8 inch per foot and finish true planes to avoid standing water. Pitch unconfined walks to one side at 1/4 inch per foot.
- B. Thickness: Concrete walks - 4 inches; concrete driveways - 6 inches; unless otherwise noted on the Drawings.
- C. As soon as conditions permit, perform joint work, edging and marking. Score in straight lines and tool neatly. Maintain joint pattern previously established on existing sidewalks.
- D. Finish edges with a radius of 1/4 inch.
- E. Preformed expansion joints shall be 3/4 inch thick placed not over 25 feet apart and where concrete walk abuts a structure or vertical surface. Expansion joints are not required adjacent to curbs.
- F. Score contraction joints at 5-foot intervals in walks and at 10 foot intervals in driveways.
- G. Where sidewalk slabs are more than 10 feet in width, they shall be scored longitudinally in the center. Transverse and longitudinal scoring shall extend for a depth of one inch and shall not be less than 1/4 inch nor more than 1/2 inch in width.

- H. Provide steel trowel finish, followed by brushing with a broom. Brooming shall be transverse to the line of traffic.
- I. Apply curing compound after finishing at a uniform rate of 1 gallon per 400 square feet or control curing by other approved methods such as vapor barrier or misting.
- J. Remove forms when the condition of the concrete permits.

3.7 CURB AND GUTTERS

- A. Provide 3/4-inch-thick expansion joints at intervals of not more than 100 feet.
- B. Provide contraction joints at 10-foot intervals, 1 inch depth tooled joints.
- C. Remove forms as soon as the condition of the concrete permits and perform finishing work on exposed surfaces.
- D. Provide steel trowel finish, followed by brushing with a broom. Brooming shall be transverse to the line of traffic.
- E. Apply curing compound after finishing at a uniform rate of 1 gallon per 400 square feet or control curing by other approved methods such as vapor barrier or misting.
- F. Remove other forms when the condition of the concrete permits.

3.8 PATCHING

- A. Notify Engineer immediately upon removal of forms.
- B. Patch imperfections.

3.9 DEFECTIVE CONCRETE

- A. Modify or replace concrete not conforming to required levels and lines, details and elevations.
- B. Repair or replace concrete not properly placed or of the specified type.
- C. Remove and replace defective concrete as directed, at no additional cost to the Owner.
- D. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.

3.10 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions described within the SCDOT Standard Specifications.

3.11 PROTECTION

- A. Protect concrete from damage until acceptance of work.

END OF SECTION

SECTION 02460 - THERMOPLASTIC PAVEMENT MARKINGS

PART I - GENERAL

1.1 SECTION INCLUDES

- A. Application of permanent thermoplastic reflectorized pavement marking materials and associated permanent raised reflective pavement markers.

1.2 RELATED SECTIONS

- A. Section 02400 - Asphaltic Concrete Pavement.

1.3 REFERENCES

- A. SCDOT Standard Specifications, Latest Edition.
- B. SCDOT Supplemental Specifications.
- C. FHA Manual on Uniform Traffic Control Devices (SCMUTCD).

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Thermoplastic Compound: AASHTO M 249 with the following adjustments:
 - 1. The material may be shipped in the granulated form rather than the block form.
 - 2. For longitudinal long line and channelization markings, the material may be either hydrocarbon or Alkyd based.
 - 3. All handwork consisting of stopbars, crosswalks, legends and symbols shall be Alkyd Based Material only.
- B. Glass Beads: AASHTO M 247 - Type 1.
- C. Primer-Sealer: A primer-sealer as recommended by the manufacturer of the thermoplastic pavement marking material shall be utilized on all Portland Cement pavement surfaces and all bridge surfaces that have not been overlaid with asphalt. The primer-sealer also shall be utilized on any type of pavement prior to the placing of Railroad Crossing Symbols. Primer-sealer shall be used on Asphaltic Concrete pavement surfaces if recommended by the manufacturer of the thermoplastic pavement marking material. The primer-sealer shall form a continuous film which will mechanically adhere to the pavement and shall neither discolor nor cause any noticeable change in the pavement outside of the finished pavement markings.
- D. Retroreflective Pavement Markers (RPM): RPMs shall be provided and installed in accordance with ASTM D 4280 and SCDOT Standard Specifications for Highway Construction (2007 edition) Section 630.

2.2 EQUIPMENT

- A. Requirements: AASHTO M 249 and as expanded by SCDOT Supplemental Specification.

PART 3 - EXECUTION

3.1 PREPARATION OF SURFACE

- A. All surfaces to be painted shall be thoroughly cleaned of all dust, dirt, grease, oil, and all other foreign matter before application of the marking paint.
- B. When waterborne paint is utilized, temperatures at the heat exchanger of the paint truck shall not exceed 150° F (66° C). Paint shall not dwell in the exchanger for more than two hours.
- C. Unless otherwise permitted by the Engineer, no markings shall be applied to areas of pavement when any of the following conditions apply:
 - 1. Any moisture or foreign matter is present on the surface.
 - 2. The air temperature is below 50° F (10° C).
 - 3. The relative humidity is above 85 percent.
- D. All markings shall be sufficiently dry before opening to traffic.
- E. The wet film thickness for all markings shall be 15 mils. Place glass beads at a minimum rate of six (6) pounds per gallon of paint.

3.2 APPLICATION OF THE PRIMER-SEALER

- A. Where used, the primer-sealer shall be sprayed on the pavement surface where the lines are to be applied. The application thickness and curing time on the pavement prior to thermoplastic application shall be governed by the recommendations of the manufacturer of the primer-sealer.

3.3 APPLICATION OF THE MARKING MATERIAL

- A. All longitudinal markings shall be placed with a truck-mounted applicator except when approved by the Engineer. Such a case may occur where the length of a particular marking is too short, or the curvature too great, to permit efficient use of the liner. Transverse markings may be applied with a portable unit.
- B. The markings shall be straight or of uniform curvature and shall conform uniformly with tangents, curves and transitions. Symbols shall be of dimensions shown in the SCMUTCD. Markings must be of the dimensions and placed as shown on the Pavement Marking Plans. The Contractor shall provide, at his own expense, sufficient control points to serve as guides for the application of markings.

- C. The finished line markings shall be free from waviness and the lateral deviations shall not exceed two (2) inches in fifteen (15) feet. Any greater deviation shall be sufficient cause for requiring the Contractor to remove and correct, at his expense, any symbol markings not meeting the dimensional requirements shown in the SCMUTCD.
- D. The Contractor shall protect the markings until dry by placing guarding or warning devices as necessary. In the event any vehicle should cross the wet marking, such a marking shall be reapplied, and any tracking lines made by the moving vehicle shall be removed by the Contractor at no additional expense.
- E. To avoid poor quality, markings shall be placed only when the surface of the pavement is sufficiently dry as determined by visual inspection and the pavement temperature is minimum 55° F and the air temperature is minimum 50° F. No work will be allowed when any moisture is visible on the pavement surface.
- F. Thermoplastic markings to be applied between December 15 and March 15 shall only be applied in the proper weather conditions, as outlined above. The Engineer may disallow application on any days when the weather is cold and/or rainy and there is some question as to whether the surface temperature will be above 55° F for a period of time adequate to obtain quality markings. The Engineer may disallow application on any day when, in the Engineer's opinion, moisture conditions are not satisfactory for obtaining quality markings.
- G. An adequate number of personnel experienced in the handling and application of this type of material shall be provided by the Contractor to assure the work is done properly. Work shall be done only during daylight hours, and all markings shall be sufficiently dry, before sunset, to permit crossing by traffic. All protective devices shall be removed before sunset to allow free movement of traffic at night.
- H. The marking material shall be applied at a temperature that will provide best adhesion to the pavement and shall be between 390° F and 420° F as recommended by the manufacturer. The material shall be heated uniformly throughout and shall have a uniform disbursement of binder, pigment, and glass beads when applied to the surface of the pavement.
- I. All extruded lines 12 inches or less in width shall be applied with a die that equals the width of the line. All extruded lines greater than 12 inches may be applied with two dies whose combined widths equal the width of the line.

3.4 RATE OF APPLICATION

- A. Marking Material: Marking material shall be applied at the specified widths and at a rate to result in a new material thickness at the center of the line as specified below:

90 mils (2.3 mm): Edge lines and median lines
(4-inch solid white, 4 inch solid yellow, 4 inch broken yellow)

90 mils (2.3mm): Lane lines (4 inch broken white)

90 mils (2.3mm): Center lines on two-lane roadways
(4 inch broken yellow and 4 inch solid yellow)

125 mils (3.2mm): All others not listed above.

The edge of the line shall, under all circumstances, have a thickness not less than 75% of the specified center thickness.

- B. Glass Beads: “Drop-on” glass beads shall be mechanically applied to the surface of the marking material immediately after the material is applied to the pavement surface, and while the marking material is still molten to ensure that the beads will be held by and mechanically embedded in the surface of the material. The beads shall be uniformly distributed over the entire surface of the marking and shall be applied at a minimum rate of 12 pounds per 100 square feet of stripe.

3.4 RETROREFLECTIVE PAVEMENT MARKINGS

- A. Markers may be bonded to the pavement by using either the epoxy method or the bituminous adhesive method. Ensure that the ambient temperature and road surface temperature during application is at least 50° F for use of the epoxy method or 40° F for use of the bituminous adhesive method of bonding.
- B. Installation of the RPMs by either method shall be in accordance with the SCDOT SS for Highway Construction, section 630.

