CONTRACT DOCUMENTS AND SPECIFICATIONS
FOR

CROSSWELL NEIGHBORHOOD
STORMWATER IMPROVEMENTS
PHASE 1

FOR THE

CITY OF SUMTER, SC

CITY OF SUMTER BID NUMBER ITB#38-24/25

AECOM TECHNICAL SERVICES, INC.
PROJECT NO.: 60591852

December 2024

BID DOCUMENTS

THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION.

CONTRACTOR: _____

ADDRESS: _____

CONTRACTOR'S LICENSE NUMBER: _____

AECOM

AECOM Technical Services, Inc.
2151 Pickens Street, Suite 301, Columbia, SC 29201
(803) 254-4400 FAX: (803) 845-4837

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

FOR THE

CITY OF SUMTER, SC

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December 2024

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DIVISION 4 Through DIVISION 16 – NOT USED

END OF SECTION

00020

ADVERTISEMENT FOR BIDS

AECOM Technical Services, Inc. Project No.: 60591852

Separate sealed bids for the Crosswell Neighborhood Stormwater Improvements – Phase I will be received by the City of Sumter, Stormwater Department, at 303 East Liberty Street, Sumter, SC 29150 no later than 2:00 P.M. on Thursday, January 23rd, 2025. Bids may be mailed, overnighted, or hand delivered. Bid openings will be held/ read aloud in the conference room beginning at 2:00 P.M.

The work to be done consists of furnishing all materials, equipment, and labor necessary to construct the Crosswell Neighborhood stormwater system improvements – Phase I consisting approximately 4,000 LF of new RCP storm drainage and 32 drainage boxes, and miscellaneous demolition, utility relocation, and fine grading to facilitate the project.

The Information for Bidders, Bid Form, Contract, Plans, Specifications, Bid Bond, Performance Bond and Payment Bond, and other contract documents may be examined at the following locations:

Owner: City of Sumter, Sumter, SC.
Engineers: AECOM Technical Services, Inc., Columbia, SC.

Bidder must be an official plan holder for bid to be considered. To obtain electronic copies (.pdf) of drawings, specifications and contract documents and be placed on the official plan holders list, contact Jason Outlaw at 1(803)740-1802 or jason.outlaw@aecom.com at AECOM Technical Services, Inc., 2151 Pickens Street, Suite 301, Columbia, SC 29201. Hard paper copies of the plans and specifications are available for a non-refundable payment of $150.00. When requesting drawings, specifications, or contract documents, provide the following information about your company: POC and their Mailing address; street (UPS) address; telephone number; and FAX number (if applicable), and e-mail address and SC Contractors License Number.

Bidders must deposit security with all bids. Security shall be in the form of a certified check or bid bond made payable to the Owner,and shall be for an amount equal to not less than five percent (5%) of the amount of the bid. Provisions of the security shall be as described in the Information for Bidders.

No bid will be considered unless the bidder is legally qualified under the provisions of the South Carolina Contractor's Licensing Law (South Carolina Code of Laws as amended on April 1, 1999, Chapter 11, Sections 40-11-10 through 40-11-428).

Contractors shall have a classification of WL.

No bidder may withdraw the bid within 90 days after the actual date of the opening and thereof.

The Owner reserves the right to waive any informalities or to reject any or all bids.

ENGINEERS

AECOM Technical Services, Inc.
2151 Pickens Street, Suite 301
Columbia, SC 29201

OWNER

City of Sumter, PWD
303 E Liberty Street
Sumter, SC 29153

00100.1

INFORMATION FOR BIDDERS

1. RECEIPT AND OPENING OF BIDS

The City of Sumter (hereinafter called the "Owner"), invites bids on the Bid Form - Unit Price attached hereto, all blanks of which must be appropriately filled in. Bids will be received by the Owner at the City of Sumter Stormwater Department at 303 East Liberty Street, Sumter, S.C. 29150 no later than 2:00 P.M. on Thursday, January 23rd, 2025. Bids may be mailed, overnighted, or hand delivered. The envelopes containing your bid and Bid Bond only must be sealed, addressed to City of Sumter and designated as Bid for Crosswell Neighborhood Stormwater Improvements – Phase 1.

The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 90 days after the actual date of the opening thereof.

2. PREPARATION OF BID

Each bid must be submitted on the Bid Form - Unit Price. All blank spaces for bid prices must be filled in, in ink or typewritten and a Bid Bond must be submitted with the bid.

Bids which are incomplete, unbalanced, conditional or obscure, or which contain additions not called for, erasures, alterations, or irregularities of any kind, or which do not comply with the Information for Bidders, may be rejected at the option of the Owner.

The correct total amount bid for the completed work is defined as the correct sum total of the amounts bid for the individual items in the Proposal. The correct amount bid for each unit price item is defined as the correct product of the quantity listed for the item by the unit price bid.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, bidder's address, Contractor's License Number, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified above.

Only contractors who have purchased a complete set of bid documents and by doing so have been placed on the official Planholders' List will be allowed to submit a bid on this project.

3. SUBCONTRACTS

The bidder is specifically advised that any person, firm or other party to whom it is proposed to award a subcontract under this contract must be acceptable to the Owner.

4. TELEGRAPHIC MODIFICATION

Any bidder may modify its bid by telegraphic or facsimile communication at any time prior to the scheduled time for receipt of bids, provided such telegraphic or facsimile communication is received by the Owner prior to closing time, and provided further the Owner is satisfied that a written confirmation of the telegraphic or facsimile modification over the signature of the bidder was mailed prior to the closing time. The telegraphic or facsimile communication should not reveal the bid price, but should provide the addition or subtraction or other modification so that the final prices or terms will not be known by

the Owner until the sealed bid is opened. If written confirmation is not received within two days from the closing time, no consideration will be given to the telegraphic or facsimile modification.

5. METHOD OF BIDDING

The Owner invites the following bid(s):

a. Unit Price

6. QUALIFICATION OF BIDDER

The Owner may make such investigations as is deemed necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids will not be acceptable.

7. BID SECURITY

Each bid must be accompanied by cash, certified check of the bidder, or a Bid Bond prepared on the form of bid bond attached hereto, duly executed by the bidder as principal and having as surety thereon a surety company approved by the Owner, in the amount of five percent (5%) of the bid. Cash or checks will be returned to all except the three lowest bidders within three days after the opening of bids, and the remaining cash or checks will be returned promptly after the Owner and the accepted bidder have executed the contract, or, if no award has been made within 90 days after the date of the opening of the bids, upon demand of the bidder at any time thereafter so long as bidder has not been notified of the acceptance of its bid.

8. LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT

The successful bidder, upon failure or refusal to execute and deliver the contract and bonds required within ten (10) days after they have received notice of the acceptance of their bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with the bid.

9. TIME OF COMPLETION AND LIQUIDATED DAMAGES

Bidder must agree to commence work on or before a date to be specified in a written "Notice to Proceed" of the Owner and to fully complete the project within the number of consecutive calendar days thereafter as indicated on the Bid Form. Bidder must agree also to pay as liquidated damages the sum indicated on the Bid Form for each consecutive calendar day thereafter as hereinafter provided in General Conditions.

10. CONDITIONS OF WORK

Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of the obligation to furnish all material and labor necessary to carry out the provisions of the contract. Insofar as possible, the Contractor in carrying out the work must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

11. ADDENDA AND INTERPRETATIONS

No interpretation of the meaning of the plans, specifications or other pre-bid documents will be made to any bidder orally. Each request for such interpretation should be in writing, addressed to AECOM Technical Services, Inc., 2151 Pickens Street, Suite 301 Columbia, SC 29201. To be given consideration, the request must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be mailed to all prospective bidders (at the respective addresses furnished for such purposes), no later than three days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under its bid as submitted. All addenda so issued shall become part of the contract documents.

12. SECURITY FOR FAITHFUL PERFORMANCE

Simultaneously with bidders delivery of the executed contract, the Contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor on the project under this contract, as specified in General Conditions included herein. The surety on such bond or bonds shall be a duly authorized surety company, bond shall be countersigned by an agent residing in South Carolina, and the said surety shall be satisfactory to the Owner.

13. POWER OF ATTORNEY

Attorneys-in-fact who sign bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

14. NOTICE OF SPECIAL CONDITIONS

Attention is particularly called to those parts of the contract documents and specifications that deal with the following:

(a) Inspection and testing of materials
(b) Insurance requirements
(c) Stated allowances
(d) Permits and Rights-of-way
(e) Hazardous Gas Safety (Section 01060).

15. LAWS AND REGULATIONS

The Bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

16. METHOD OF AWARD - LOWEST QUALIFIED BIDDER

If at the time this contract is to be awarded, the lowest base bid submitted by a responsible bidder does not exceed the amount of funds then estimated by the Owner as available to finance the contract, the contract will be awarded on the base bid only. If such bid exceeds such amount, the Owner may reject all bids or may award the contract on the base bid combined with such deductible alternates applied in numerical order in which they are listed in the Form of Bid, as produces a net amount which is within the available funds. The Owner will decide which is the lowest qualified bidder, and in determining such bidder, the following elements will be considered for each bidder:

(a) Maintains a permanent place of business.

(b) Has adequate plant equipment and personnel to perform the work properly and expeditiously.
(c) Has suitable financial status to meet obligations incident to the work.
(d) Has appropriate technical experience.

17. OBLIGATION OF BIDDER

At the time of the opening of bids, each bidder will be presumed to have inspected the site and to have read and be thoroughly familiar with the plans and contract documents, including all addenda. The failure or omission of any bidder to examine any form, instrument or document shall in no way relieve any bidder from any obligation in respect to its bid.

18. ORDER OF WORK

The bidder's attention is directed to Section 00800, Supplemental General Conditions, on special provisions associated with the order of completion of work.

END OF SECTION

SECTION 00311

BID FORM

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS
Phase I
FOR THE
CITY OF SUMTER

Sumter, SC
Date: _____
Project No. 60591852

PROPOSAL OF _____,

doing business as a corporation / a partnership / an individual (Strike out inapplicable terms),

with its principal office in the City of _____, County of _____,

State of _____, (hereinafter called "Bidder").

TO: City of Sumter
(hereinafter called “Owner”),

The Bidder, in compliance with your invitation for bids for the construction of Crosswell Neighborhood Stormwater Improvements – Phase 1 having examined the plans and specifications with related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project, including the availability of materials and labor, hereby proposes to furnish all labor, materials and supplies, and to construct the project in accordance with the Contract Documents, within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this proposal is a part.

Bidder hereby agrees to commence work under this contract on or before a date to be specified in written "Notice to Proceed" of the Owner and to fully complete the project within 240 calendar days thereafter as stipulated in the specifications. Bidder further agrees to pay as liquidated damages the sum of $500.00 for each consecutive calendar day thereafter as hereinafter provided in Paragraph 19 of the General Conditions.

The drawings, specifications and addenda are complementary of each other. What is called for by one shall be as binding as if called for by all. If a conflict between any of the above is discovered by the contractor, the problem shall be referred to the Engineer as soon as possible for resolution by the Engineer. Should a conflict occur which is not resolved before bid time and/or is necessary to comply with mandatory requirements (i.e., codes, ordinances, etc.), it shall be the contractor's responsibility to price and bid the more expensive method.

Bidder acknowledges receipt of the following addendum:

No.	_____	Dated	_____	No.	_____	Dated	_____
No.	_____	Dated	_____	No.	_____	Dated	_____

Bidder agrees to perform all of the _____
described in the specifications and shown on the plans for the following unit prices:

Item No.	Est Qty	Unit	Description	Unit Price	Total
1.	1	LS	Mobilization (5%)	$_____	$_____
2.	1	LS	Construction Survey	$_____	$_____
3.	1	LS	Traffic Control	$_____	$_____
4.	1	LS	Erosion Control	$_____	$_____
5.	260	LF	Water Main Relocation (parallel to new storm drainage)	$_____	$_____
6.	10	EA	Water Main Crossing	$_____	$_____
7.	20	EA	Water Meter Service Relocation	$_____	$_____
8.	14	EA	Sewer Service Relocation (above or below new storm drainage)	$_____	$_____
9.	6	EA	Sewer Service Relocation (thru new storm drainage with DIP)	$_____	$_____
10.	1	LS	Demolition	$_____	$_____
11.	1	LS	Tree Removal	$_____	$_____
12.	16	EA	Removal & Disposal of Existing Catch Basins	$_____	$_____
13.	3100	LF	Removal & Disposal of Existing Stormwater Pipe	$_____	$_____
14.	13	EA	Mailbox Relocation	$_____	$_____
15.	332	LF	Fence Relocation	$_____	$_____
16.	23	EA	Catch Basin – Yard Inlet	$_____	$_____
17.	9	EA	Catch Basin – Drop Inlet	$_____	$_____
18.	1	EA	Conflict Box	$_____	$_____
19.	1	EA	Junction Box with Lid	$_____	$_____
20.	2	EA	48” RCP Headwall	$_____	$_____
21.	52	LF	18” RCP	$_____	$_____
22.	1,630	LF	24” RCP	$_____	$_____
23.	41	LF	36” RCP	$_____	$_____
24.	381	LF	42” RCP	$_____	$_____
25.	1,928	LF	48” RCP	$_____	$_____
26.	720	SY	Asphalt Pavement Replacement	$_____	$_____
27.	90	SY	Concrete Pavement Replacement	$_____	$_____

TOTAL OF BID: $_____

The above unit prices shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for.

Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of 90 calendar days after the scheduled closing time for receiving bids.

Upon receipt of written notice of the acceptance of this bid, Bidder will execute the formal contract attached within 10 days and deliver a Surety Bond or Bonds as required by Paragraph 30 of the General Conditions. The bid security attached in the sum of _____ _____ Dollars _____ _____ Cents ($_____) is to become the property of the Owner in the event the contract and bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

By submission of this bid, each bidder certifies, and in the case of a joint bid, each party thereto certifies as to its own organization, that this bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this bid, with any other bidder or with any competitor.

[SEAL – (If bid is by a corporation)]

Respectfully submitted:

BY: _____

_____
(Print Name)

_____
(Title)

_____
(Business Address)

SECTION 00350

BID BOND

KNOW ALL MEN BY THESE PRESENTS: That we, the undersigned _____ _____ as Principal, and _____as Surety, are hereby held and firmly bound unto the City of Sumter as Owner, in the penal sum of _____ _____ Dollars _____ _____Cents ($_____), for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed this _____ day of _____, 2025.

The condition of the above obligation is such that: Whereas, the Principal has submitted to City of Sumter a certain Bid, attached hereto and by reference made a part hereof, to enter into a contract in writing for the Crosswell Neighborhood Stormwater Improvements.

NOW, THEREFORE,

(a) If said BID shall be rejected, or

(b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attachment hereto (properly completed in accordance with said BID) and shall furnish a BOND for faithful performance of said contract, and for the payment of all persons performing labor furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation shall be void; otherwise the same shall remain in force and effect - it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID, and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____
Principal (Corporate Seal)

BY: _____(L.S.)

_____
Surety (Corporate Seal)

BY: _____(L.S.)

COUNTERSIGNED (SC RESIDENT AGENT)

BY: _____

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

NOTE: Bond must be countersigned by a South Carolina resident agent.

END OF SECTION

SECTION 00500

CONTRACT

THIS AGREEMENT made this _____ day of _____, 2025, by and between City of Sumter, hereinafter called "Owner", and _____ _____, doing business as a partnership / a corporation /an individual (Strike out inapplicable terms), with its principal office in the City of _____, County of _____ _____, State of _____, hereinafter called "Contractor".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the Owner, the Contractor hereby agrees with the Owner to commence and complete the construction described as follows: Crosswell Neighborhood Stormwater Improvements – Phase I, hereinafter called the "Project", for the sum of _____ Dollars _____ Cents ($_____). Contractor further agrees to commence and complete any and all extra work in connection therewith, under the terms as stated in the General and Special Conditions of the Contract; and at his (its or their) own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendents, labor, insurance and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal and the General Conditions, Supplemental General Conditions and Special Conditions of the Contract, the plans, including all maps, plats, blueprints, and other drawings and printed or written explanatory matters thereof, the specifications and contract documents therefore as prepared by AECOM Technical Services, Inc., herein entitled the "Engineer", and as enumerated in Paragraph 1 of the Supplemental General Conditions, all of which are made a part hereof and collectively evidence and constitute the Contract.

The Contractor hereby agrees to commence work under the Contract on or before a date to be specified in written Notice to Proceed from the Owner and to fully complete the project within _____ consecutive calendar days thereafter. The Contractor further agrees to pay as liquidated damages the amount of $_____ for each consecutive calendar day thereafter that the Contractor fails to complete the project, as hereinafter provided in Paragraph 19 of the General Conditions.

The Owner agrees to pay the Contractor in current funds for the performance of the Contract, subject to additions and deductions, as provided in the General Conditions of the Contract, and to make payments on account thereof as provided in Paragraph 25, "Payments to Contractor", of the General Conditions.

IN WITNESS WHEREOF, the parties hereto have executed this contract in six counterparts, each copy of which shall be deemed an original, in the year and day first above mentioned.

(Seal)

City of Sumter
OWNER

(Signature)

By:

Title:

ATTEST:

Witness

Witness

(Corporate Seal)

CONTRACTOR

(Signature)

By:

Title:

ATTEST:

Its Secretary

Witness

CONTRACTOR'S ADDRESS

SECTION 00600

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS THAT

_____
(Name of Contractor)

_____
(Address of Contractor)

a (Corporation, Partnership or Individual), hereinafter called Principal, and

_____
(Name of Surety)

_____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

City of Sumter
(Name of Owner)

303 E. Liberty Street, Sumter, SC 29153
(Address of Owner)

hereinafter called Owner, in the penal sum of _____

_____ Dollars_____Cents ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas the Principal entered into a certain Contract with the Owner dated the ____ day of _____, 2025, a copy of which is hereto attached and made a part hereof for the construction of:

"Crosswell Neighborhood Stormwater Improvements – Phase I"

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions and agreements of said Contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety, and if he shall satisfy all claims and demands incurred under such contract and fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extensions of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change,

extension of time, alteration or addition to the terms of the Contract or to the work or to the specifications.

PROVIDED FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in six (6) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 2025.

Signed, sealed and delivered in
the presence of:

_____
Principal – Contractor

_____ By: _____

_____ _____
As to Principal Title

_____
Surety

By: _____
Attorney-In-Fact
(Power of Attorney to be Attached)

_____ By: _____
Resident Agent

_____ _____
As to Surety Resident Agent Company Name

_____
Resident Agent Company Address

_____

_____

NOTES:

1. Date of Bond must not be prior to date of Contract.
2. If Contractor is a Partnership, all partners should execute bond.
3. Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

SECTION 00601

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS THAT

_____
(Name of Contractor)

_____
(Address of Contractor)

a (Corporation, Partnership or Individual) , hereinafter called Principal, and

_____
(Name of Surety)

_____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

City of Sumter
(Name of Owner)

303 E. Liberty Street, Sumter, SC 29153
(Address of Owner)

hereinafter called Owner, in the penal sum of _____

_____ Dollars_____Cents ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas the Principal entered into a certain Contract with the Owner dated the_____day of_____, 2025, a copy of which is hereto attached and made a part hereof for the construction of:

"Crosswell Neighborhood Stormwater Improvements – Phase I"

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, subcontractors and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extensions of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the specifications.

PROVIDED FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in six (6) counterparts, each one of which shall be deemed an original, this the _____day of_____, 2025.

Signed, sealed and delivered in
the presence of:

_____
Principal – Contractor

_____ By: _____

_____ _____
As to Principal Title

_____
Surety

By: _____
Attorney-In-Fact
(Power of Attorney to be Attached)

_____ By: _____
Resident Agent

_____ _____
As to Surety Resident Agent Company Name

_____
Resident Agent Company Address

_____
Resident Agent Address

NOTES:

1. Date of Bond must not be prior to date of Contract.
2. If Contractor is a Partnership, all partners should execute bond.
3. Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

SECTION 00602.4

NOTICE OF AWARD

TO:

PROJECT DESCRIPTION: Crosswell Neighborhood Stormwater Improvements – Phase I

The Owner has considered the bid dated _____, 20___ submitted by you for the above described work in response to its Advertisement for Bids and its Information for Bidders.

You are hereby notified that your bid has been accepted for items in the amount of $___ _____.

You are required by the Information for Bidders to execute the Agreement and furnish the required Contractor's performance bond, payment bond and certificates of insurance within ten (10) calendar days from the date of this notice to you. If you fail to execute said agreement and to furnish said bonds within ten (10) days from the date of this notice, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your bid as abandoned and as a forfeiture of your bid bond. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the Owner.

Dated this _____ day of _____, 20___.

City of Sumter
Owner

_____
(Signature)

By: _____
(Print Name)

Title: _____

Acceptance of Notice

Receipt of the above Notice of Award is hereby acknowledged by _____ _____, this the _____ day of _____, 20___.

By: _____

Title: _____

AECOM

00603

CONTRACT CHANGE ORDER

AECOM Technical Services, Inc.
Telephone (803) 254-4400 Fax (803) 845-4837
2151 Pickens Street, Suite 301
Columbia, South Carolina 29201

Date:

Project: Crosswell Neighborhood Stormwater Improvements – Phase I

Change Order No.:

Contract No.:

AECOM Technical Services, Inc. Project No.: 60591852

Description of and Reason for Change:

_____

_____

_____

_____

Itemization of Proposed Change and Basis for Payment

Original Contract Price	$ _____
Previous Change Orders	$ _____
This Change, (An Addition) (A Deduction) of	$ _____
Proposed Revised Contract Price	$ _____

Additional funds are to be provided in the following manner: _____

_____

Extension of Contract Time Required: _____ Days.

Revised Contract Completion Date: _____.

Requested: _____, Contractor

By:_____Date:_____

Recommended: AECOM Technical Services, Inc., Engineers

By:_____Date:_____

Approved: City of Sumter, Owner

By:_____Date:_____

SECTION 00604

EMPLOYMENT ELIGIBILITY VERIFICATION REQUIREMENTS

A. Contractor is required to comply with all applicable State and Federal employment eligibility verification requirements including but not limited to the following:

1. By signing its bid or proposal, Contractor certifies that it will comply with the applicable requirements of Title 41, Chapter 8 of the South Carolina Code of Laws and agrees to provide to the City of Sumter upon request any documentation required to establish either: (a) that Title 41, Chapter 8 is inapplicable both to Contractor and its subcontractors or sub-subcontractors; or (b) that Contractor and its subcontractors or sub-subcontractors are in compliance with Title 41, Chapter 8. Pursuant to Section 41-8-70, "In addition to other penalties provided by law, 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." Contractor agrees to include in any contracts with its subcontractors language requiring its subcontractors to (a) comply with the applicable requirements of Title 41, Chapter 8, and (b) include in their contracts with the sub-subcontractors language requiring the sub-subcontractors to comply with the applicable requirements of Title 41, Chapter 8.

B. Contractor is required to complete and submit the attached affidavit along with the executed contract documents.

C. E-Verify.

1. In addition to completing and maintaining the federal employment eligibility verification form (Form I-9), Contractor must, within three business days after employing a new employee, verify the employee's work authorization through the E-Verify federal work authorization program administered by the U.S. Department of Homeland Security. Employers may no longer confirm a new employee's employment authorization with a driver's license or state identification card.

2. Contractor shall enroll in E-Verify at www.dhs.gov/e-verify.

END OF SECTION

Attachment

CONTRACTOR AFFIDAVIT
SOUTH CAROLINA ILLEGAL IMMIGRATION REFORM ACT (Amended)

In accordance with the requirements of the South Carolina Illegal Immigration Reform Act, _____(Contractor)_____ hereby certifies that it is currently in compliance with the requirements of Title 41, Chapter 8 of the S. C. Code Annotated and will remain in compliance with such requirements throughout the term of its contract with the City of Sumter.

The Contractor hereby acknowledges that in order to comply with requirements of S. C. Code Annotated Section 41-8-20:

(A) All private employers in South Carolina shall be imputed a South Carolina employment license, which permits a private employer to employ a person in this State. A private employer may not employ a person unless the private employer's South Carolina employment license and any other applicable licenses as defined in Section 41-8-10 are in effect and are not suspended or revoked. A private employer's employment license shall remain in effect provided the private employer complies with the provisions of this chapter.

(B) All private employers who are required by federal law to complete and maintain federal employment eligibility verification forms or documents must register and participate in the E-Verify federal work authorization program, or its successor, to verify the work authorization of every new employee within three business days after employing a new employee. A private employer who does not comply with the requirements of this subsection violates the private employer's licenses.

(C) The South Carolina Department of Employment and Workforce shall provide private employers with technical advice and electronic access to the E-Verify federal work authorization program's website for the sole purpose of registering and participating in the program.

(D) Private employers shall employ provisionally a new employee until the new employee's work authorization has been verified pursuant to this section. A private employer shall submit a new employee's name and information for verification even if the new employee's employment is terminated less than three business days after becoming employed. If a new employee's work authorization is not verified by the federal work authorization program, a private employer must not employ, continue to employ, or reemploy the new employee.