3.5 WARRANTY

- A. The Contractor shall transfer to the Owner the warranty on thermoplastic materials issued by the manufacturer. The Contractor shall also furnish the Owner the normal warranty for material for a stated period beginning with the last date of marking application on the project.

3.6 INSPECTION AND ACCEPTANCE OF WORK

- A. All thermoplastic markings shall be inspected for proper line thickness and width, proper adhesion, and proper cycle length. The markings shall also be observed both day and night to determine whether all requirements of the Contract have been met. Any markings failing to have satisfactory appearance, either day or night, shall be reapplied by the Contractor at his own expense.
- B. The final acceptance of the thermoplastic pavement markings will be delayed for a period of one-hundred eighty (180) days after the last date of marking on the project to permit observation of performance. The Contractor shall be required to replace any markings or markers that, in the opinion of the Engineer, have not performed satisfactorily during this one-hundred eighty-day period due to defective materials and/or workmanship in manufacture or application.

END OF SECTION

SECTION 02500 - STORM DRAINAGE SYSTEM

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Storm drainage piping, fittings, and accessories.
- B. Catch basins, junction boxes and drop inlets.
- C. Trench grates as shown on drawings and as specified herein.

1.2 REFERENCES

- A. ANSI/ASTM C76 - Reinforced Concrete Culvert, Storm Drain and Sewer Pipe.
- B. American Association of State Highway and Transportation Officials Specification M-196.
- C. American Association of State Highway and Transportation Officials Specification M-294-94.

1.3 RELATED SECTIONS

- A. Section 02525 - Precast Drainage Structures.
- B. Section 03250 - Concrete.

PART 2 - PRODUCTS

2.1 DRAINAGE PIPE MATERIALS

- A. Reinforced Concrete Pipe: ANSI/ASTM C76, Class III, IV, or V concrete pipe with mesh reinforcement and inside nominal diameter as shown on plans.
- B. Corrugated Aluminum Perforated Pipe: Riveted with circumferential seams 3" x 1", thirty - 3/8" round holes per square foot of pipe surface for the full 360 degrees and inside nominal diameter as shown on plans unless otherwise noted.
- C. Construction Fabric Pipe Wrap: Shall be Mirafi 140 N or approved equal.

2.2 CATCH BASINS, DROP INLETS, JUNCTION BOX FRAMES AND GRATES

- A. Basin Lid and Frame: Cast iron construction, as specified on the plans. All grates are to be bicycle safe.
- B. Manhole castings shall be cast iron meeting ASTM Serial Designation A48-62, Class 30B. They shall be "Anti-Rattle" type.

- C. Shaft construction to be 8" concrete brick or reinforced precast concrete basin sections, lipped male/female dry joints; nominal size, 3 feet square unless shown otherwise on the plans.
- D. Base Pad: Cast-in-place 3000 psi concrete. Level top surface to receive concrete brick or pre-cast concrete section.
- E. All brick or concrete block manholes or catch basins shall have 3/4" grout on outside to seal and waterproof from ground water.

2.3 JUNCTION BOXES

- A. Lid and Frame: Cast iron construction, removable lid, nominal lid and frame diameter of 24 inches as shown on the plans.
- B. Shaft construction to be 8" concrete brick or reinforced precast concrete basin sections, lipped male/female dry joints; nominal size, 3 feet square unless shown otherwise on the plans.
- C. Base Pad: Cast-in-place 3000 psi concrete. Level top surface to receive concrete brick or pre-cast concrete section.
- D. Manholes used as junction boxes shall have the following diameters based upon the largest size pipe:

15" pipe	--	4 feet
18" pipe	--	5 feet
- E. For larger pipes, pre-cast manhole junction boxes must have prior approval of the Engineer.
- F. Pre-cast concrete manholes shall meet ASTM Specifications, Serial Designation C478-64T or latest revision and have "O" ring gasket joints meeting ASTM Specifications, Serial Designation D443-65 or latest revision.

2.4 BRICK

- A. Brick shall meet ASTM Serial Designation C26 for common brick, Grade C.

2.5 CEMENT MORTAR JOINTS

- A. All concrete pipe shall be laid with cement mortar joints. The mortar mixture shall be one-part Portland Cement and two parts clean sand by volume.
- B. Only enough water shall be used to make a stiff, workable mortar and no more than 5.5 gallons of water per sack of cement shall be used.

2.6 CONCRETE MATERIALS

- A. Portland Cement shall conform to Section 03250 - Concrete and the specifications of ASTM, Serial Designation C-150-62 or latest revision.

- B. Cement shall be stored in a weather-tight enclosure.
- C. Hydrated lime shall meet the specifications of ASTM, Serial Designation C207-49, or latest revision.
- D. Fine aggregate shall conform to the following ASTM Specifications, latest revisions:
 - 1. For concrete: Serial Designation C33-66T
 - 2. For masonry mortar: Serial Designation C144-62T
- E. Coarse aggregate for concrete shall consist of crushed granite conforming to the current ASTM Specifications C33. Aggregate shall be cleaned, hard and uncoated.
- F. Water for mortar and concrete must not be contaminated by salt, oil, acid or other material which may be harmful.

2.7 REINFORCING STEEL

- A. Reinforcing steel shall be of the lengths and sizes shown on the plans.
- B. Reinforcing steel shall be of approved deformed type and meet all requirements of ASTM Standard Specifications for new Billet Steel Reinforcement Bars, Serial Designation A150-62T. Bars will be structural or intermediate grade open hearth steel.

2.8 BACKFILL MATERIALS

- A. Reused or imported subsoil as approved by the Project Geotechnical Engineer.
- B. Type B for any pipe crossing beneath roadways.
- C. Type C shall be utilized in areas of poor soil conditions as directed by the Project Geotechnical Engineer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Contractor shall notify Engineer so the trench cut or excavation base can be verified if it is ready to receive work and excavations, dimensions and elevations are as indicated on drawings.
- B. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Hand trim excavations to required elevations. Correct over excavation with fill material of fine aggregate.
- B. Remove large stones or other hard matter which could damage drainage tile or impede consistent backfilling or compaction.

3.3 INSTALLATION - PIPE

- A. Lay pipe to slope gradients noted on drawings with maximum variation from true slope of 1/8 inch in 10 feet.
- B. Increase compaction of each successive lift. Do not displace or damage pipe when compacting.
- C. Storm drainpipe and appurtenant structures shall be installed in accordance with Section 02105 - General Excavation, Filling, and Backfilling.
- D. All pipe shall be laid with the bells uphill.
- E. Clean the pipe ends and wet before the joint is made.
- F. Apply stiff mortar to the lower half of the bell of the pipe already laid and the upper half of the tongue of the pipe to be laid. The joint shall then be made and drawn tight. Bitumastic joints are acceptable.
- G. Additional mortar shall be applied to the outside to fill any unfilled portion of the groove.
- H. Backfill shall be done so as not to disturb the mortar joints.
- I. Fill must be approved by the Engineer before placement.
- J. Spoil from the excavation may not be utilized at these locations unless specifically approved by the Engineer.
- K. In all locations where stormwater drainage pipe crosses beneath roadways, select granular fill shall be used to backfill above the pipe.
- L. When completed, each pipeline shall show a neat circular bore when lamped.
- M. Prior to placing perforated pipe and after the trench has been excavated, place an approved construction fabric in the trench, place a bed of Class 1 gravel on the fabric, install the perforated pipe on the gravel bed and backfill over pipe with Class 1 gravel and compact. Overlap fabric over pipe, backfill and compact remainder of trench with select material.

3.4 INSTALLATION - CATCH BASINS, DROP INLETS AND JUNCTION BOXES

- A. Form bottom of excavation clean and smooth to correct elevation.
- B. Form and place cast-in-place concrete base pad with provision for storm sewer pipe end sections.
- C. Establish elevations and pipe inverts for inlets and outlets as indicated.
- D. Mount lid and frame level in grout, secured to top cone section to elevation indicated.
- E. Inverts shall be smooth with uniform slopes from invert to invert.

- F. Brick structures shall have every fifth course of brick laid as headers. Other courses shall be stretchers.
- G. All mortar joints shall be full.
- H. Inside mortar joints shall be rubbed full and struck.
- I. The inside and outside of the brick work shall be covered with 0.5 inches of mortar.

3.5 INSTALLATION- TRENCH GRATES

- A. Install grates where indicated on plans flush and leveled with surrounding pavement surface.
- B. If needed, grind pads on underside of trench grates to level.
- C. Install steel angle frame, in concrete flush and leveled with surrounding paving surface, maintain flush and leveled at all times.
- D. Remove or protect trench grates if concrete or paver around trench well perimeter is chemically treated or acid washed.

3.6 FIELD QUALITY CONTROL

- A. Testing shall be in accordance with SCDOT Standard Specifications, latest edition.

3.7 PROTECTION

- A. Protect pipe from damage or displacement until backfilling operation is in progress.
- B. Protect drainage piping and catch basins from siltation during construction with the use of filter fabric.

END OF SECTION

SECTION 02525 - PRECAST DRAINAGE STRUCTURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Round and rectangular Precast Concrete Drainage Structures including Inlet Structure Components, Subgrade Structure Components, Grates, Covers, and accessories.