(E) To assist private employers in understanding the requirements of this chapter, the director shall send written notice of the requirements of this section to all South Carolina employers, and shall publish the information contained in the notice on its website. Nothing in this section shall create a legal requirement that any private employer receive actual notice of the requirements of this chapter through written notice from the director, nor create any legal defense for failure to receive notice.

(F) If a private employer is a contractor, the private employer shall maintain the contact phone numbers of all subcontractors and sub-subcontractors performing services for the private employer. The private employer shall provide the contact phone numbers or a contact phone number, as applicable, to the director pursuant to an audit or investigation within seventy-two hours of the director's request.

The Contractor agrees to provide to the City of Sumter upon request any documentation required to establish the applicability of the South Carolina Illegal Immigration Reform Act (Amended) to the contractor, subcontractor or sub-subcontractor. The Contractor further agrees that it will upon request provide the City of Sumter with any documentation required to establish that the contractor and any subcontractors or sub-subcontractors are in compliance with the requirements of Title 41, Chapter 8 of the S. C. Code Annotated.

Date:_____ By:_____
Contractor

Title:_____

SECTION 00606.5

NOTICE TO PROCEED

TO: _____ DATE:_____

_____

_____

PROJECT DESCRIPTION: Crosswell Neighborhood Stormwater Improvements – Phase I

OWNER: City of Sumter

City of Sumter Bid Number: ITB#38-24/25

AECOM PROJECT NO: 60591852

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 2025, on or before _____, 2025, and you are to complete the WORK within 240 consecutive calendar days thereafter.

The date of completion of all work is therefore: _____, 2025.

AECOM Technical Services, Inc.

By: _____

_____

Title: _____

Acceptance of Notice

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by _____ _____ this the ____ day of _____, 2025.

By: _____

Title: _____

SECTION 00607.3

APPLICATION FOR PAYMENT

Contractor may submit other Pay Request form for Engineer approval in lieu of the following:

Owner: City of Sumter

Contractor:

Contract No.

Pay Estimate No.

Period of Estimate: From _____ to _____

CONTRACT CHANGE ORDER SUMMARY

No.	Approval Date	Additions	Deductions
	Totals:		
	Net Change:		

ESTIMATE

1. Original Contract	$
2. Change Orders	$
3. Revised Contract (1+2)	$
4. Work Completed*	$
5. Stored Materials*	$
6. Subtotal (4+5)	$
7. Retainage	$
8. Previous Payments	$
9. Amount Due (6-7-8)	$

** Detailed breakdown attached*

CONTRACT TIME

Original (days): _____

Revised: _____

Remaining: _____

On Schedule: Yes____ No ____

Starting Date: _____

Projected Completion: _____

Contractor's Certification:

The undersigned certifies that to the best of their knowledge, information and belief the work covered by this payment estimate has been completed in accordance with the contract documents, that all amounts due subcontractors and suppliers have been paid by the Contractor for work for which previous payment estimates were issued and payments received from the Owner, and that the current payment shown herein is now due.

(Signature): _____

By: _____

Date: _____

Engineer's Certification:

The undersigned certifies that to the best of their knowledge and belief, the quantities shown in this estimate are correct and the work has been performed in accordance with the contract documents. Based on periodic but less that full time field representation, to the best of our information the quantities, items and schedule of values, work completed and material and equipment delivered are accurate as indicated on this request for payment. Some defects or problems with construction items may not be determined until final testing and operation of the system is performed. The Engineer cannot be held liable for approval for partial payments for the installation of these items from which the evidence of defects or problems were not determined until after the request for payment was approved.

AECOM TECHNICAL SERVICES, INC.

(Signature):

By: _____

Date: _____

Approved by Owner:

(Signature): _____

By: _____

Date: _____

PAY ESTIMATE NO. _____ DATE _____

Page ___ of ___

PROJECT: Crosswell Neighborhood Stormwater Improvements – Phase I **ENGINEER'S PROJECT NUMBER: 60591852**

					ACTUAL QUANTITIES			
Item No.	Contract Qty.	Unit	Description	Unit Price	Current	Previous	Total	Extension
						PAGE SUB-TOTAL:		
TOTAL:								

SECTION 00690

CONTRACTOR'S AFFIDAVIT

The State of _____ Date: _____

The County of _____

The City/Town of _____

_____ of _____
(Officer's Name) (Officer's Title) (Contractor's Name)

being duly sworn, deposes and says that _____
(Contractor's Name)

has furnished all labor and material entering into the _____

_____ at _____
(Kind of Work) (Name and Location of Plant or Work)

called for in the Contract Documents dated _____ with _____

_____ .
City of Sumter
(Owner's Name)

_____ states further that this officer has full knowledge
(Contractor's Name)
of all obligations for such labor and materials which have entered into and become part of that certain project known and designated above, and that this officer further deposes and says that all debts and other obligations for such labor and materials have been fully and completely paid for in good and lawful money of the United States of America and that there are no suits for damages against them proceeding, prospective and/or that there are no suits for damages against them proceeding, prospective, or otherwise, in consequence of their operations on the above said project.

The said _____ will hold the Owners,
(Contractor's Name)

City of Sumter blameless of any and all mechanic's liens that may be hereafter entered or filed for record, so as to constitute charge against said premises for work or labor done or materials furnished by them.

IN WITNESS HEREOF, this officer has heretofore put his hand and seal:

_____ (Seal)
(Officer's Name)

I, _____, Notary Public in and for the above named County and State do hereby certify that _____ personally known to me to be the affiant in the
(Officer's Name)
foregoing Affidavit, personally appeared before me this day and, having been duly sworn, deposes and says that the facts set forth in the above Affidavit are true and correct.

WITNESS my hand and seal this ____ day of _____, 2025.

_____ (Seal)

Notary Public for the State of _____
My Commission Expires: _____

SECTION 00700

GENERAL CONDITIONS

1. CONTRACT AND CONTRACT DOCUMENTS. The plans, specifications and addenda, hereinafter enumerated in Paragraph 1 of Supplemental General Conditions, shall form part of this contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The table of contents titles, heading, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the contract documents and in no way affect, limit or cast light on the interpretations of the provisions to which they refer.

Contents

2. DEFINITIONS. The following terms as used in this contract are respectively defined as follows:

(a) Contractor. A person, firm or corporation with whom the contract is made by the Owner.

(b) Subcontractor. A person, firm or corporation supplying labor and materials, or only labor, for work at the site of the project for and under separate contract or agreement with the Contractor.

(c) Work on or at the Project. Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the Contractor and any Subcontractor.

3. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS. The Contractor will be furnished additional instructions and detail drawings as necessary to carry out the work included in the Contract. The additional drawings and instructions thus supplied to the Contractor will coordinate with the Contract Documents and will be so prepared that they can be reasonably interpreted as part thereof. The Contractor shall carry on the work in accordance with the additional detail drawings and instructions. The Contractor and the Engineer will prepare jointly:

(a) A schedule fixing the dates at which special detail drawings will be required; such drawings, if any, to be furnished by the Engineer in accordance with said schedule; and

(b) A schedule fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing and installation of materials, supplies, and equipment, and the completion of the various parts of the work; each such schedule to be subject to change from time to time in accordance with the progress of the work.

4. SHOP DRAWINGS AND SAMPLES. Submit to the Engineer for approval, in accordance with the requirement of Section 01340.

4.1 Samples. Contractor shall also submit to the Engineer for approval, all samples required by Section 01340. All samples will have been checked by and stamped with the approval of the Contractor, identified clearly as to material, manufacturer, any pertinent catalog numbers and the use for which intended.

4.2 Deviations. At the time of each submission, Contractor shall in writing call the Engineer's attention to any deviations that the Shop Drawings or samples may have from the requirements of the Contract Document.

4.3 Engineer's Review. Engineer will review and approve with reasonable promptness Shop Drawings and samples, but his review and approval shall be only for conformance with the design concept of the project and for compliance with the information given in the Contract Documents. The approval of a separate item as such will not indicate approval of the assembly in which the item functions. Contractor shall make any corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and resubmit new samples until approved. Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections called for by Engineer on previous submissions. Contractor's stamp of approval on any Shop Drawing or sample shall constitute a representation to Owner and Engineer that Contractor has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers and similar data or he assumes full responsibility for doing so, and that he has reviewed or coordinated each Shop Drawing or sample with the requirements of the work and Contract Documents.

4.4 Contractor's Records. Where a Shop Drawing or sample submission is required by the Specifications, no related work shall be commenced until the submission has been approved by Engineer. A copy of each approved shop drawing and each approved sample shall be kept in good order by Contractor at the site and shall be available to Engineer.

4.5 Contractor's Responsibility. Engineer's approval of Shop Drawings or sample shall not relieve Contractor from his responsibility for any deviations from the requirements of the Contract Documents unless Contractor has in writing called the Engineer's attention to such deviation at the time of submission and Engineer has given written approval to the specific deviation, nor shall any approval by Engineer relieve Contractor from responsibility for errors or omissions in the Shop Drawings.

5. MATERIALS, SERVICES AND FACILITIES shall be furnished by the Contractor.

(a) It is understood that except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, gas lights, power, transportation, superintendence, taxes, insurance, temporary construction of every nature, and all other services and facilities of every nature whatsoever necessary to execute, complete and deliver the work within the specified time.

(b) Any work necessary to be performed after regular working hours, on Sundays, or legal holidays, shall be performed without additional expense to the Owner.

6. CONTRACTOR'S TITLE TO MATERIALS. No materials or supplies for the work shall be purchased by the Contractor or by any subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies used by him in the work, free from all liens, claims or encumbrances.

7. INSPECTION AND TESTING OF MATERIALS. Unless otherwise specifically provided for in the specifications, the inspection and testing of material and finished articles to be incorporated in the work at the site shall be made by bureaus, laboratories, or agencies approved by the Owner. The Owner will pay for initial testing services requested by the Owner. When initial tests indicate non-compliance with the Contract Documents, the costs of initial tests associated with that non-compliance will be deducted from the Contract sum. Subsequent re-testing occasioned by the non-compliance shall be performed by the same testing agency and all costs there from will be deducted by the Owner from the contract sum.

7.1 Certification by Contractor. Where the detailed specifications call for certified copies of mill or shop tests to establish conformance of certain materials with the specifications, it shall be the responsibility of the Contractor to assure delivery of such certifications to the Owner. No materials or finished articles shall be incorporated in the work until such materials and finished articles have passed the required tests. The Contractor shall promptly segregate and remove rejected material and finished articles from the site of the work.

7.2 Guaranty. The testing and approval of materials by the laboratory, or laboratories, shall not relieve the Contractor of any of his obligations to fulfill his contract and guarantee of workmanship and materials as called for in paragraph entitled "General Warranty for One Year After Completion of Contract" herein. The Contractor may, at his option and at his own expense, cause such other tests to be conducted as he may deem necessary to assure suitability, strength and durability of any material or finished article.

8. "OR EQUAL" CLAUSE. The phrase "or equal" shall be construed to mean that material or equipment will be acceptable only when, in the judgment of the Engineer, they are composed of parts of equal quality, or equal workmanship and finish, designed and constructed to perform or accomplish the desired result as efficiently as the indicated brand, pattern, grade, class, make or model. Written approval will be obtained from the Engineer prior to installation.

9. PATENTS. The Contractor shall hold and save the Owner and its officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents. If the Contractor uses any design, device or material covered by letter, patent, or copyright, he shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, device or material. It is mutually agreed and understood that, with exception, the contract prices shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The Contractor and/or his

sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringements by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract, and shall indemnify the Owner for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

10. SURVEYS, LAWS AND REGULATIONS. The Contractor shall comply with the following:

10.1 Construction staking shall be in accordance with the requirements of Section 01050 entitled "Field Engineering".

10.2 Laws and Regulations. The Contractor shall keep himself fully informed of all laws, ordinances and regulations of State, City and County in any manner affecting those engaged or employed in the work, or the materials used in the work, or in any way affecting the conduct of the work, and of all orders and decrees of bodies or tribunals having any jurisdiction or authority over same. If any discrepancy or inconsistency should be discovered in this contract, or in the drawings or specifications herein referred to, in relation to any such law, ordinance, regulation, order or decree, he shall forthwith report the same in writing to the Owner. He shall, at all times, himself observe and comply with all such existing and future laws, ordinances and regulations (to the extent that such requirements do not conflict with Federal laws or regulations) and shall protect and indemnify the Owner and its agents against any claims or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree, whether by himself or by his employees.