1.2 RELATED SECTIONS

- A. Section 02105 - General Excavation, Filling and Backfilling.
- B. Section 02500 - Storm Drainage System.

1.3 REFERENCES

- A. Prestressed Concrete Institute: Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products.
- B. National Precast Concrete Association: Quality Control Manual for Precast Concrete Plants.
- C. American Society for testing and Materials:
 - 1. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
 - 2. ASTM C890 - Standard Practice for Minimum Structural design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.
 - 3. ASTM C891 - Standard Practice for Installation of Underground Precast Concrete Utility Structures.
 - 4. ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures.
- D. American Association of State Highway and Transportation Officials Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible watertight Gaskets (AASHTO M198).
- E. American Concrete Institute: Building Code Requirements for Reinforced Concrete (ACI 318).
- F. Occupational Safety and Health Administration: Standard 1926.704 - Requirements for Precast Concrete.

1.4 SUBMITTALS SHALL BE AS FOLLOWS:

- A. Completed Certificate from this Specification Section sealed by a Registered Professional

Engineer on the staff of the Precast Concrete Manufacturer.

- B. Copy of Certificate or Report showing that the Precast Concrete Manufacturer conforms to Article 1.05 of this Specification Section.
- C. Schedule of the Drainage Structure Components to be provided on the project, charting the following:
 - 1. Sheet number where the structure plan and profile are shown.
 - 2. Line number when applicable.
 - 3. Drainage Structure or station number.
 - 4. Invert Elevation of the influent and effluent lines as shown on the plans.
 - 5. Inlet Structure Flowline Elevation as shown on the plans.
 - 6. Total height required from top of base slab to top of structure.
 - 7. Total height of the individual and assembled Drainage Structure Components.
 - 8. Top and bottom elevation of the Drainage Structure as calculated.
 - 9. Manufacturer's Part of Catalogue No. and number required of each component.
 - 10. Each Pipe size, type, and hole size and its distance from top of base slab.
 - 11. Pipe location in degrees clockwise from step centerline on round structures.
 - 12. Pipe location on rectangular structures by wall and intersecting angle relative to wall.
 - 13. Minimum round inside diameter or rectangular inside dimensions required.
- D. Detail of each precast concrete component to be provided, sealed by the Registered Professional Engineer employed by the manufacturer showing or charting the following:
 - 1. Manufacturer's Part No. or Catalogue No.
 - 2. Inside diameter or dimensions and lay length.
 - 3. Wall thickness and base or top thickness where applicable.
 - 4. Handling weight and lift hole or insert or loop description and location.
 - 5. Wire size, spacing and area provided per vertical foot (when applicable).
 - 6. Reinforcing bar size and spacing or location.
 - 7. Design loads for all rectangular components and round top slab components.
 - 8. Step locations on round structures.
 - 9. Concrete design strength and Manufacturer's mix number.
 - 10. Height, width, slope and annular space of the tongue & groove for products requiring tongue and groove joints.
- E. Step Detail and Material Specifications.
- F. Joint Material Detail, material Specifications and calculations showing that the joint material cross section is greater than the joints annular space times its height.
- G. Lifting Device and Hole Detail including design loads.
- H. Flow capacity of the assembled Inlet Structure Components using orifice flow, a discharge coefficient of 0.6, and the conditions shown in Article 2.02 of this Specification Section.
- I. At the request of the Engineer or Owner, submit the following:

1. Structural analysis and design calculations for precast rectangular components and round top slab components, performed in accordance with applicable codes and standards, showing that allowable stresses will not be exceeded. All calculations must be sealed by a Registered Professional Engineer employed by the Precast Concrete Manufacturer.
2. Calculations or test results verifying that the lifting device components and holes are designed in accordance with OSHA Standard 1926.704.
3. Concrete 28-day compression strength results for everyday production of Precast Components for the project was performed, showing the required strength according to the guidelines established in ACI 318.
4. Reinforcing and Cement mill reports for materials used in the manufacture of Precast Components for this project.
5. The above test reports for similar Precast Components recently produced, submitted prior to production of Precast Components for this project.

1.5 QUALIFICATIONS

- A. The Precast Manufacturer shall comply with one of the following requirements:
 1. Manufacture Precast Components for the project in a plant certified in the Prestressed Concrete Institute's (PCI) Plant Certification Program.
 2. Manufacture Precast Components for the project in a plant certified in the National Precast Concrete Association's (NPCA) Plant Certification Program.
 3. Retain an independent testing or consulting engineering firm approved by the Engineer for Precast plant inspection. The basis for plant inspection shall be the National Precast Concrete Association Quality Control Manual or the Manual for quality Control for Plants and Production of Precast and Prestressed Concrete Products. The above firm shall inspect the precast plant 2 weeks prior to and at 1 week intervals during production of materials for this project and issue a report, certified by a Registered Engineer that materials, methods, products, and quality control meet the requirements of the above quality control manuals.
- B. The Precast Manufacturer shall have a recognized Quality Improvement Process installed at the manufacturing facility.
- C. The Precast Manufacturer shall employ at least one Registered Professional Engineer at the manufacturing facility through the life of the project.
- D. Concrete compressive strength testing shall be performed in a laboratory inspected by the CCRL of the National Bureau of Standards. Testing shall be performed by Grade I ACI Certified Laboratory Technicians or by Level I PCI Certified Technicians.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Maintain materials and surrounding air temperature to minimum 50 degrees F prior to, during, and 48 hours after completion of masonry, grouting or concrete work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Concrete shall conform to ASTM C478 and as follows:
 - 1. Compressive strength: 5000 psi minimum at 28 days.
 - 2. Air Content: 4 percent minimum
 - 3. Cementitious Materials: Minimum of 564 pounds per c.y.
 - 4. Coarse Aggregates: ASTM C33. Sound, Crushed, Angular Granitic Stone only. Smooth or rounded stone shall not be used.
 - 5. Fine Aggregates: ASTM C33. Free from organic impurities.
 - 6. Chemical Admixtures: ASTM C494. Calcium Chloride or admixtures containing calcium chloride shall not be used.
 - 7. Air Entraining Admixtures: ASTM C260.
- B. Reinforcing steel shall be ASTM A615 grade 60 deformed bar, ASTM A82 wire or ASTM A185 welded wire fabric.
- C. Lift loops shall be ASTM A416 steel strand. Lifting loops made from deformed bars shall not be allowed.
- D. Flexible Joint Sealants shall be butyl rubber-based conforming to Federal Specification SS-S-210A, AASHTO M-198, Type B - Butyl Rubber and as follows: Maximum of 1% volatile matter and suitable for application temperatures between 10 and 100 degrees F.
- E. Epoxy Gels shall be a 2-component, solvent-free, moisture-insensitive, high modulus, high-strength, structural epoxy paste adhesive meeting ASTM C-881, Type I and II, Grade 3, Class B and C, Epoxy Resin Adhesive.

2.2 COMPONENTS

- A. Precast Components shall be designed and manufactured as described in this paragraph and in the following paragraphs for the specific components.
 - 1. Lifting Inserts, Hoes and Devices shall comply with OSHA Standard 1926.704. Lift holes and inserts shall be sized for a precision fit with the lift devices and shall not penetrate through the structure wall. Lifting Devices shall be provided by the Precast Manufacturer.
 - 2. Joints shall be sealed internally between the tongue and the groove and additionally around the external perimeter of the joint as follows:
 - a. External Seals shall consist of a polyethylene backed flat butyl rubber sheet no less than 1/16 inch thick and 6 inches wide applied to the outside perimeter of the joint.

- b. Internal Seals shall consist of a plastic or paper-backed butyl rubber rope no less than 14 feet long and having a cross-sectional area no less than the annular space times the height of the joint.
 - c. At the option of the Contractor, Internal Seals on round joints may consist of an O-Ring Gasket conforming to ASTM C443, installed according to the Precast Manufacturer's recommendation.
- 3. Rings, Covers, Grates, and Frames shall be Class 30 gray cast iron and shall be designed for 1600 lb wheel loads when located in roadways.
- 4. Precast Base Sections shall be cast monolithically without construction joints or with an approved galvanized or PVC waterstop cast in the cold joint between the base slab and the walls. The minimum size of the base section shall be as specified in the schedules.
- 5. Wall and inside slab finishes resulting from casting against forms standard for the industry shall be acceptable. Form ties through the wall are not allowed. Exterior slab surfaces below grade level shall have a float finish. Small surface holes, normal color variations, normal form joint marks, and minor depressions, chips and spills will be tolerated. Dimensional tolerances shall be as set forth in the appropriate References. Exposed Drainage Structure Top Components shall have a form finish or a light broom finish on their exposed surfaces. Fins, voids, chips, or fractures over 3/8 inch in diameter shall be filled with thin cement paste and finished to a color and texture reasonably consistent with that of formed finish. Rings and covers cast in exposed tops shall be free from cement paste build up.
- 6. Provisions for pipe entrances in the structures shall be cast or cored openings or knockout panels.
 - a. Pipe openings in round structures shall remain 6 inches clear of other pipe openings.
 - b. Pipe openings in rectangular structures shall not extend into the corners and may extend across a joint only when structural analysis shows stresses to be within the allowable.
 - c. Knockout Panel dimensions shall be as required by structural design at their maximum burial depth using the design loads specified herein.
- 7. Components shall be designed in accordance with ACI, ASTM C890 and the following loads:
 - a. Horizontal Load on Walls and Knockout Panels = an earth load of 80 psf per foot of burial depth plus a live lateral surcharge due to HS20 traffic loads of 80 psf.
 - b. Vertical Load on below grade adaptor slabs and tops = an earth load of 120 psf per foot of overburden plus a live HS20 traffic load.

- c. Vertical Load on Exposed Inlet Tops = a live 300 psf load.
 - d. Vertical Load on Cast Iron Covers and Grates supported around perimeter = a live HS20 traffic load.
- B. Round Subgrade Components shall be designed and manufactured in conformance with ASTM C478 and as follows:
- 1. Riser Sections shall have a minimum lay length of 16 inches.
 - 2. Precast Concentric and Eccentric Cone Section shall have an inside diameter at the top of 24 inches. The width of the top ledge shall be no less than the wall thickness required for the cone section.
 - 3. Precast Transition Cone or Top Sections may be used to provide an eccentric transition from 60 inch and larger structures to 48 inch diameter risers, cones, and adaptor slabs. Transition tops shall only be used in areas not subject to vehicle traffic and with no more than 20 feet of cover.
 - 4. Provide Steps in Bases, Risers, Cones, Transition Cones, Transition Cones, and Transition Top sections aligned vertically on 16 inch centers with the bottom step no more than 26 inches from the base slab. Secure steps to the wall with a compression fit in cast or drilled holes or cast in place. Steps shall not be vibrated or driven into freshly cast concrete or grouted in place. The steps shall be Copolymer Polypropylene Plastic reinforced with a 1/2 inch diameter grade 60 bar and have serrated tread and tall end lugs. Pullout strength shall be a minimum of 2000 lbs when tested according to ASTM C497.
 - 5. Joints of Bases, Risers and Cones shall be manufactured to the joint surface design and tolerance requirements of ASTM C361. The maximum slope of the vertical surface shall be 2 degrees. The maximum annular space at the base of the joint shall be 0.10". The minimum joint height shall be 4".
- C. Rectangular Subgrade Components shall be no less than 22 inches wide, 34 inches long, designed and manufactured in conformance with ASTM C913 and as follows:
- 1. Riser sections shall not be allowed on boxes smaller than 4 feet long by 4 feet wide. Risers may be used on base sections with knockout panels only when the burial depth limitations of the knockout panels will not be exceeded. Riser lay length shall be a minimum of 36 inches.
 - 2. Precast Transition Top Sections may be used to provide an eccentric transition from 4 foot by 4 foot and larger storm drain structures to 48 inch diameter risers, cones, and adaptor slabs. The maximum amount of fill over the transition top section shall be 20 feet.
 - 3. If shown on Storm Drain Details, provide fixed ladders in rectangular structures greater than 8 feet deep and less.
 - 4. Joints between precast components shall be keyways or tongue and groove.

Joints to accept Cast Iron Frames shall be flat and no less than 5" wide.

- D. [Grate Type] Inlet Components shall provide for a minimum inlet flow of 10 cubic feet per second with an unobstructed opening area and 6 inches of ponded water. Adaptor Slabs shall have a minimum opening size of 22 inches by 34 inches.
- E. [Curb Type] Inlet Components shall provide for a minimum inlet flow of 8 cubic feet per second with an unobstructed opening area and ponded water to the top of the curb. Precast Top Components shall have an integral cast iron Ring and Cover with a minimum opening diameter of 22 inches. Adaptor Slabs shall have a minimum clear opening of 34 inches by 34 inches.
- F. [Ditch Type] Inlet Components shall provide for a minimum inlet flow per open side of 6 cubic feet per second with an unobstructed opening area and 12 inches of ponded water. Adaptor Slabs shall have a minimum clear opening of 34 inches by 34 inches.
- G. [Access Manhole] Inlet Components shall have Cast Iron Rings and Covers shall be as shown in the details with an opening diameter of 22 inches. Adaptor Slabs and Cones shall have a minimum opening diameter of 24 inches. Precast Grade Rings conforming to ASTM C478, with a minimum lay length of 4 inches and totaling no more than 12 inches in height shall be used to adjust rings and covers to finished grade.

2.3 CONFIGURATION

- A. Construct [Grate Type] Drainage Structures to the elevations shown on the plans and as follows:
 - 1. A 24 inch by 36-inch Cast Iron Grate and Frame, and
 - 2. A 22 inch inside wide by 34 inch inside long by 24 inch to 72 inch inside tall Rectangular Subgrade Structure, or
 - 3. An Adaptor Slab and a Round or Rectangular Subgrade Structure sized according to the Schedule.
- B. Construct [Curb Type] Drainage Structures to the elevations shown on the plans with 46 inch wide by 7 inch tall Inlet Openings and as follows:
 - 1. A Rectangular Inlet Structure Top and a Rectangular Subgrade Structure with a minimum inside length of 46 inches and a minimum inside width of 34 inches sized according to the Schedule, or
 - 2. A rectangular Inlet Structure Top with transition to the Adaptor Slab, an Adaptor Slab, and a Round or Rectangular Subgrade sized according to the Schedule.
- C. Construct [Ditch Type] Drainage Structures to the elevations shown on the plans, with 34 inch wide by 7 inch tall minimum Inlet Openings, with Inlet Openings located as shown on the plans, and as follows:
 - 1. A Rectangular Inlet Structure Top with transition to the Subgrade Structure and a Rectangular Subgrade Structure with a minimum inside length of 46 inches and a minimum inside width of 34 inches sized according to the Schedule, or

2. A Rectangular Inlet Structure Top with transition to the Adaptor Slab, an Adaptor Slab, and a Round or Rectangular Subgrade Structure sized according to the Schedule.
- D. Construct [Access Manhole] Structures to the elevations shown on the plans and as follows:
1. A 24 inch diameter Cast Iron Ring and Cover, and
 2. A Concentric or Eccentric Cone or an Adaptor Slab and a Round or Rectangular Subgrade Structure sized according to the Schedule.
- E. Drainage Structures greater than 8 feet deep shall be no less than 48 inches in diameter or 48 inches wide by 48 inches long.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Inspect Drainage Structure Components prior to unloading from the delivery truck.

3.2 PREPARATION

- A. The Contractor shall coordinate delivery of the Drainage Structure Components to the jobsite with the Manufacturer. Handling of materials shall be done in accordance with ASTM C891 and the manufacturer's recommendations. Components should be handled and stored on the jobsite using methods that will prevent damage.

3.3 PLACING STORM DRAINAGE

- A. Excavate to the required depth and remove materials that are unstable or unsuitable for a good foundation. Prepare a level, compacted foundation extending 6" beyond the base.
- B. Set base plumb and level, aligning pipes in pipe openings 1 to 6 inches larger than the pipe OD.
- C. Thoroughly clean bells and spigots to remove dirt and other foreign materials that may prevent sealing. Unroll the Butyl Sealant rope directly against spigot or keyway. Leave protective wrapper attached until sealant is entirely unrolled. Do not stretch. Overlap from side to side - not top to bottom.
- D. Set risers, tops and cones for round structures so that steps align, taking particular care to clean, repair and seal joints.
- E. When recommended by the manufacturer, fill the void between horizontal joint surfaces with a sand cement grout around the outside perimeter.
- F. After joining sections, apply the butyl sealant sheet around the outside perimeter of the joint.
- G. Lift Holes leaving less than 2" of wall thickness shall be plugged from the outside using a sand cement mortar then covered with butyl rubber sheet. Lift Holes penetrating the wall

shall be additionally sealed with epoxy gel on the interior.

- H. Set the frames or tops to the required elevation sealing joints with butyl sealant rope and sheet.
- I. Clean foreign matter from the structure interior and perform touch up to exposed top surfaces as described in Paragraph 2.02 A.5 of this Specification Section.

3.4 SCHEDULES

A. ROUND STORM DRAIN STRUCTURES

- 1. Provide round subgrade structures with minimum inside diameters in inches based on the Pipe's outside diameter and the angle formed with the adjacent entering pipe as shown in the table below.

Largest Pipe OD	Minimum Degrees Between Pipe Entering Structure										
	180	165	150	135	120	105	90	75	60	45	30
15	48	48	48	48	48	48	48	48	48	72	96
21	48	48	48	48	48	48	48	60	60	84	120
27	48	48	48	48	48	48	60	60	72	96	NA
33	48	48	48	48	48	60	60	72	84	120	NA
39	48	48	48	60	60	60	72	84	96	NA	NA
45	60	60	60	60	72	72	84	96	108	NA	NA
51	72	72	72	72	72	84	84	108	120	NA	NA
57	72	72	72	72	84	84	96	108	NA	NA	NA
63	84	84	84	84	84	96	108	120	NA	NA	NA
69	84	84	84	84	96	108	120	NA	NA	NA	NA
75	96	96	96	96	96	108	120	NA	NA	NA	NA
81	96	96	96	96	108	120	NA	NA	NA	NA	NA
87	108	108	108	108	120	120	NA	NA	NA	NA	NA

- 2. Structures with smaller inside diameters may be supplied when pipe are of different diameters and calculations or shop drawings show that a minimum of 6 inches clearance will be maintained between pipe openings.
- 3. The minimum lay length of the base section shall be no less than the diameter of the pipe opening for pie OD up to 87 inches.