11. CONTRACTOR'S OBLIGATIONS. The Contractor shall, in good workmanlike manner, do and perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary or proper to perform and complete all the work required by this contract, within the time herein specified, in accordance with provisions of this contract and said specifications, and in accordance with the plans and drawings covered by this contract and any and all supplemental plans and drawings and in accordance with the directions of the Engineer as given from time to time during the progress of the work. He shall furnish, erect, maintain and remove such construction plant and such temporary works as may be required. The Contractor shall observe, comply with, and be subject to all terms, conditions, requirements and limitation of the contract and specifications, and shall do, carry on and complete the entire work to the satisfaction of the Engineer and the Owner.

12. WEATHER CONDITIONS. In the event of temporary suspension of work or during inclement weather, or whenever the Engineer shall direct, the Contractor will, and will cause his subcontractors to, protect carefully his and their work and materials against damage or injury from the weather. If, in the opinion of the Engineer, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any of his Subcontractors to so protect its work, such materials shall be removed and replaced at the expense of the Contractor.

13. PROTECTION OF WORK AND PROPERTY, EMERGENCY. The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this contract. He shall at all times safely guard and protect his own work and that of adjacent property from damage. The Contractor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in the contract or by the Owner or by his duly authorized representatives. In case of emergency which threatens loss or injury of property and/or safety of life, the Contractor will be allowed to act, without previous instructions from the Engineer, in a diligent manner. He shall notify the Engineer immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted to the Engineer for approval. Where the Contractor has not taken action but has notified the Engineer of an emergency threatening injury to persons or damage to the work of any adjoining property, he shall act as instructed or

authorized by the Engineer. The amount of reimbursement claimed by the Contractor on account of any emergency action shall be determined in the manner provided in paragraph entitled "Changes in Work" of these specifications.

14. INTERPRETATIONS. If any person contemplating submitting a bid for the proposed contract is in doubt as to the true meaning of any part of these proposed contract documents, he may submit to the Engineer a written request for an interpretation thereof. The person submitting the request will be responsible for its prompt and actual delivery. Any interpretation of such documents will be made only by addendum duly issued, and a copy of such addendum will be mailed or delivered to each person receiving a set of such documents. The Owner will not be responsible for any other explanation or interpretation of such documents which anyone presumes to make on behalf of the Owner before expiration of the ultimate time set for the receipt of bids.

15. REPORTS RECORDS AND DATA. The Contractor shall submit to the Owner such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this contract.

16. SUPERINTENDENCE BY CONTRACTOR. The Contractor shall employ only competent and skilled men on the work. The Contractor shall have competent Superintendent or Foreman present at all times when the work is in progress, who shall have full authority to act for the Contractor. It is understood that such representative shall be acceptable to the Engineer and shall be one who can be continued in that capacity for the particular job involved unless he ceases to be on the Contractor's payroll. The Contractor shall, upon demand from the Engineer, immediately remove any superintendent, foreman or workman whom the Engineer may consider incompetent or undesirable.

17. CHANGES IN WORK. No changes in the work covered by the approved contract documents shall be made without having prior written approval of the Owner. Charges or credits for the work covered by the approved change shall be determined by one or more, or a combination of, the following methods:

    (a) Unit bid prices previously approved.

    (b) An agreed lump sum.

    (c) The actual cost of:

        1. Labor, including foremen.
        2. Materials entering permanently into the work.
        3. The ownership or rental cost of construction plant and equipment during the time of use on the extra work.
        4. Power and consumable supplies for the operation of power equipment.
        5. Insurance.
        6. Social security and old age and unemployment contributions.

    To the cost under (c) there shall be added a fixed fee to be agreed upon but not to exceed 15 percent of the estimated cost of the work. The fee shall be compensation to cover the cost of supervision, overhead, bond, profit and any other general expenses.

18. EXTRAS. Without invalidating the contract, the Owner may order extra work or make changes by altering, adding to or deducting from the work, the contract sum being adjusted accordingly, and the consent of the surety being first obtained where necessary or desirable. All the work of the kind bid upon shall be paid for at the price stipulated in the proposal, and no claims for any extra work or materials shall be allowed unless the work is ordered in writing by the Owner, or the Engineer acting officially for the Owner, and the

price is stated in such order. Extra work shall be performed only upon the execution of authorized change orders as set forth in the preceding paragraph.

19. TIME FOR COMPLETION AND LIQUIDATED DAMAGES. It is hereby understood and mutually agreed by and between the Contractor and the Owner that the date of beginning and the time for completion as specified in the contract of the work to be done hereunder are essential conditions of this contract; and it is further mutually understood and agreed that the work embraced in this contract shall be commenced on a date to be specified in the Notice to Proceed.

19.1 Regular Prosecution of Work. The Contractor agrees that said work shall be prosecuted regularly, diligently and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for completion of the work described herein is a reasonable time for completion of same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

19.2 Liquidated Damages. If the Contractor shall neglect, fail, or refuse to complete the work within the time herein specified, or any proper extensions thereof granted by the Owner, then the Contractor does hereby agree, as a part consideration for the awarding of this contract, to pay to the Owner the amount specified in the contract not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the contract for completing the work. The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticality and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.

19.3 Extensions of Time for Completion. It is further agreed that time is of the essence of each and every portion of this contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the contractor an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this contract. Provided, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

(a) To any preference, priority or allocation order duly issued by the Government.

(b) To unforeseeable cause beyond the control and without the fault or negligence of the Contractor including, but not restricted to, acts of the public enemy, acts of the Owner, acts of another contractor in the performance of a contract with the Owner; fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, hurricanes, tornadoes; and

(c) To any delays of subcontractors or suppliers occasioned by any of the causes specified in subsections (a) and (b) of this article.

Provided, further that the Contractor shall, within seven (7) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, notify the Owner in writing of the causes of delay, who shall ascertain the facts and extent of delay and notify the Contractor within a reasonable time of its decision in the matter, and grant such extension of time as the Owner shall deem suitable and just.

Normal weather conditions for the project area are taken into consideration in the time for completion of the contract; therefore, no extension of time will be extended for normal weather conditions, with the exception of hurricanes and tornadoes.

20. CORRECTION OF WORK. All work, all materials, whether incorporated in the work or not, all processes of manufacturer, and all methods of construction, shall be at all times and places subject to the inspection of the Engineer, who shall be the final judge of the quality and suitability of the work, materials, processes of manufacture, and methods of construction of the purposes for which they are used. Should they fail to meet his approval, they shall be forthwith reconstructed, made good, replaced and/or corrected, as the case may be, by the Contractor at his own expense. Rejected material shall immediately be removed from the site. If, in the opinion of the Engineer, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the contract documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as, in the judgment of the Engineer, shall be equitable.

21. SUBSURFACE CONDITIONS FOUND DIFFERENT. Should the Contractor encounter subsurface and/or latent conditions at the site materially differing from those shown on the plans or indicated in the specifications, he shall immediately give notice to the Engineer of such conditions before they are disturbed. The Engineer will thereupon promptly investigate the conditions, and if he finds that they materially differ from those shown on the plans or indicated in the specifications, he will at once make such changes in the plans and/or specifications as he may find necessary; any increase or decrease of cost resulting from such changes to be adjusted in the manner provided in paragraph 17 of these specifications.

    (a) Where no specific subsurface conditions are indicated or specified, no increase in cost will be considered in regards to subsurface conditions encountered.

22. CLAIMS FOR EXTRA COSTS. No claim for extra work or cost shall be allowed unless the same was done in pursuance of a written order of the Engineer, as aforesaid, and the claim presented with the first estimate after the changes or extra work is done. When work is performed under the terms of subparagraph 17(c) of these specifications, the Contractor shall furnish satisfactory bills payrolls and vouchers covering all items of cost and when requested by the Owner, give the Owner access to accounts relating thereto.

23. RIGHT OF OWNER TO TERMINATE CONTRACT. In the event that any of the provisions of this contract are violated by the Contractor or by any of his subcontractors, the Owner may serve written notice upon the Contractor and the surety of its intention to terminate the contract, such notices to contain the reasons for such intention to terminate the contract, and unless within 10 days after the serving of such notice upon the Contractor, such violation or delay shall cease and satisfactory arrangement or correction be made, the contract shall, upon the expiration of said 10 days, cease and terminate. In the event of any such termination, the Owner shall immediately serve notice thereof upon the surety and the Contractor, and the surety shall have the right to take over and perform the contract; provided, however, that if the surety does not commence performance thereof within 10 days from the date of the mailing to such surety of notice of termination, the Owner may take over the work and prosecute same to completion by the contract or by force account for the account and at the expense of the Contractor, and the Contractor and his surety shall be liable to the Owner for any excess cost occasioned thereby, and in such event the Owner may take possession of and utilize in completion the work such materials, appliances and plant as may be on the site of the work and necessary therefore. If the Contractor should die, be declared an incompetent, be declared bankrupt or insolvent, make an assignment for the benefit of creditors during the term of his contract, the Owner may terminate the contract in the manner and under the procedure set forth above with the exception that no notices to the Contractor shall be required, but in lieu thereof the Owner must make a reasonable effort to notify the estate of the Contractor, his guardian, assignee, or legal representative of the intention to terminate and fact of termination, if there is any such guardian, assignee, or legal representative at the time the Owner desires to terminate.

24. CONSTRUCTION SCHEDULE AND PERIODIC ESTIMATES. Immediately after execution and delivery of the contract and before the first partial payment is made, the Contractor shall deliver to the Owner an estimated construction progress schedule in form satisfactory to the Owner, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the contract documents and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the progress schedule.

24.1 Contractor's Estimate. The Contractor shall also furnish:

(a) A detailed estimate, giving a complete breakdown of the contract price; and

(b) Periodic itemized estimates of work done for the purpose of making partial payments thereon. The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for addition to or deductions from the contract price.

24.2 Equipment Delivery Schedule. The Contractor shall also prepare a schedule of anticipated shipping dates for materials and equipment. It is intended that equipment and materials be so scheduled as to arrive at the job site just prior to time for installation to prevent excessive materials on hand for inventory and the necessity for extensive storage facilities at the job site.

25. PAYMENTS TO CONTRACTOR shall be made according to the following:

(a) Payments to the Contractor will be made within thirty (30) days upon receipt of a duly certified approved estimate of the work performed during the preceding calendar month under this contract, but to insure the proper performance of this contract, the Owner will retain a portion of each estimate until final completion and acceptance of all work covered by this contract in accordance with the following:

1) Retention of up to 10% of payment claimed until construction is complete, or as follows;
2) After construction is 50% complete, 10% of the 50% completion portion will be retained and no additional retainage will be withheld, provided that the contractor is making satisfactory progress and there is no specific cause for greater withholding.
3) When the project is substantially complete (operational or beneficial occupancy), the retained amount may be further reduced to only that amount necessary to assure completion.
4) The Owner will accept a cash bond or irrevocable letter of credit if offered in lieu of cash retainage under (2), and will accept a cash bond or irrevocable letter of credit if offered in lieu of cash retainage under (3).
5) The Owner may reinstate up to ten (10) percent retainage if the Owner determines, at its discretion, that the contractor is not making satisfactory progress or there is other specific cause for such retainage.

(b) In preparing estimates, the material delivered on the site and preparatory work done may be taken into consideration.

(c) All material and work covered by partial payments shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of materials and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the right of the Owner to require the fulfillment of all the terms of the contract.

25.1 Owner's Right to Withhold Certain Amounts and Make Application Thereof. The Contractor agrees that he will indemnify and save the Owner harmless from all claims growing out of the lawful demands of subcontractors, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this contract. The Contractor shall, at the Owner's request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged, or waived. If the Contractor fails so to do, then the Owner may, after having served written notice on the contractor, either pay unpaid bills, of which the Owner has written notice, direct, or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed in accordance with the terms of this contract, but in no event shall the provisions of this sentence be construed to impose any obligations upon the Owner to either the Contractor or his surety. In paying any unpaid bills of the Contractor, the Owner shall be deemed the agent of the Contractor, and any payment so made by the Owner shall be considered as a payment made under the contract by the Owner to the Contractor, and the Owner shall not be liable to the Contractor for any such payment made in good faith.

26. ACCEPTANCE OF WORK AND FINAL PAYMENT. Before final acceptance of the work and payment to the Contractor of the percentage retained by the Owner, the following requirements shall be complied with:

(a) Final Inspection. Upon notice from the Contractor that his work is completed, the Engineer will make a final inspection of the work and shall notify the Contractor of all instances where his work fails to comply with the contract drawings and specifications, as well as any defects he may discover. The Contractor shall immediately make such alterations as are necessary to make the work comply with the contract drawings and specifications, and to the satisfaction of the Engineer.