B. RECTANGULAR STORM DRAIN STRUCTURES

1. Provide rectangular subgrade structures with minimum inside wall widths based on the entering pipes outside diameter and the angle formed with the penetrated wall as shown in the chart below.

Largest Pipe OD	Minimum Degrees Between Pipe and Wall						
	90	80	70	60	50	40	30
15	22	22	22	22	22	34	34
21	22	22	22	34	34	34	46
27	34	34	34	34	46	46	58
33	34	34	46	46	46	58	70
39	46	46	46	46	58	70	82
45	46	46	58	58	70	70	94
51	58	58	58	70	70	82	106
57	58	58	70	70	82	94	118
63	70	70	70	82	82	106	130
69	70	70	82	82	94	118	142
75	82	82	82	94	106	118	154
81	82	82	94	94	106	130	166
87	94	94	94	106	118	142	178

2. Structures with narrower walls may be supplied when pipe are different diameters than shown and calculations or shop drawings show that the pipe will not penetrate the corners of the structure.

PRECAST DRAINAGE STRUCTURE

CERTIFICATION

Project: _____
Structures
Included: _____

Location: _____
Precast Manufacturer: _____
Owner: _____
Plant Location: _____

This is to certify the materials and manufacture of the Precast Components to be supplied for the Project described above will conform to the Project Specifications, specifically:

1. The Manufacturing Plant described above will maintain Certification through the Project construction life under the National Precast Concrete Association Plant Certification Program, Prestressed Concrete Institute Plant Certification Program, or through testing to be performed by _____ in accordance with Section 02525, Paragraph 1.05 A.3. of the Project Specifications.
2. A recognized Quality Improvement Process has been developed and is in place at the manufacturing facility described above. The Precast Manufacturer's Quality Policy is attached to this Certification.
3. _____ is a Registered Professional Engineer and will be employed by the Precast Manufacturer at the facility described above during the life of the construction of the Project.
4. All concrete compression strength testing for Precast Components will be performed in a laboratory inspected by the CCRL of the National Bureau of Standards. Testing will be performed by Technicians certified under ACI or PCI Certification Programs.
5. All components to be supplied will conform to Section 02525 Article 2.02 of the Project Specifications, including the Precast Components structural design requirements as established by reference in Section 02525, Article 1.03 of the Project Specifications.
6. Materials used in the manufacture of Components for the Project will conform to Section 02525, Article 2.01 of the Project Specifications. Raw Material Certificates of Compliance are attached to this Certification.

Respectfully Submitted by: _____

Date: _____
(Engineer described in Item 3 above, Seal, Signature, and Date below)

SECTION 02550 - UTILITY RELOCATION

PART I - GENERAL

1.1 SECTION INCLUDES

- A. 12" Ductile Iron waterline relocation.
- B. 10" Ductile Iron force main relocation.

1.02 RELATED SECTIONS

- A. Section 02050 - Demolition and Removal.
- B. Section 02105 - General Excavation, Filling and Backfilling

1.3 REFERENCES

- A. ANSI/ASTM A377 - Ductile Iron Pressure Pipe.
- B. ANSI/ASTM A48 - Gray Iron Castings.
- C. ANSI/AWWA C110/A21.10 - Ductile Iron Fittings for Dimensions w/ 80-60-03 metal per ASTM A339-55.
- D. ANSI/ASTM A21.11 - Rubber Gasket Joints for Cast Iron and Ductile Iron Pressure Fittings.
- E. ANSI/AWWA C104 - Cement Mortar Lined Ductile Iron Pipe.
- F. ANSI/AWWA C151 - Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand Molds for Water or Other Liquid.
- G. AWWA C600.4 - Testing of Sewer Force Mains.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Contractor shall furnish all materials required to complete utility relocation.
- B. Approved manufacturers: American Pipe, U.S. Pipe Clow Corp., Tindal Concrete, Sumter Machinery, Concrete Crispin Air Valves or others pre-approved by the Engineer.

2.2 PIPE

- A. All waterline and force main pipe shall be ductile iron cement lined with a minimum 225 psi pressure rating.
- B. Pipe shall be of the Georgetown County requirements.

- C. All pipe shall be of first quality with smooth interior surface, free from cracks, blisters, honeycombs and other imperfections. All pipe shall be true to theoretical shapes and forms.

2.3 PIPE ACCESSORIES

- A. All fittings shall be of the same material as the pipe molded and formed to suit pipe size and shape.

2.4 SEWER AIR RELEASE VALVES

- A. All air release valves shall be Crispin Model No. S20B pressure sewer valve as manufactured by Multiplex Manufacturing Company, Berwick, Pennsylvania or approved equal.
- B. Valves shall be long body design capable of venting not less than 15 standard cubic feet of free air per minute at 10 pounds working pressure.
- C. Valve inlet shall be 2 inches in diameter and shall be furnished with a 2-inch shut off valve.

2.5 MANHOLES

- A. Frame and Cover: as specified on the plans.
- B. Shaft and Top Construction: precast reinforced tongue and groove sections as shown on the plans.

PART 3 - EXECUTION

3.1 GENERAL

- A. Contractor is responsible for all staking. Owner will furnish a benchmark elevation at each site.
- C. The work shall include all ditching, diking, pumping, boiling, draining, flushing, testing and all provisions necessary to protect and maintain existing structures.
- D. All force main, gravity sewer lines, water lines and drainage shall be cleared of all foreign debris.

3.2 EXISTING UTILITIES

- A. Contractor is responsible for location and protection of existing utilities, structures, monuments, etc. Any damages to these shall be repaired at no cost to the owner.
- B. Contractor is responsible for contacting all utility companies and coordinating relocation of their facilities as needed to complete the project.

3.3 EXCAVATION, TRENCHING AND BACKFILLING

- A. Meet the respective requirements in Section 02105 - General Excavation, Filling and Backfilling.
- B. Waterline and force main shall be placed with a minimum of 3' of cover to the top of pipe.
- C. All safety requirements of OSHA must be met.
- D. Contractor shall dewater trench if necessary, at no additional cost to the owner.

3.4 INSPECTION

- A. Notify Georgetown County Public Works and Engineering prior to beginning and relocation during construction prior to testing and at final tie-ins.
- B. All work done and materials furnished shall be subject to the inspection of the Engineer and Inspector.
- C. All improper work and defective materials shall be reconstructed and replaced respectively at the contractor's expense.

3.5 TESTING AND LEAKAGE ALLOWANCE

- A. After each area of waterline and force main relocation is complete both ends shall be plugged and the pipe slowly filled with water. All air shall be expelled from the pipe through air release valves or temporary taps.
- B. The waterline and force main shall be subjected to a hydrostatic pressure of 150 pounds per square inch for a period of two hours.
- C. The leakage during the test shall not be more than that shown in the Allowable Leakage Table and/or AWWA C-600-4.
- D. Contractor shall be responsible for any temporary thrust blocking or restrained joints, required during testing. A temporary plug shall be installed at each pipe end.
- E. All pressure tests must be witnessed for the two-hour duration by the Engineer's inspector or Owner's inspector. Contractor shall notify Engineer a minimum of 24 hours prior to the pressure test.

LEAKAGE ALLOWANCE TABLE
(For 100 Joints)

Pipe Diameter	2"	3"	4"	6"	8"	10"	12"
Leakage Allowable in (GPH)	0.33	0.50	0.66	0.99	1.32	1.66	1.99

Any other leakage allowable can be obtained by the following formula:

$$L = \frac{N * D * (P)^{1/2}}{7400}$$

Where L = (Leakage in gallons per hour)
N = (Number of joints of a given size under test)
D = (Diameter of the pipe in inches)
P = (Test pressure in psi)

END OF SECTION

SECTION 2805 - SEEDING AND SODDING

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide all materials, equipment, and labor required to prepare soil, fertilizer, and other soil amendments specified, seed and mulch or sod all lawn areas indicated in plans, to establish seeded and/or sodded lawn as specified herein.

1.2 RELATED WORK

- A. Section 02105 - General Excavation, Filling, and Backfilling.

1.3 REFERENCES

- A. SCDOT Standard Specifications, latest edition.

1.4 DEFINITIONS

- A. Weeds: Includes Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel and Brome Grass.

1.5 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer.

1.6 QUALITY ASSURANCE

- A. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging and location of packaging.
- B. Sod: Minimum age of 18 months, with root development that will support its own weight, without tearing, when suspended vertically.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver grass seed mixture in original sealed containers. Seed in damaged packaging is not acceptable.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis and name of manufacturer.
- C. Store seed and fertilizer in manner to prevent wetting and deterioration.
- D. Deliver sod on pallets. Do not deliver more sod than can be laid in 24 hours.

1.8 PROJECT CONDITIONS

- A. Protect existing utilities, paving, and other facilities from damage caused by seeding and sodding operations.
- B. Restrict traffic from lawn areas until grass is established. Erect signs and barriers as necessary.

1.9 PLANTING DATES

- A. Sow seed during the following seasons:
 - 1. Season 1 - March 16 to August 31
 - 2. Season 2 - September 1 to March 15

1.10 WARRANTY

- A. Provide a uniform stand of grass by mowing and maintaining seeded and sodded areas until final acceptance. Areas which fail to provide a uniform stand of grass shall be re-seeded or re-sodded with specified materials until all affected areas are accepted by Owner.

PART 2 - PRODUCTS

2.1 SEED MIXTURE

- A. Season 1
 - 60% Common Bermuda (hulled)
 - 40% Browntop Millet
- B. Season 2
 - 50% Common Bermuda (unhulled)
 - 50% Annual Ryegrass

Note: Growth of Ryegrass in early Spring must be suppressed to prevent rye from choking out permanent grass.

2.2 SOD

- A. Nursery grown, pasture sod. Provide well rooted healthy sod, free of diseases, nematodes, and soil borne insects. Provide sod uniform in color, leaf texture, free from weeds, undesirable grasses, stones, roots, thatch, and other extraneous matter; viable and capable of growth and development when planted. Furnish sod machine stripped and of supplier's standard width, length, and thickness; uniformly 1-1/2" thick with clean cut edges. Mow sod before stripping.
- B. Grass Type: Centipede and Bermuda.

2.3 SOIL MATERIALS

- A. Topsoil: Excavated from site and free of weeds.

2.4 ACCESSORIES

- A. Fertilizer: FS O-F-241, Recommended for grass, with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, to the following proportions: Nitrogen 10 percent, phosphoric acid 10 percent, soluble potash 10 percent or as directed by the Owner/Engineer. Application rate shall be 1,000 pounds per acre (25 lbs per 1,000 square feet).
- B. Water: Clean, fresh and free of substances or matter which could inhibit vigorous growth of grass.
- C. Lime: Lime shall be applied at the rate of 3,000 pounds per acre (69 lbs. per 1,000 square foot) and shall be ground limestone containing not less than 85% of total carbonate. Lime shall be ground such that at least 50% will pass through a #20 sieve.
- D. Straw Mulch: Clean oat or wheat straw well-seasoned before bailing, free from mature seed-bearing stalks or roots.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that prepared soil base is ready to receive the work of this Section.
- B. Beginning of installation means acceptance of existing site conditions.

3.2 PREPARATION

- A. Ensure that fine grading is completed.
- B. Scarify topsoil of lawn area to be seeded to a minimum depth of 4". Remove all stones, sticks, roots, rubbish, and extraneous vegetable and foreign non-organic materials.
- C. Grade to eliminate rough, low, or soft areas, to ensure positive drainage and to create a smooth, even surface free of stones or soil clods over 1-1/2" in diameter.

3.3 FERTILIZING AND LIMING

- A. Apply lime at a rate of 3,000 lbs/acre.
- B. Apply fertilizer at a rate of 1,000 lbs/acre.
- C. Apply after smooth raking of topsoil.
- D. Apply fertilizers by mechanical rotary or drop type distributor, thoroughly and evenly incorporated with soil, to a depth of two to four inches.

- E. Restore prepared area to a fine grade prior to applying seed.

3.4 SEEDING

- A. Seed immediately after preparation of bed.
- B. Seed indicated areas within contract limits and areas adjoining contract limits disturbed as a result of construction operations.
- C. Seed when soil is dry and when winds do not exceed five miles per hour velocity.
- D. Acceptable application methods:
 - 1. Apply seed with rotary or drop type distributor. Install evenly by sowing equal quantities in two (2) directions, at right angles to each other.
 - 2. Apply with hydroseeding machine.
- E. Sow grass seed at a rate of 5 lbs/1000 square feet.
- F. After seeding, lightly rake and roll seed into top 1/4 inch of topsoil, if applied by rotary or drop spreader.

3.5 MULCHING

- A. Place straw mulch on seeded areas within twenty-four hours after seeding.
- B. Place straw mulch uniformly in a continuous blanket at the rate of one and one-half tons per acre, where hydroseeding method is not used.
- C. Tack: All seeded slopes exceeding 3:1 to have asphalt tack applied at the rate of 225 gallons/acre.

3.6 SEED PROTECTION

- A. Cover seeded slopes in drainage swales with erosion fabric where required to prevent wash out of seed. Roll fabric onto slopes without stretching or pulling.
- B. Lay fabric smoothly on surface. Provide 12-inch overlap of adjacent rolls.
- C. Secure outside edges and overlaps at 36-inch intervals with stakes.
- D. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.

3.7 LAYING SOD

- A. Moisten prepared surface immediately prior to laying sod.
- B. Lay sod with 24 hours after harvesting to prevent deterioration.

- C. Lay sod tight with no open joints visible, and no overlapping; stagger end joints twelve (12) inches minimum. Do not stretch or overlap sod pieces. Install in straight rows, except when lining adjacent plant beds.
- D. Lay smooth. Place top elevation of sod flush with adjoining paving or curbing.
- E. Securely anchor in place with sod anchors when slopes are greater than 3:1 or in areas of swales or drainage ditches which are prone to runoff.
- F. Water sodded areas immediately after installation. Saturate sod to four (4) inches.
- G. After sod and soil have dried, roll sodded areas to ensure good bond between sod and soil and to remove minor depressions and irregularities.

3.8 MAINTENANCE

- A. Maintain seeded and sodded lawns until completion and acceptance of the lawn areas by the Owner.
- B. Maintain seeded areas including watering, spot weeding, application of herbicides, fungicides, insecticides, and re-seeding until a full, uniform stand of grass, free from weeds, undesirable grass species, diseases and insects is achieved and accepted by the Owner.
 - 1. Repair, re-work, and re-seed all areas that have washed out, are eroded, or do not germinate.
 - 2. Mow seeded areas as soon as top growth reaches three inches in height. Cut back to two inches in height.
 - 3. After first mowing of grass, and substantial coverage is achieved (at least 85%), responsibility for mowing shall become the Owner's. However, mowing by Owner does not indicate acceptance and seeded areas shall not be accepted until coverage requirements are met.
 - 4. Temporary seeding for erosion control during early stages of construction shall be maintained entirely by contractor.
- C. Maintain sodded areas including watering, spot weeding, mowing, application of herbicides, fungicides, insecticides, and re-sodding until a full uniform stand of grass, free of weeds, undesirable grass species, diseases and insects is achieved and accepted by Owner.
 - 1. Water sod thoroughly every two to three days to establish proper rooting.
 - 2. Repair, re-work, and re-sod all areas that have washed out or are eroded or show deterioration or bare spots.
 - 3. Mow sodded areas as soon as top growth reaches three inches. Cut back to two inches and maintain.

4. Mow grass at regular intervals to maintain at a maximum height of 2-1/2". Do not cut more than 1/3 of grass at one mowing.

3.9 CLEANING

- A. Perform cleaning during installation of work and upon completion of the work. Remove from site all excess materials, debris, and equipment.

3.10 ACCEPTANCE

- A. Seeded areas shall be inspected by Owner and shall not be accepted until seeded areas are free of bare spots over one square foot or unacceptable coverage totaling more than 2% of individual area.
- B. Sodded areas shall be inspected by Owner and shall not be accepted until sod is full, uniform, and rooted in place.
- C. Upon acceptance, the Owner will assume all maintenance.

END OF SECTION

SECTION 029000 - MODULAR CONCRETE RETAINING WALL

PART 1 - GENERAL

1.1 Description

- A. Work shall consist of furnishing and construction of a KEYSTONE Retaining Wall System or equal in accordance with these specifications and in reasonably close conformity with the lines, grades, design, and dimensions shown on the plans.
- B. Work includes preparing foundation soil, furnishing and installing leveling pad, unit drainage fill and backfill to the lines and grades shown on the construction drawings.
- C. Work includes furnishing and installing geogrid soil reinforcement of the type, size, location, and lengths designated on the construction drawings.

1.2 Related Sections

- A. Section 02105 - Excavation, Filling, and Backfilling.

1.3 Reference Documents

- A. ASTM C-1372 Specification for Segmental Retaining Wall Units
- B. ASTM D-422 Particle Size Analysis
- C. ASTM D-698 Laboratory Compaction Characteristics of Soil – Standard Effort
- D. ASTM D-4318 Liquid Limit, Plastic Limit and Plasticity Index of Soils
- E. ASTM D-4595 Tensile Properties of Geotextiles – Wide Width Strip
- F. ASTM D-5262 Unconfined Tension Creep Behavior of Geosynthetics
- G. ASTM D-3034 Polyvinyl Chloride Pipe (PVC)
- H. ASTM D-1248 Corrugated Plastic Pipe
- I. GRI-GG4 Determination of Long-Term Design Strength of Geogrids
- J. GRI-GG5 Determination of Geogrid (soil) Pullout
- K. NCMA SRWU-1 Test Method for Determining Connection Strength of SRW
- L. NCMA SRWU-2 Test Method for Determining Shear Strength of SRW

1.4 Submittals/Certification

- A. Contractor shall submit a Manufacturer's certification, prior to start of work, that the retaining wall system components meet the requirements of this specification and the structure design.