(b) Operating Test. After the alterations for compliance with the contract drawings and specifications have been made, and before acceptance of the whole or any part of the work, it shall be subjected to test to determine that it is in accordance with the contract drawings and specifications. The Contractor shall maintain all work in first class condition for a thirty (30) day operating period after the work has been completed as a whole, the final inspection has been made, and the Engineer has notified the Contractor in writing that the work has been finished to his satisfaction. The retained percentage as provided herein will not become due or payable to the Contractor until after the thirty (30) day operating period has expired.

(c) Cleaning Up. Before the work is considered as complete, all rubbish and unused material due to or connected with the construction must be removed and the premises left in a condition satisfactory to the Owner. Streets, curbs, crosswalks, pavements, sidewalks, fences and other public and private property disturbed or damaged should be restored to their former condition. Final acceptance will be withheld until such work is finished.

(d) Liens. Final acceptance of the work will not be granted and the retained percentage will not be due or payable until the Contractor has furnished the Owner proper and satisfactory evidence under oath that all claims for labor and material employed or used in the construction of the work under this contract have been settled, and that no legal claims can be filed against the Owner for such labor or material.

(e) Final Estimate. Upon completion of all cleaning up, alterations and repairs required by the final inspection or operating test, the satisfactory completion of the operating test, and upon submitting proper and satisfactory evidence to the Owner that all claims have been settled, the Contractor shall then prepare his final estimate. After

review and approval of the final estimate by the Engineer and the Owner, the payment shall then become due.

27. ACCEPTANCE OF FINAL PAYMENT AS RELEASE. The acceptance by the Contractor of final payment shall be and shall operate as a release to the owner of all claims and all liability to the Contractor for all things done or furnished in connection with this work and for every act and neglect of the Owner and others relating to or arising out of this work. No payment, final or otherwise, shall operate to release the Contractor or his sureties from any obligations under this Contract or his sureties from any obligations under this contract or the performance and payment bond.

28. PAYMENTS BY CONTRACTOR. The Contractor shall pay:

(a) For all transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered;

(b) For all materials, tools, and other expendable equipment to the extent of ninety (90) percent of the cost thereof not later than the 20th day of the calendar month following that in which such materials, tools, and equipment are delivered at the site of the project, and the balance of the cost thereof not later than the 30th day following completion of that part of the work in or on which such materials, tools, and equipment are incorporated or used; and

(c) To each of his subcontractors not later than the 5th day following each payment to the Contractor, the respective amounts allowed the Contractor on account of the work performed by his subcontractors to the extent of each subcontractor's interest therein.

29. INSURANCE. The Contractor shall procure and shall maintain during the life of this contract, whether such operation be by himself or by a subcontractor or anyone directly or indirectly employed by either of them, such insurance as required by statute and/or ordinance to adequately protect the Owner from any claims or damages, including bodily injury or death, which may arise from them during operations under this contract.

29.1 Limits of Liability. Insurance shall be obtained for not less than the limits of liability as specified in Section 00800 entitled Supplemental General Conditions.

29.2 Certificates of Insurance. The Contractor shall furnish the Owner, if requested, certificates showing the type, amount, class of operations covered, effective dates and dates of expiration of the policies. Such certificates shall contain substantially the following statement: "The insurance covered by this certificate will not be cancelled or materially altered except after 30 days written notice has been received by the Owner".

30. CONTRACT SECURITY. The Contractor shall furnish a 100 percent performance bond and a 100 percent payment bond as security for the faithful performance of this contract, as security for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract. The performance bond and payment bond shall be in separate instruments. Before the final acceptance, each bond must be approved by the Owner.

31. ASSIGNMENTS. The Contractor shall not assign the whole or any part of this contract or any moneys due or to become due hereunder without written consent of the Owner. In case the Contractor assigns all or any part of any moneys due or to become due under this contract, the instrument of assignment shall contain a clause substantially to the effect that is agreed that the right of the assignee in and to any moneys due or to become due to the Contractor shall be subject to prior claims of all persons, firms and corporations for services rendered or materials supplied for the performance of the work called for in this contract.

32. MUTUAL RESPONSIBILITY OF CONTRACTORS. If through acts of neglect on the part of the Contractor, any other contractor or any subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other contractor or subcontractor by agreement or arbitration. If such other contractor or subcontractor shall assert any claim against the Owner on account of any damage alleged to have been sustained, the Owner shall notify the Contractor, who shall indemnify and save harmless the Owner against any such claim.

33. SEPARATE CONTRACTS. The Contractor shall coordinate his operations with those of other contractors. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work. The Contractor, including his subcontractor, shall keep informed of the progress and the detail work of other contractors and shall notify the Engineer immediately of lack of progress or defective workmanship on the part of other contractors. Failure of a contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by him of the status of the work as being satisfactory for proper coordination with his own work.

34. SUBCONTRACTING shall comply with the following:

(a) The Contractor may utilize the services of specialty contractors on those parts of the work that under normal contracting practices are performed by specialty subcontractors.

(b) The Contractor shall not award any work to any subcontractor without prior written approval of the Owner, which approval will not be given until the Contractor submits to the Owner a written statement concerning the proposed award to the subcontractor, which statement shall contain such information as the Owner may require.

(c) The Contractor shall be as fully responsible to the Owner for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons employed by him.

(d) The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and other contract documents insofar as applicable to the work of subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Contract under any provisions of the contract documents.

(e) Nothing contained in this contract shall create any contractual relation between any subcontractor and the Owner.

35. ENGINEER'S AUTHORITY. The Engineer shall determine the amount, quality, acceptability and fitness of the several kinds of work and materials which are to be paid for under this contract and shall decide all questions which may arise in relation to said work and the construction thereof. The Engineer's estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties hereto relative to said contract or specifications, the determination or decision of the Engineer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this contract affected in any manner or to any extent by such question.

35.1 Interpretation of Drawings and Specifications. The Engineer shall decide the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found obscure or be in dispute. Any differences or conflicts in regard to their work that

may arise between the Contractor under this contract and other contractors performing work for the Owner shall be adjusted and determined by the Engineer.

36. STATED ALLOWANCES. The Contractor shall include in his proposal the cash allowances stated in Section 01021. The Contractor shall purchase the "Allowed Material" by soliciting not less than three bids as directed by the Owner. If the actual price for purchasing the "Allowed Materials" is more or less than the "Cash Allowance", the contract price shall be adjusted accordingly. The adjustment in contract price shall be made on the basis of the purchase price without additional charges for overhead, profit, insurance or any other incidental expenses. The cost of installation of the "Allowable Materials" shall be included in the applicable sections of the contract specifications covering this work.

37. USE OF PREMISES AND REMOVAL OF DEBRIS. The Contractor expressly undertakes at his own expense:

    (a) To take every precaution against injuries to persons or damage to property.

    (b) To store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or the work of any other contractors.

    (c) To place upon the work or any part thereof only such loads as are consistent with the safety of that portion of the work.

    (d) To clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the work shall present a neat, orderly and workmanlike appearance.

    (e) Before final payment to remove all surplus material, false work, temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from his operations, and to put the site in a neat, orderly condition.

    (f) To effect all cutting, fitting or patching of his work required to make the same conform to the plans and specifications, and, except with the consent of the Engineer, not to cut or otherwise alter the work of any other contractor.

38. QUANTITIES OF ESTIMATE. The estimated quantities of work to be done and materials to be furnished under this contract, shown in any of the documents, including the proposal, are given for use in comparing bids, and the right is especially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this contract, and such increase or diminution shall in no way vitiate this contract, nor shall any such increase or diminution give cause for claims or liability for damages.

39. RIGHT-OF-WAY AND SUSPENSION OF WORK. The Owner shall furnish all land and rights-of-way necessary for the carrying out of this contract and the completion of the work herein contemplated, and will use due diligence in acquiring said land and rights-of-way as speedily as possible. But it is possible that all lands and rights-of-way may not be obtained as herein contemplated before construction begins, in which event the Contractor shall begin his work upon such land and rights-of-way as the Owner may have previously acquired, and no claim for damages whatsoever will be allowed by reason of the delay in obtaining the remaining lands and rights-of-way.

    Should the Owner be prevented or enjoined from proceeding with the work, or from authorizing its prosecution, either before or after the commencement, by reason of any litigation or by reason of its ability to procure any lands or rights-of-way for said work, the Contractor shall not be entitled to make or assert claim for damage by reason of said delay or to withdraw from the contract except by consent of the Owner; but time for completion of

the work will be extended to such time as the Owner determines will compensate for the time lost by such delay, such determination to be set forth in writing.

40. GENERAL WARRANTY FOR ONE YEAR AFTER COMPLETION OF CONTRACT. For a period of at least one year after the completion of the contract, the Contractor warrants the fitness and soundness of all work done and materials and equipment put in place under the contract, and neither the final certificate of payment nor any provision in the Contract Documents nor partial or entire occupancy of the premises by the Owner shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting there from, which shall appear within a period of one year from the date of final acceptance of the work, unless a longer period is specified. The Owner will give notice of observed defects with reasonable promptness.

41. NOTICE AND SERVICE THEREOF. Any notice to any Contractor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted by registered mail to said Contractor or his authorized representative on the work, or is deposited in the regular United States Mail in a sealed, postage prepaid envelope and the receipt thereof is acknowledged by the Contractor.

41.1 Owner's Notice. All papers required to be delivered to the Owner shall be delivered as indicated in Section 00800 entitled Supplemental General Conditions.

42. REQUIRED PROVISIONS DEEMED INSERTED. Each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein, and the contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted or is not correctly inserted, then upon the application of either party the contract shall forthwith by physically amended to make such insertion or correction.

43. PROTECTION OF LIVES AND HEALTH. In order to protect the lives and health of his employees under the contract, the Contractor shall comply with all pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under the contract. The Contractor alone shall be responsible for the safety, efficiency and adequacy of his plant, appliances and methods, and for any damage that may result from their failure or their improper construction, maintenance or operation.

44. WAGES AND OVERTIME COMPENSATION. The Contractor and each of his subcontractors shall comply with all applicable State and local laws or ordinances with respect to the hours worked by laborers and mechanics engaged in work on the project and with respect to compensation for overtime.

45. PROHIBITED INTERESTS. No official of the Owner, who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection, construction, or material supply contract or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part hereof. No officer, employee, architect, attorney, engineer, or inspector of and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project shall become directly or indirectly interested personally in this contract or in any part hereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

46. CONFLICTING CONDITIONS. Any provisions in any of the Contract Documents which may be in conflict or inconsistent with any of the paragraphs in these General Conditions shall be void to the extent of such conflict or inconsistency.

47. INDEMNIFICATION

47.1 The CONTRACTOR will indemnify and hold harmless the OWNER, the ENGINEER 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, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting there from; and is caused in whole or in part by any negligent or willful act of omission of the CONTRACTOR and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

47.2 In any and all claims against the OWNER or the ENGINEER, or any of their agents or employees, by an employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly 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 by limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or other employee benefits acts.

47.3 The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER, its agents or employees arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, design or specifications.

END OF SECTION

SECTION 00800

SUPPLEMENTAL GENERAL CONDITIONS

A. ENUMERATION OF PLANS, SPECIFICATIONS AND ADDENDA

1. The plans, specifications and addenda which form a part of this contract as set forth in Paragraph 1 of the General Conditions, Contract and Contract Documents are enumerated in Section 00005 - Table of Contents and Section 00851 - Drawings Index.

B. CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE

1. As required under Paragraph 29 of the General Conditions, the CONTRACTOR shall not commence WORK under this Contract until he has obtained all the insurance required under this paragraph and such insurance has been approved by the OWNER, nor shall the CONTRACTOR allow any SUBCONTRACTOR to commence WORK on his Subcontract until all similar insurance required of the SUBCONTRACTOR has been so obtained and approved.

2. Unless otherwise specified in this Contract, the CONTRACTOR shall, at its sole expense, maintain in effect at all times, during the performance of WORK, insurance coverage with limits not less than those set forth below with insurers and under forms of policies satisfactory to OWNER.

3. The CONTRACTOR shall deliver Certificates of Insurance to the ENGINEER no later than ten (10) days after award of the Contract but in any event, prior to execution of the Contract by the OWNER and prior to commencing WORK on the site as evidence that policies providing such coverage and limits of insurance are in full force and effect.

   a. Certificates shall provide that not less than thirty (30) days advance notice will be given in writing to the OWNER prior to cancellation, termination or material alteration of said policies of insurance.

   b. Certificates shall identify on their faces the PROJECT NAME and the ENGINEER'S PROJECT NUMBER.