- B. Contractor shall submit construction drawings and design calculations for the retaining wall system prepared and stamped by a Professional Engineer registered in the state of the project. The engineering designs, techniques, and material evaluations shall be in accordance with the Manufacturer's Design Manual, NCMA Design Guidelines for Segmental Retaining Walls, or the AASHTO Standard Specifications for Highway Bridges, Section 5.8 (whichever is applicable to designer).
- C. Contractor shall submit a test report documenting strength of specific modular concrete unit and geogrid reinforcement connection. The maximum design tensile load of the geogrid shall be equal to the laboratory tested ultimate strength of geogrid/facing unit connection at a maximum normal force limited by the "Hinge Height" of the structure divided by a safety factor of 1.5. The connection strength evaluation shall be performed in accordance with NCMA test method SRWU-1.

1.5 Quality Assurance

- A. Contractor shall submit certification, prior to start of work, that the retaining wall system (modular concrete units and specific geogrid):
 - 1) has been successfully utilized on a minimum of five (5) similar projects, i.e. height, soil fill types, erection tolerances, etc.; and
 - 2) has been successfully installed on a minimum of 1 million (1,000,000) square feet of retaining walls.
- B. Contractor shall submit a list of five (5) previously constructed projects of similar size and magnitude by the wall installer where the specific retaining wall system has been constructed successfully. Contact names and telephone numbers shall be listed for each project.
- C. Contractor shall provide evidence that the design engineer has a minimum of five (5) years of documentable experience in the design for reinforced soil structures. The design engineer shall provide proof of current professional liability insurance with an aggregate coverage limit of not less than \$2,000,000.00.
- D. Owner shall/may provide soil testing and quality assurance inspection during earthwork and wall construction operations. Contractor shall provide any quality control testing or inspection not provided by the Owner. Owner's quality assurance program does not relieve the contractor of responsibility for quality control and wall performance.

1.6 Delivery, Storage and Handling

- A. Contractor shall check all materials upon delivery to assure that the proper type, grade, color, and certification have been received.
- B. Contractor shall protect all materials from damage due to jobsite conditions and in accordance with manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

PART 2 - PRODUCTS

2.1 Definitions

- A. Modular Unit – a concrete retaining wall element machine made from portland cement, water, and aggregates.
- B. Structural Geogrid – a structural element formed by a regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, or earth and function primarily as reinforcement.
- C. Unit Drainage Fill – drainage aggregate, which is placed within and immediately behind the modular concrete units.
- D. Reinforced Backfill – compacted soil that is placed within the reinforced soil volume as outlined on the plans.

2.2 Modular Concrete Retaining Wall Units

- A. Modular concrete units shall conform to the following architectural requirements.
 - 1. Face color – concrete gray.
 - 2. Face finish – sculptured rock face in angular tri-planer configuration. Other face finishes will not be allowed without written approval of Owner.
 - 3. Bond configuration – running with bonds nominally located at midpoint vertically adjacent units, in both straight and curved alignments.
 - 4. Exposed surfaces of units shall be free of chips, cracks or other imperfections when viewed from a distance of ten (10) feet under diffused lighting.
- B. Modular concrete materials shall conform to the requirements of ASTM C1372 – Standard Specifications for Segmental Retaining Wall Units.
- C. Modular concrete units shall conform to the following structural and geometric requirements measured in accordance with appropriate references.
 - 1. Compressive strength = 3000 psi minimum.
 - 2. Absorption = 8% maximum for standard weight aggregates.
 - 3. Dimensional tolerances = $\forall 1/8$ " from nominal unit dimensions not including rough split face, $\forall 1/16$ " unit height – top and bottom planes.
 - 4. Unit size – 8" (H) x 18" (W) x 18" (D) minimum.
 - 5. Unit weight – 100 lbs/unit minimum for standard weight aggregates.
 - 6. Inter-unit shear strength – 1500 plf minimum at 2 psi normal pressure;

7. Geogrid/unit peak connection strength – 1000 plf minimum at 2 psi normal.

D. Modular concrete units shall conform to the following constructability requirements:

1. Vertical setback = 1/8"∇ per course (near vertical) or 1"+ per course per the design; alignment and grid positioning mechanism – fiberglass pins, two (2) per unit minimum; maximum horizontal gap between erected units shall be – ½ inch.

2.3 Shear Connectors

- A. Shear connectors shall be ½ inch diameter thermoset isophthalic polyester resin-pultruded fiberglass reinforcement rods or equivalent to provide connection between vertically and horizontally adjacent units. Strength of shear connectors between vertical adjacent units shall be applicable over a design temperature of 10 degrees F to +100 degrees F.
- B. Shear connectors shall be capable of holding the geogrid in the proper design position during grid pre-tensioning and backfilling.

2.4 Base Leveling Pad Material

- A. Material shall consist of a compacted crushed stone base or non-reinforced concrete as shown on the construction drawings.

2.5 Unit Drainage Fill

- A. Unit drainage fill shall consist of clean 1" minus crushed stone or crushed gravel meeting the following gradation tested in accordance with ASTM D-422:

<u>Sieve Size</u>	<u>Percent Passing</u>
1 inch	100
¾ inch	75-100
No. 4	0 – 10
No. 50	0 – 5

- B. One (1) cubic foot, minimum, of drainage fill shall be used for each square foot of wall face. Drainage fill shall be placed within cores of, between, and behind units to meet this requirement.

2.6 Reinforced Backfill

- A. Reinforced backfill shall be free of debris and meet the following gradation tested in accordance with ASTM D-422:

<u>Sieve Size</u>	<u>Percent Passing</u>
2 inch	100-75
¾ inch	100-75
No. 40	0-60
No. 200	0-35

Plasticity Index (PI) <15 and Liquid Limit <40 per ASTM D-4318.

- B. The maximum aggregate size shall be limited to ¾ inch unless field tests have been performed to evaluate potential strength reductions to the geogrid design due to damage during construction.
- C. Material can be site-excavated soils where the above-requirements can be met. Unsuitable soils for backfill (high plastic clays or organic soils) shall not be used in the backfill or in the reinforced soil mass.
- D. Contractor shall submit reinforced fill sample and laboratory test results to the Architect/Engineer for approval prior to the use of any proposed reinforced fill material.

2.7 Geogrid Soil Reinforcement

- A. Geosynthetic reinforcement shall consist of geogrids manufactured specifically for soil reinforcement applications and shall be manufactured from high tenacity polyester yarn or high-density polyethylene. Polyester geogrid shall be knitted from high tenacity polyester filament yarn with a molecular weight exceeding 25,000 Meg/m and a carboxyl end group values less than 30. Polyester geogrid shall be coated with an impregnated PVC coating that resists peeling, cracking, and stripping.
- B. Ta, Long Term Allowable Tensile Design Load, of the geogrid material shall be determined as follows:

$$T_a = T_{ult} / (R_{Fcr} * R_{Fd} * R_{Fid} * FS)$$

Ta shall be evaluated based on a 75-year design life.

1. Tult, Short Term Ultimate Tensile Strength
Tult is based on the minimum average roll values (MARV)
 2. RFcr, Reduction Factor for Long Term Tension Creep
RFcr shall be determined from 10,000-hour creep testing performed in accordance with ASTM D5262. Reduction value = 1.60 minimum.
 3. RFd, Reduction Factor for Durability
RFd shall be determined from polymer specific durability testing covering the range of expected soil environments. RFd = 1.10 minimum.
 4. RFid, Reduction Factor for Installation Damage
RFid shall be determined from product specific construction damage testing performed in accordance with GRI-GG4. Test results shall be provided for each product to be used with project specific or more severe soil type. RFid = 1.10 minimum.
 5. FS, Overall Design Factor of Safety
FS shall be 1.5 unless otherwise noted for the maximum allowable working stress calculation.
- C. The maximum design tensile load of the geogrid shall not exceed the laboratory tested ultimate strength of the geogrid/facing unit connection as limited by the

“Hinge Height” divided by a factor of safety of 1.5. The connection strength testing and computation procedures shall be in accordance with NCMA SRWU-1 Test Method for Determining Connection Strength of SRW.

- D. Soil Interaction Coefficient, C_i
 C_i values shall be determined per GRI:GG5 at a maximum 0.75-inch displacement.
- E. Manufacturing Quality Control
 The geogrid manufacturer shall have a manufacturing quality control program that includes QC testing by an independent laboratory.
 The QC testing shall include:
 - Tensile Strength Testing
 - Melt Flow Index (HDPE)
 - Molecular Weight (Polyester)

PART 3 - EXECUTION

3.1 Excavation

- A. Contractor shall excavate to the lines and grades shown on the construction drawings. Owner’s representative shall inspect the excavation and approve prior to placement of leveling material or fill soils. Proof roll foundation area as directed to determine if remedial work is required.
- B. Over-excavation and replacement of unsuitable foundation soils and replacement with approved compacted fill will be compensated as agreed upon with the Owner.

3.2 Base Leveling Pad

- A. Leveling pad material shall be placed to the lines and grades shown on the construction drawings to a minimum thickness of 6 inches and extend laterally a minimum of 6: in front and behind the modular wall unit.
- B. Soil leveling pad material shall be compacted to a minimum of 95% Standard Proctor density per ASTM D-698.
- C. Leveling pad shall be prepared to insure full contact to the base surface of the concrete units.

3.3 Modular Unit Installation

- A. First course of units shall be placed on the leveling pad at the appropriate line and grade. Alignment and level shall be checked in all directions and insure that all units are in full contact with the base and properly seated.
- B. Place the front of units side-by-side. Do not leave gaps between adjacent units. Layout of corners and curves shall be in accordance with manufacturer’s recommendations.
- C. Install shear/connecting devices per manufacturer’s recommendations.

- D. Place and compact drainage fill within and behind wall units. Place and compact backfill soil behind drainage fill. Follow wall erection and drainage fill closely with structure backfill.
- E. Maximum stacked vertical height of wall units, prior to unit drainage fill and backfill placement and compaction, shall not exceed two (2) courses.

3.4 Structural Geogrid Installation

- A. Geogrid shall be oriented with the highest strength axis perpendicular to the wall alignment.
- B. Geogrid reinforcement shall be placed at the strengths, lengths, and elevations shown on the construction design drawings or as directed by the Engineer.
- C. The geogrid shall be laid horizontally on compacted backfill and attached to the modular wall units. Place the next course of modular concrete units over the geogrid. The geogrid shall be pulled taut and anchored prior to backfill placement on the geogrid.
- D. Geogrid reinforcements shall be continuous throughout their embedment lengths and placed side-by-side to provide 100% coverage at each level. Spliced connections between shorter pieces of geogrid or gaps between adjacent pieces of geogrid are not permitted.

3.5 Reinforced Backfill Placement

- A. Reinforced backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid and installation damage.
- B. Reinforced backfill shall be placed and compacted in lifts not to exceed 6 inches where hand compaction is used, or 8-10 inches where heavy compaction equipment is used. Lift thickness shall be decreased to achieve the required density as required.
- C. Reinforced backfill shall be compacted to 95% of the maximum density as determined by ASTM D698. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer and shall be dry of optimum, +0%, -3%.
- D. Only lightweight hand-operated equipment shall be allowed within three (3) feet from the tail of the modular concrete unit.
- E. Tracked construction equipment shall not be operated directly upon the geogrid reinforcement. A minimum fill thickness of six (6) inches is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.
- F. Rubber tired equipment may pass over geogrid reinforcement at slow speeds, less than 10 MPH. Sudden braking and sharp turning shall be avoided.

G. At the end of each day's operation, the Contractor shall slope the last lift of reinforced backfill away from the wall units to direct runoff away from wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

3.6 Cap Installation

A. Cap units shall be glued to underlying units with an all-weather adhesive recommended by the manufacturer.

3.7 As-Built Construction Tolerances

A. Vertical alignment: $\nabla 1.5''$ over any 10' distance.

B. Wall Batter: within two (2) degrees of design batter.

C. Horizontal alignment: $\nabla 1.5''$ over any 10' distance.

D. Maximum horizontal gap between erected units shall be $\frac{1}{2}$ inch.

3.8 Field Quality Control

A. Quality Assurance - The Owner shall/may engage inspection and testing services, including independent laboratories, to provide quality assurance and testing services during construction. This does not relieve the Contractor from securing the necessary construction control testing.

B. Quality assurance should include foundation soil inspection - Verification of geotechnical design parameters, and verification that the contractor's quality control testing is adequate as a minimum. Quality assurance shall also include observation of construction for general compliance with design drawings and project specifications. Quality assurance is best performed by the site geotechnical engineer.

C. Quality Control - The Contractor shall engage inspection and testing services to perform the minimum quality control testing described in the retaining wall design plans and specifications. Only qualified and experienced technicians and engineers shall perform testing and inspection services.

D. Quality control testing shall include soil and backfill testing to verify soil types and compaction and verification that the retaining wall is being constructed in accordance with the design plans and project specifications.

END OF SECTION

SECTION 03250 - CONCRETE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Cast-in-place concrete for storm drainage system, paving, curb and gutter, slabs and walks.
- B. Reinforcing Steel.
- C. Concrete Curing.
- D. Concrete Repair.

1.2 RELATED SECTIONS

- A. Section 02500 - Storm Drainage System.

1.3 REFERENCES

- A. ACI 301 - Specifications for Structural Concrete for Buildings.
- B. ASTM C 33 - Concrete Aggregates.
- C. ASTM C 94 - Ready-Mixed Concrete.
- D. ASTM C 150 - Portland Cement.
- E. ASTM C 260 - Air-Entraining Admixtures for Concrete.
- F. ASTM C 494 - Chemical Admixtures for Concrete.
- G. ACI 315 - Details and Detailing of Concrete Reinforcement.
- H. ASTM A 82 - Cold Drawn Steel Wire for Concrete Reinforcement.
- I. ASTM A 185 - Welded Steel Wire Fabric for Concrete Reinforcement.
- J. ANSI/AWS D1.4 - Structural Welding Code Reinforcing Steel.
- K. ASTM A 615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
- L. CRSI - Manual of Practice.
- M. ASTM C 309 - Liquid Membrane - Forming Compounds for Curing Concrete.
- N. ASTM D 2103 - Polyethylene Film and Sheeting.
- O. FS TT-C-800 - Curing Compound, Concrete for New and Existing Surfaces.

1.4 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301.
- B. Obtain materials from same source throughout.

1.5 TESTS

- A. Testing and analysis of concrete will be performed under provisions as defined in the SCDOT Standard Specifications.
- B. Submit proposed mix design of each class of concrete to Engineer for Review prior to commencement of work.
- C. Test of cement and aggregates will be performed to ensure conformance with requirements stated herein.

1.6 PRODUCT DATA

- A. Submit mill test certificates of supplied concrete reinforcing indicating physical and chemical analysis.
- B. Provide product data for specified products.
- C. Submit all manufacturer's installation instructions.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete in temperatures less than 40 degrees F without Engineer's approval.
- B. Maintain ambient temperature at 70 degrees F (minimum) for three days for curing.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cement: ASTM C150, normal - Type 1, air entraining - Type 1A moderate, high early strength Type III, air entraining - Type III Portland Type; gray color.
- B. Fine and Coarse Aggregates: ASTM C 33.
- C. Water: Clean and not detrimental to concrete.

2.2 ADMIXTURES

- A. Air Entrainment: ASTM C 260.
- B. Chemical Admixture: ASTM C 494 Type A - water reducing. Type B - retarding. Type C - accelerating. Type D - water reducing and retarding. Type E - water reducing and accelerating.

2.3 CONCRETE MIX

- A. Mix concrete in accordance with ASTM C 94.
- B. Provide concrete for all wingwall, footing and slab construction of the following characteristics:
 - 1. Comprehensive Strength
(7 days): 3200 psi
 - 2. Comprehensive Strength
(28 days): 4000 psi
- C. Provide concrete for All Other Concrete Construction of the following characteristics:

<u>Unit</u>	<u>Measurement</u>
Comprehensive Strength (7 days):	2400 psi
Comprehensive Strength (28 days):	3000 psi
- D. Use accelerating admixtures in cold weather only when approved by Engineer. Use of admixtures will not relax cold weather placement requirements.
- E. Use set-retarding admixtures during hot weather only when approved by Engineer.
- F. Add air entraining agent to all concrete mixes for concrete work.

2.4 REINFORCING STEEL MATERIALS

- A. Reinforcing Bars: ASTM A 615, 60 KSI yield grade, billet-steel deformed bars with uncoated finish as specified on the plans.
- B. Welded Steel Wire Fabric: ASTM A 185, plain type, coiled rolls, uncoated finish 6" x 6" mesh of 0.135" diameter.
- C. Stirrup Steel - ASTM A 82.
- D. Tie Wire: Minimum 16 gage annealed type - acceptable patented system.
- E. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete.

2.5 CURING MATERIALS

- A. Water: Clean and not detrimental to concrete.

- B. Membrane Curing Compound: ASTM C 309, FSTT-C-800.
- C. Chem-trete curing compound by Trocal or equivalent.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, held securely, and will not cause hardship in placing concrete.

3.2 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Apply bonding agent in accordance with manufacturer's instructions.
- B. At locations where new concrete is dowelled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- C. Before placing concrete, clean reinforcement of foreign particles or coating and remove any foreign material in forms by sweeping, blowing or washing.

3.3 PLACING CONCRETE

- A. Notify Engineer minimum 24 hours prior to commencement of concreting operations.
- B. Place concrete in accordance with ACI 301.
- C. Hot Weather Placement: ACI 301.
- D. Cold Weather Placement: ACI 301.
- E. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.
- F. Maintain concrete cover around reinforcing as follows:

<u>ITEM</u>	<u>COVERAGE</u>
Supported Slabs and Joists	2 inch
Walls (Exposed to Weather or Backfill)	2 inch
Footings & Concrete Formed Against Earth	2 inch
Slabs on Fill	2 inch

- G. Place concrete continuously between predetermined construction and control joints. Do not break or interrupt successive pours such that cold joints occur.
- H. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.

3.4 FINISHING

- A. Provide concrete surfaces to be left exposed, concrete walls with sack rubbed finish or as directed by the Engineer.

3.5 PATCHING

- A. Notify Engineer immediately upon removal of forms.
- B. Patch imperfections.

3.6 DEFECTIVE CONCRETE

- A. Modify or replace concrete not conforming to required levels and lines, details and elevations.
- B. Repair or replace concrete not properly placed or of the specified type.

3.7 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of the SCDOT Standard Specifications
- B. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature and test samples taken.

3.8 PROTECTION

- A. Protect all finished work.
- B. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures and mechanical injury.
- C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

END OF SECTION