4. Additional Insured: The Commercial General Liability, Excess Liability (Umbrella) and Comprehensive Automobile Liability insurance policies shall be endorsed to include the OWNER and ENGINEER as additional insured for ongoing and completed operations. Such insurance shall be primary and not be contributory with any other insurance maintained by the OWNER or ENGINEER.

5. The OWNER AND ENGINEER are not maintaining any insurance on behalf of the CONTRACTOR covering against loss or damage to the WORK or to any other property of the CONTRACTOR unless otherwise specifically stated herein and as may be described by appendix hereto. In the event the CONTRACTOR maintains insurance against physical loss or damage to the CONTRACTOR'S construction equipment and tools, such insurance shall include an insurer's waiver of rights of subrogation in favor of OWNER AND THE ENGINEER.

6. Provide only insurance carrier(s) with an “A” rating.

7. The CONTRACTOR shall indemnify the OWNER and the ENGINEER as stated in Part 47 of Section 00700.

8. **Insurance Requirements:**

a. **Commercial General Liability Insurance:** The CONTRACTOR shall take out and maintain during the life of the Contract such commercial general liability insurance as shall protect him from claims for damage for bodily injury, including accidental death, as well as from claims for property damage, which may arise from operations under this contract whether such operations are by himself or by any SUBCONTRACTOR or by anyone directly or indirectly employed by either of them. The amount of such insurance shall be not less than the following:

General Aggregate	$2,000,000.00
Products - Complete/Operations Aggregate	$2,000,000.00
Personal and Advertising Injury	$1,000,000.00
Each Occurrence	$1,000,000.00
Fire Damage (Any one fire)	$50,000.00
Medical Expenses (Any one person)	$5,000.00

1) The General Aggregate listed above shall be for this project only.

2) **Special Hazards:** The CONTRACTOR'S and his SUB-CONTRACTOR'S General Liability Insurance shall provide adequate protection against use of explosives, collapse, and underground hazards. Each detonation of blasting shall be considered a single occurrence.

3) Provide Waiver of Subrogation in favor of the Owner and AECOM Technical Services, Inc.

b. **Comprehensive Automobile Liability Insurance:**

1) Includes coverage for all owned, hired and non-owned automobiles.

2) The combined single limit of liability shall not be less than the following:

Any One Accident or Loss	$1,000,000.00

3) Provide Waiver of Subrogation in favor of the Owner and AECOM Technical Services, Inc.

c. **Excess Liability (Umbrella) Insurance:**

1) CONTRACTOR shall carry and maintain Combined Excess Liability (Umbrella) insurance for a limit not less than the following:

Each Occurrence	$5,000,000.00
Aggregate	$5,000,000.00

d. **Worker's Compensation:** The insurance required by this Section shall be written for not less than the following or greater if required by law:

1) Statutory benefits as provided by South Carolina Law.

2) Employers' Liability:

Each Accident	$500,000.00
Disease - Policy Limit	$500,000.00
Disease - Each Employee	$500,000.00

3) Provide Waiver of Subrogation in favor of the Owner and AECOM Technical Services, Inc.

e. **Builders Risk Insurance and Installation Floater Policy:** Where buildings and applicable above-ground structures are included in the Project, CONTRACTOR shall purchase and maintain an "all risk" or special perils form builder's risk policy. Where utilities and underground structures are included in the Project, CONTRACTOR shall purchase and maintain an Installation Floater Policy. Policy shall be issued in the name of the CONTRACTOR, OWNER and all SUBCONTRACTORS for the full contract value of the insurable portions of the WORK. This policy shall contain a provision that in the event of payment of any loss or damage, the insurer will have no rights of recovery against any of the parties named as insureds or additional insureds.

f. **Flood Insurance:** The CONTRACTOR is required to carry flood insurance for projects located in designated flood hazard areas in which Federal Flood Insurance is available.

g. **Earthquake Insurance**: The CONTRACTOR is required to carry earthquake insurance for the full contract value of insurable portions of the WORK.

h. **OWNER'S Protective Liability Insurance:** The CONTRACTOR shall purchase and maintain an OWNER'S Protective Liability policy issued in the name of the OWNER with a combined single limit of liability of not less than the following:

Each Occurrence	$2,000,000.00
Aggregate	$2,000,000.00

C. ABBREVIATIONS AND DEFINITIONS

1. Abbreviations used in these Specifications refer to the following:

OWNER:

ENGINEER: AECOM Technical Services, Inc. or their duly authorized representative

2. Definitions: Wherever in the specifications or upon the drawings the words "directed", "required", "permitted", "ordered", "designated", "prescribed", or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation or prescription of the OWNER is intended; and similarly, the words "approved", "acceptable", "satisfactory", or words of like import shall mean approved by, or acceptable to, or satisfactory to the OWNER, unless otherwise expressly stated.

D. PHOTOGRAPHS OF PROJECT

1. No photographs of the project will be required.

E. SCHEDULE OF OCCUPATIONAL CLASSIFICATIONS AND MINIMUM HOURLY WAGE RATES

1. Not applicable.

F. NOTICE AND SERVICE THEREOF

1. All papers required to be delivered to the OWNER shall, unless otherwise specified in writing to the CONTRACTOR, be delivered to the OWNER'S representative as indicated below, and any notice to or demand upon the OWNER shall be sufficiently given if delivered to the office of said representative, or if deposited in the United States Mail, in a sealed postage prepaid envelope, or delivered with charges prepaid to any telegraph company for transmission, in each case addressed to the OWNER'S representative as indicated below, or to such other representative of the OWNER, or to such other address as the OWNER may subsequently specify in writing to the CONTRACTOR for such purposes. The OWNER'S representative is as follows:

AECOM
2151 Pickens Street, Suite 301
Columbia SC, 29201

G. CORRELATION OF PLANS AND SPECIFICATIONS

1. The contract, plans and specifications are to be interpreted as mutually explanatory or supplementary, and therefore any features shown in one and not in the other shall have the same force and effect as if shown by both, and shall be fully executed. Prior to execution of the WORK, the CONTRACTOR shall check all drawings and specifications, and shall immediately report to the ENGINEER all errors, discrepancies, conflicts and omissions discovered therein. All such errors, discrepancies, conflicts and omissions will be adjusted by the ENGINEER, and adjustment by the CONTRACTOR without prior approval shall be at his own risk. The settlement of any complications arising from such adjustments shall be made by the CONTRACTOR at his own expense and to the satisfaction of the OWNER.

H. OWNERSHIP OF DRAWINGS

1. All drawings, specifications and memoranda relating to the WORK are the property of the OWNER and are to be carefully used and returned to the OWNER upon completion or cessation of the WORK from any cause.

2. Plans and specifications to be furnished: Five (5) sets of specifications and plans will be furnished to the CONTRACTOR without charge. Additional sets can be secured from the ENGINEER upon request at cost of reproduction. The CONTRACTOR shall have available on the project site at all times one (1) copy of each of said plans and specifications.

I. ORDER OF WORK

1. The prosecution, order or sequence of the WORK shall be as approved by the ENGINEER, which approval, however, shall in no way affect the responsibility of the CONTRACTOR.

J. PHYSICAL DATA

1. The drawings, which accompany and form a part of the contract, have been prepared on the basis of surveys and observations of the site, and are intended to present an essentially accurate indication of the physical conditions at the site. However, this shall not relieve the CONTRACTOR of the necessity for familiarizing himself with physical conditions at the site, and any discrepancies found in the drawings shall not be grounds for claims by the CONTRACTOR against the

OWNER, or for non-performance of WORK specifically provided for under the contract.

K. CONSTRUCTION RESOURCES AND PROGRESS

1. The following is supplemental to Paragraph 16 of the General Conditions:

   a. The CONTRACTOR shall give his personal superintendence to the WORK, or shall have a competent superintendent with authority to act for him, to the satisfaction of the ENGINEER, on the job at all times during the progress of the WORK.

   b. The CONTRACTOR shall employ experienced personnel and provide all necessary construction resources including tools, supplies and equipment sufficient to accomplish the WORK in a safe and workmanlike manner at a rate of progress satisfactory to the OWNER. All equipment shall be maintained in good working order and provision shall be made for immediate emergency repairs. Spares tools and equipment shall be maintained on the job site so that a failure of such does not compromise the progress of the work.

   c. Should the CONTRACTOR fail to maintain a rate of progress which, in the opinion of the OWNER, will complete WORK within the time limit specified, the OWNER may require that additional persons working, if necessary, during additional periods or shifts, or additional equipment, or both, be placed on the WORK; or a reorganization of construction resources be implemented in order that the progress of the WORK be brought up to schedule and so maintained. Should the CONTRACTOR refuse or neglect to increase personnel, extend the working period or provide adequate construction resources, or to reorganize or reallocate personnel and resources in the manner satisfactory to the OWNER, the latter may proceed under the provisions of the Contract to rectify the conditions.

L. ENGINEER'S REVIEW AND CONTRACTOR'S INSPECTION

1. The WORK shall be periodically reviewed by the ENGINEER's representatives, but the presence of the ENGINEER's representatives shall not relieve the CONTRACTOR or his responsible agent of responsibility for the proper execution of the WORK.

2. The CONTRACTOR will be required to furnish at his expense such labor, organization and materials which form a part of the ordinary and usual equipment and crew of the CONTRACTOR as may be reasonably necessary in inspecting and supervising the WORK. Should the CONTRACTOR refuse, neglect or delay compliance with this requirement, the specified facilities may be furnished and maintained by the OWNER and the cost thereof will be deducted from any amounts due, or to become due, the CONTRACTOR.

3. Except as specified in this paragraph, or otherwise provided for in these specifications, all expense of inspection will be borne by the CONTRACTOR.

4. It is understood that any instruction or decision given by the ENGINEER through the Resident ENGINEER is to be considered the instruction or decision of the OWNER, in all cases where, under the terms of this contract, decision rests with the ENGINEER.

5. The ENGINEER or his authorized representative shall have access to the WORK at all times.

M. STANDARD TESTS, QUALITY AND GUARANTEES

1. Standard tests, quality and guarantees shall comply with the following:

   a. All materials, supplies and parts and assemblies thereof, entering into the WORK to be performed under these specifications, shall be tested as specified herein or otherwise required, in conformity with the contract and according to the best modern approved methods for the particular type and class of WORK.

   b. Unless waived in writing by the ENGINEER, all tests and trials shall be made in the presence of a duly authorized representative of the ENGINEER. When the presence of the inspector is so waived, sworn statements in duplicate of the tests made and results thereof shall be furnished to the ENGINEER by the CONTRACTOR as soon as possible after completion of tests.

   c. Unless otherwise authorized, directed or specified, where standard published specifications of recognized authorities and organizations are mentioned, the latest revision of such specification current at the time when the WORK is executed shall govern.

   d. All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the OWNER. The OWNER will pay for all laboratory inspection service direct and not as a part of the contract.

   e. Materials of construction, particularly those upon which the strength and durability of the structure may depend, shall be subject to inspection and testing to establish conformance with specifications and suitability for uses intended.

   f. In accordance with the Contract, all materials, parts and equipment furnished and incorporated in the WORK shall be high grade, free from defects and imperfections, of recent manufacture and unused. Workmanship shall be of the highest grade and in accordance with the best modern standard practice.

N. STANDARD PRODUCTS

1. All materials supplied and articles furnished shall, wherever specified and otherwise wherever practicable, be the standard products of recognized, reputable manufacturers. The standard products of manufacturers other than those specified will be accepted when it is proven to the satisfaction of the ENGINEER, in accordance with the Contract, that they are equal in strength, durability, usefulness and convenience for the purpose intended. Any changes required in the details and dimensions indicated on the drawings, or the substitution of standard products other than those provided for, shall be properly made as approved by the ENGINEER and at the expense of the CONTRACTOR.

END OF SECTION

SECTION 00851

DRAWINGS INDEX

TITLE	SHEET NO.
Cover Sheet & Location Map	C1
General Notes & Legend	C1.1
Existing Conditions	C2
Overall Stormwater Improvement Plan	C3.1
Pipe Tables	C3.2
Structure Tables	C3.3
D'Ancona Dr. Trunkline Plan & Profile	C4
D'Ancona Dr. & Bagnal St. Trunkline Plan & Profile	C5
Commerce St. Trunkline Plan & Profiles	C6
Loring Dr. (West) Trunkline Plan & Profiles	C7
Loring Dr. (East) Trunkline Plan & Profiles	C8
SCDOT Standard Notes	C9
Stormwater Details	C10
Stormwater Details	C11
Stormwater Details	C12
Miscellaneous Details	C13
Sediment & Erosion Control Details	C14

SECTION 01050.1

FIELD ENGINEERING

PART 1 GENERAL

1.1 DESCRIPTION

A. Work included: Provide such field engineering services as are required for proper completion of the Work including, but not necessarily limited to:

1. Provide all staking required to construct the facility from base lines established by the Engineer.
2. Establish proper line and levels for installation of utilities.
3. Provide surveying for record drawings.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Additional requirements for field engineering also may be described in other Sections of these Specifications.
3. Section 01720 – Project Record Drawings.
4. Section 02220 - Excavation, Backfilling for Utilities.
5. Section 02721 - Sewers: Storm Drainage.

C. Work by others: Not less than two benchmark elevations will be provided.

1.2 QUALITY ASSURANCE

A. Provide a competent survey party and surveying instruments for staking the work.

B. Exercise proper precautions to verify the figures shown on the Drawings prior to laying out any part of the Work.

1. The Contractor will be held responsible for any errors therein that otherwise might have been avoided.
2. Promptly inform the Engineer of any error or discrepancies discovered in the Drawings or Specifications in order that proper corrections may be made.

1.3 PROCEDURES

A. Locate and protect control points before starting work on the site.

B. Preserve permanent reference points during progress of the Work.

C. Do not change or relocate reference points or items of the Work without specific approval from the Engineer.

D. Promptly advise the Engineer when a reference point is lost or destroyed, or requires relocation because of other changes in the Work.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION (NOT APPLICABLE)

END OF SECTION

SECTION 01060

REGULATORY REQUIREMENTS

A. The following requirements of Regulatory Agencies having an interest in this project are hereby made a part of this Contract.

B. The construction of the project, including the letting of contracts in connection therewith, shall conform to the applicable requirements of State, territorial, and local laws and ordinances to the extent that such requirements do not conflict with Federal laws and this subchapter.

C. South Carolina Sales Tax: All applicable South Carolina sales tax shall be to the account of the Contractor.

D. Use of chemicals: All chemicals used during the project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or of other classification, must show approval of EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with instructions.

E. Safety and Health Regulations: The Contractor shall comply with the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54).

F. The Contractor shall comply with Part V of the South Carolina Manual on Uniform Traffic Control Devices for Streets and Highways.

G. Inspection by Agencies: The representatives of the South Carolina Department of Health and Environmental Control, USDA Rural Development, Environmental Protection Agency, and the Corps of Engineers shall have access to the work wherever it is, in preparation or in progress, and the Contractor shall provide proper facilities for such access and inspection.

H. Withholding for non-residents shall comply with the following:

1. Attention of non-resident Contractors is invited to Code Sections 12-8-540 and 12-8-550 as amended effective July 1, 1994, Section 49, Appropriations Bill, Part II.
2. If a non-resident Contractor is the successful bidder on this project, he shall be required to provide the Owner with an Affidavit (Form I-312, Nonresident Taxpayer Registration Affidavit Income Tax Withholding) affirming registration with the South Carolina Department of Revenue or the South Carolina Secretary of State's office. (See attached form).
3. Forms to register for all taxes administered by the South Carolina Department of Revenue may be obtained by calling the License and Registration Section at (803) 737-4872 or writing to South Carolina Department of Revenue, Registration Unit, Columbia, South Carolina 29214-0140.
4. In the absence of an Affidavit being provided, withholding in the amount of two (2) percent of the contract price will be made by the Owner.

I. Bypassing of wastewater: No wastewater bypassing will be permitted during construction unless a schedule has been approved by the South Carolina Department of Health and Environmental Control, if required pursuant to the terms of the NPDES permit.

1. Schedule work to minimize bypassing.

2. Coordinate all work which will affect operation of the existing treatment facility with the Owner and the Engineer to assure the least interruption possible in operation of the existing facilities.
3. Make no connections to the existing treatment facility diverting flow to the new facility until directed by the Engineer.

END OF SECTION

Attachment

1350

STATE OF SOUTH CAROLINA
DEPARTMENT OF REVENUE

NONRESIDENT TAXPAYER REGISTRATION AFFIDAVIT INCOME TAX WITHHOLDING

I-312
(Rev. 10/5/07)
3323

Mail to: The company or individual you are contracting with.

The undersigned nonresident taxpayer on oath, being first duly sworn, hereby certifies as follows:

1. Name of Nonresident Taxpayer: _____

2. Trade Name, if applicable (Doing Business As):

_____

3. Mailing Address: _____

4. Federal Employer Identification Number (FEI): _____

5. _____ Hiring or Contracting with:
Name: _____

Address: _____

_____ Receiving Rentals or Royalties From:
Name: _____

Address: _____

_____ Beneficiary of Trusts and Estates:
Name: _____

Address: _____

6. I hereby certify that the above named nonresident taxpayer is currently registered with (check the appropriate box):
   - ☐ The South Carolina Secretary of State or
   - ☐ The South Carolina Department of Revenue

   Date of Registration: _____

7. I understand that by this registration, the above named nonresident taxpayer has agreed to be subject to the jurisdiction of the South Carolina Department of Revenue and the courts of South Carolina to determine its South Carolina tax liability, including estimated taxes, together with any related interest and penalties.

8. I understand the South Carolina Department of Revenue may revoke the withholding exemption granted under Code Sections 12-8-540 (rentals), 12-8-550 (temporarily doing business or professional services in South Carolina), and 12-8-570 (distributions to nonresident beneficiary by trusts or estates) at any time it determines that the above named nonresident taxpayer is not cooperating with the Department in the determination of its correct South Carolina tax liability.

The undersigned understands that any false statement contained herein could be punished by fine, imprisonment or both.

Recognizing that I am subject to the criminal penalties under Code Section 12-54-44 (B) (6) (a) (i), I declare that I have examined this affidavit and to the best of my knowledge and belief, it is true, correct and complete.

_____ (Seal) _____
Signature of Nonresident Taxpayer (Owner, Partner or Corporate Officer, when relevant) Date

If Corporate officer, state title: _____

_____
(Name - Please Print)

33231028

INFORMATION
NONRESIDENT TAXPAYER REGISTRATION AFFIDAVIT

Submit this form to the company or individual you are contracting with.

Do not submit this form to South Carolina Department of Revenue.

PURPOSE OF AFFIDAVIT
A person is not required to withhold taxes for a nonresident taxpayer who submits an affidavit certifying that they are registered with either the South Carolina Secretary of State or the South Carolina Department of Revenue.

REQUIREMENTS TO MAKE WITHHOLDING PAYMENTS
Code Section 12-8-550 requires persons hiring or contracting with a nonresident taxpayer to withhold 2% of each payment made to the nonresident where the payments under the contract exceed $10,000. However, this section does not apply to payments on purchase orders for tangible personal property when those payments are not accompanied by services to be performed in this state.

Code Section 12-8-540 requires persons making payment to a nonresident taxpayer of rentals or royalties at a rate of $1,200 or more a year for the use of or for the privilege of using property in South Carolina to withhold 7% of the total of each payment made to a nonresident taxpayer who is not a corporation and 5% if the payment is made to a corporation.

Code Section 12-8-570 requires trusts or estates making distribution of South Carolina taxable income to a nonresident beneficiary to withhold 7% of the beneficiary's distribution which is attributable to South Carolina taxable income.

Our Internet address is: **www.sctax.org**

SECTION 01061

PERMITS AND RIGHTS-OF-WAY

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: This section establishes requirements pertaining to the securement and payment for licenses, building permits, rights-of-way, etc., necessary for the construction of the project.

B. Work not included: The Owner will obtain and provide to the Contractor, as required, copies of:

1. Encroachment permits, South Carolina Department of Transportation.
2. Easements obtained to cross private property.
3. South Carolina Department of Health and Environmental Control, Permit to Construct.

C. Related work: Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications.

1.2 SUBMITTALS

A. Submit to the Engineer satisfactory evidence that all necessary licenses, building permits, etc., have been secured prior to commencing the work.

PART 2 - PRODUCTS

No products are required for this work.

PART 3 - EXECUTION

3.1 BUSINESS LICENSE

A. Determine licenses necessary to perform the work at project location.

B. Obtain all necessary licenses at no additional cost to the Owner.

3.2 RIGHTS-OF-WAY, UTILITY LINES

A. Owner will provide necessary rights-of-way or easements for construction of utility lines, whether on privately or publicly owned property.

B. The Contractor shall confine his activities to the approved easement provided.

C. The Owner will provide no right-of-way over other property.

END OF SECTION

SECTION 01090

REFERENCE STANDARDS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Throughout the Project Documents, reference is made to specifications and standards issued by nationally recognized professional and/or trade organizations.

1. These referenced standards are generally identified by abbreviating the name of the organization following with the specification/standard number.
2. Unless specifically indicated otherwise, all references to standards refer to the latest edition available at the time of the bidding.

1.2 ABBREVIATIONS

A. Wherever the following abbreviations are used in these Project Documents, they are to be construed the same as the respective expressions represented:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ALS	American Lumber Standards
ANSI	American National Standards Institute, Inc.
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
AWPA	American Wood Preservers Association
AWS	American Welding Society
FSS	Federal Specifications and Standards, General Services Administration
IBC	International Building Code
NACE	National Association of Corrosion Engineers
NFPA	National Fire Protection Association
NSF	Formerly: National Sanitary Foundation
OSHA	Occupational Safety and Health Administration
SPIB	Southern Pine Inspection Bureau
SSPC	Steel Structures Painting Council

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION (NOT APPLICABLE)

END OF SECTION

SECTION 01200

CONTRACTOR/SUBCONTRACTOR QUALIFICATIONS

PART 1 - GENERAL

The following information and completed forms may be requested by the Owner of the three lowest bidders. The request will be made within five (5) days following the bid opening. Requested data to be received by the Owner within ten (10) days of the request. Failure to provide the data in this section, upon request, will subject bidder to disqualification.

1.1 DESCRIPTION

A. Information submitted will be used by the Owner to determine the competency and ability of the Contractor/Subcontractor to perform the scheduled work in a manner deemed satisfactory to the Owner. The Owner's decision shall be final.

B. Any Subcontractor used by the General Contractor whose portion of this project exceeds 5% of the total bid price shall be required to provide the same information as the General Contractor.

C. The Contractor/Subcontractor shall include with this section a detailed financial statement indicating the Contractor's/ Subcontractor's financial resources. The information on that statement shall be certified by a Certified Public Accountant and shall be submitted on the Associated General Contractor's of America form "Standard Questionnaires and Financial Statement for Bidders".

D. The Contractor/Subcontractor shall certify by attaching his signature to this Section as provided that all information contained herein is complete and all statements and answers are accurate and true. Providing misinformation, incomplete information, inaccurate information, or failure to certify the information, will subject bidder to disqualification.

1.2 QUALIFICATIONS

A. Complete the following (attach additional sheets as required):

Name: _____

Address: _____

City, State, Zip: _____

Principal: _____

B. Number of years your firm has been in business: _____

C. List and describe a minimum of five (5) previous projects of similar size and nature completed in the last ten (10) years. (Attach additional sheets, if necessary):

1. _____

_____

_____

2. _____

3. _____

4. _____

5. _____

D. List Owner, contact and telephone number for each of the five (5) projects referenced above. (Attach additional sheets, if necessary):

1. _____

2. _____

3. _____

4. _____

5. _____

_____

_____

E. For the projects listed in Item C, list the original bid price, final construction costs, specified completion time, actual completion time and explanations for differences in costs and times as required. (Attach additional sheets, if necessary):

1. Original contract price: _____

   Final construction price: _____

   Specified completion time: _____

   Actual completion time: _____

   Explanation: _____

_____

_____

_____

_____

2. Original contract price: _____

   Final construction price: _____

   Specified completion time: _____

   Actual completion time: _____

   Explanation: _____

_____

_____

_____

3. Original contract price: _____

   Final construction price: _____

   Specified completion time: _____

   Actual completion time: _____

   Explanation: _____

_____

4. Original contract price: _____

Final construction price: _____

Specified completion time: _____

Actual completion time: _____

Explanation: _____

5. Original contract price: _____

Final construction price: _____

Specified completion time: _____

Actual completion time: _____

Explanation: _____

F. List the names, addresses and work of any portion of this project which will be subcontracted (more than 1% of the bid price). (Attach additional sheets, if necessary):

1.

2.

3.

4.

5.

G. List equipment owned that is available for this project:

H. List equipment to be purchased, leased or rented to perform this work:

I. List superintendent(s), foremen or others in charge who will be assigned to this project. Provide resumes and qualifications (insert sheets as required):

J. List and describe current projects, current status of job and estimated schedule of completion. (Attach additional sheets, if necessary):

1.

2.

3.

4.

5. _____

_____

_____

_____

_____

K. List past projects completed with Owner of project proposed in last fifteen (15) years. (Attach additional sheets, if necessary):

1. _____

_____

_____

2. _____

_____

_____

3. _____

_____

_____

4. _____

_____

_____

5. _____

_____

_____

L. List past projects bid on with Owner of project proposed in last fifteen (15) years. (Attach additional sheets, if necessary):

1. _____

_____

_____

2. _____

3. _____

4. _____

5. _____

M. List all past projects completed with Engineer in past fifteen (15) years (use additional sheets, if necessary):

1. Project Name: _____
   Project Manager: (Engineer's) _____
   Original Contract Price: _____
   Final Construction Price: _____
   Specified Completion Time: _____
   Actual Completion Time: _____
   Explanation: _____

2. Project Name: _____
   Project Manager: (Engineer's) _____
   Original Contract Price: _____
   Final Construction Price: _____
   Specified Completion Time: _____

Actual Completion Time: _____

Explanation: _____

_____

_____

_____

3. Project Name: _____

Project Manager: (Engineer's) _____

Original Contract Price: _____

Final Construction Price: _____

Specified Completion Time: _____

Actual Completion Time: _____

Explanation: _____

_____

_____

_____

4. Project Name: _____

Project Manager: (Engineer's) _____

Original Contract Price: _____

Final Construction Price: _____

Specified Completion Time: _____

Actual Completion Time: _____

Explanation: _____

_____

_____

_____

5. Project Name: _____

Project Manager: (Engineer's) _____

Original Contract Price: _____

Final Construction Price: _____

Specified Completion Time: _____

Actual Completion Time: _____

Explanation: _____

_____

_____

_____

6. Project Name: _____

Project Manager: (Engineer's) _____

Original Contract Price: _____

Final Construction Price: _____

Specified Completion Time: _____

Actual Completion Time: _____

Explanation: _____

_____

_____

_____

7. Project Name: _____

Project Manager: (Engineer's) _____

Original Contract Price: _____

Final Construction Price: _____

Specified Completion Time: _____

Actual Completion Time: _____

Explanation: _____

_____

_____

8. Project Name: _____

Project Manager: (Engineer's) _____

Original Contract Price: _____

Final Construction Price: _____

Specified Completion Time: _____

Actual Completion Time: _____

Explanation: _____

_____

_____

_____

9. Project Name: _____

Project Manager: (Engineer's) _____

Original Contract Price: _____

Final Construction Price: _____

Specified Completion Time: _____

Actual Completion Time: _____

Explanation: _____

_____

_____

_____

10. Project Name: _____

Project Manager: (Engineer's) _____

Original Contract Price: _____

Final Construction Price: _____

Specified Completion Time: _____

Actual Completion Time: _____

Explanation: _____

_____

_____

_____

11. Project Name: _____

Project Manager: (Engineer's) _____

Original Contract Price: _____

Final Construction Price: _____

Specified Completion Time: _____

Actual Completion Time: _____

Explanation: _____

_____

_____

_____

12. Project Name: _____

Project Manager: (Engineer's) _____

Original Contract Price: _____

Final Construction Price: _____

Specified Completion Time: _____

Actual Completion Time: _____

Explanation: _____

_____

_____

_____

13. Project Name: _____

Project Manager: (Engineer's) _____

Original Contract Price: _____

Final Construction Price: _____

Specified Completion Time: _____

Actual Completion Time: _____

Explanation: _____

_____

_____

14. Project Name: _____

Project Manager: (Engineer's) _____

Original Contract Price: _____

Final Construction Price: _____

Specified Completion Time: _____

Actual Completion Time: _____

Explanation: _____

_____

_____

_____

15. Project Name: _____

Project Manager: (Engineer's) _____

Original Contract Price: _____

Final Construction Price: _____

Specified Completion Time: _____

Actual Completion Time: _____

Explanation: _____

_____

_____

_____

N. List all projects involving litigation, arbitration and/or mediation in past twenty (20) years (Attach additional sheets, if necessary):

1. Project Name: _____

Owner: _____

Engineer: _____

Date: _____

Explanation: _____

_____

_____

_____

_____

_____

Result: _____

2. Project Name:
   Owner:
   Engineer:
   Date:
   Explanation:

   Result:

3. Project Name:
   Owner:
   Engineer:
   Date:
   Explanation:

   Result:

4. Project Name:

Owner: _____

Engineer: _____

Date: _____

Explanation: _____

_____

_____

_____

_____

_____

Result: _____

_____

_____

5. Project Name: _____

Owner: _____

Engineer: _____

Date: _____

Explanation: _____

_____

_____

_____

_____

_____

Result: _____

_____

_____

O. Attach rate schedule for equipment, labor, overhead and profit.

☐ Rate schedule attached.

P. Additional information:

I HEREBY CERTIFY that as a duly authorized representative of _____ _____ (bidder), the information provided is to the best of my knowledge accurate and that failure to provide accurate information will result in disqualification of my bid.

_____
Signature

_____
Name (Please Print)

(SEAL)

_____
Title

_____
Date

_____
Notary Public for South Carolina

My Commission Expires: _____

END OF SECTION

SECTION 01210

PRECONSTRUCTION CONFERENCE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: To help clarify construction contract administration procedures, the Engineer will conduct a Preconstruction Conference prior to start of the Work. Provide attendance by the designated personnel.

B. Related work: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. For those persons designated by the Contractor, his subcontractors, and suppliers to attend the Preconstruction Conference, provide required authority to commit the entities they represent to solutions agreed upon in the Conference.

1.3 SUBMITTALS

A. To the maximum extent practicable, advise the Engineer at least 24 hours in advance of the Conference as to items to be added to the agenda.

B. The Engineer will compile minutes of the Conference, and will furnish three copies of the minutes to the Contractor and required copies to the Owner. The Contractor may make and distribute such other copies as he wishes.

1.4 PRECONSTRUCTION CONFERENCE

A. The Conference will be scheduled to be held within 30 working days after the Owner has determined the low bidder and may be held prior to issuance of the Notice to Proceed when required by regulatory agencies having jurisdiction. In any event, the Conference will be held prior to actual start of the work.

B. Attendance:

1. Provide attendance by authorized representatives of the Contractor and major subcontractors.
2. The Engineer will advise other interested parties, including the Owner, and request their attendance.

C. Minimum agenda: Data will be distributed and discussed on:

1. Organizational arrangement of Contractor's forces and personnel and those of subcontractors, materials suppliers, and the Engineer.
2. Channels and procedures for communication.
3. Construction schedule, including sequence of critical work.
4. Contract Documents, including distribution of required copies of Drawings and revisions.
5. Processing of Shop Drawings and other data submitted to the Engineer for review.
6. Processing of field decisions and Change Orders.
7. Rules and regulations governing performance of the Work.

8. Procedures for security, quality control, housekeeping, and related matters.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION (NOT APPLICABLE)

END OF SECTION

SECTION 01220

PROJECT MEETINGS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: To enable orderly review during progress of the Project, and to provide for systematic discussion of problems, the Engineer will conduct project meetings throughout the construction period.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. The Contractor's relations with his subcontractors and materials suppliers, and discussions relative thereto, are the Contractor's responsibility and normally are not part of project meetings content.

1.2 QUALITY ASSURANCE

A. For those persons designated by the Contractor to attend and participate in project meetings, provide required authority to commit the Contractor to solutions agreed upon in the project meetings.

1.3 SUBMITTALS

A. Agenda items: To the maximum extent practicable, advise the Engineer at least 48 hours in advance of project meetings regarding items to be added to the agenda.

B. Minutes:

1. The Engineer will compile Minutes of each project meeting, and will furnish three copies to the Contractor and required copies to Owner.
2. Recipients of copies may make and distribute such other copies as they wish.

PART 2 - PRODUCTS

(No products are required in this Section)

PART 3 - EXECUTION

3.1 MEETING SCHEDULE

A. Project meetings will be held on an as-needed basis.

B. Coordinate as necessary to establish mutually acceptable schedule for meetings.

3.2 MEETING LOCATION

A. The Engineer will establish meeting location. To the maximum extent practicable, meetings will be held at the project site.

3.3 PROJECT MEETINGS

A. Attendance:

1. To the maximum extent practicable, assign the same person or persons to represent the Contractor at project meetings throughout progress of the Work.
2. Subcontractors, materials suppliers, and others may be invited to attend those project meetings in which their aspect of the Work is involved.

B. Minimum agenda:

1. Review, revise as necessary, and approve Minutes of previous meetings.
2. Review progress of the Work since last meeting, including status of submittals for approval.
3. Identify problems that impede planned progress.
4. Develop corrective measures and procedures to regain planned schedule.
5. Complete other current business.

C. Revisions to Minutes:

1. Unless published Minutes are challenged in writing prior to the next regularly scheduled progress meeting, they will be accepted as properly stating the activities and decisions of the meeting.
2. Persons challenging published Minutes shall reproduce and distribute copies of the challenge to all Minutes.
3. Challenge to Minutes shall be settled as priority portion of "old business" at the next regularly scheduled meeting.

END OF SECTION

SECTION 01310

CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: To assure adequate planning and execution of the Work so that the Work is completed within the number of calendar days allowed in the Contract, and to assist the Engineer in appraising the reasonableness of the proposed schedule and in evaluating progress of the Work, prepare and maintain the schedules and reports described in this Section.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Requirements for progress schedule: General Conditions.
3. Construction period: Form of Agreement.

C. Definitions: "Day", as used throughout the Contract unless otherwise stated, means calendar day.

1.2 QUALITY ASSURANCE

A. Employ a scheduler who is thoroughly trained and experienced in compiling construction schedule data, and in preparing and issuing periodic reports as required below.

B. Perform data preparation, analysis, charting, and updating in accordance with standards approved by the Engineer.

C. Approved scheduling software is Primavera P6 or Microsoft Projects latest version.

1. Submit all other products to the Engineer for approval.

D. Reliance upon the approved schedule:

1. The construction schedule as approved by the Engineer will be an integral part of the Contract and will establish interim completion dates for the various activities under the Contract.
2. Should any activity not be completed within 15 days after the stated scheduled date, the Owner shall have the right to require the Contractor to expedite completion of the activity by whatever means the Owner deems appropriate and necessary, without additional compensation to the Contractor.
3. Should any activity be 30 days or more behind schedule, the Owner shall have the right to perform the activity or have the activity performed by whatever method the Owner deems appropriate.
4. Costs incurred by the Owner and by the Engineer in connection with expediting construction activity shall be reimbursed by the Contractor.
5. It is expressly understood and agreed that failure by the Owner to exercise the option either to order the Contractor to expedite an activity or to expedite the activity by other means shall not be considered to set a precedent for any other activities.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Preliminary analysis: Within 10 calendar days after the Contractor has received the Notice to Proceed, submit electronic PDF of a preliminary construction schedule prepared in accordance with Part 3 of this Section.

C. Construction schedule: Within 10 calendar days after the Contractor has received the Engineer's approval to revisions of a preliminary construction schedule, submit electronic PDF of a construction schedule prepared in accordance with Part 3 of this Section.

1. Upon approval of construction schedule, submit electronic project scheduling file in Microsoft Project (latest version) format to the Engineer.

D. Periodic reports: On the first working day of each month following the submittal described in Paragraph 1.3.C above, submit electronic PDF and four prints of the construction schedule updated as described in Part 3 of this Section.

PART 2 - PRODUCTS

2.1 CONSTRUCTION ANALYSIS

A. Graphically show by bar chart the order and interdependence of all activities necessary to complete the work, and the sequence in which each activity is to be accomplished, as planned by the Contractor and his project field superintendent in coordination with all subcontractors whose work is shown on the diagram.

1. Provide two line bar chart; one for planned activity, and one for actual completion.

B. Include, but do not necessarily limit indicated activities to:

1. Project mobilization.
2. Submittal and approval of shop drawings and samples.
3. Procurement of equipment and critical materials.
4. Fabrication of special material and equipment, and its installation and testing.
5. Final cleanup.
6. Final inspecting and testing.
7. All activities by the Engineer that affect progress, required dates for completion, or both, for all and each part of the Work.

PART 3 - EXECUTION

3.1 PRELIMINARY ANALYSIS

A. Contents:

1. Show all activities of the Contractor under this Work for the period between receipt of Notice to Proceed and submittal of construction schedule.
2. Show the Contractor's general approach to remainder of the Work.
3. Show cost of all activities scheduled for performance before submittal and approval of the construction schedule.

3.2 CONSTRUCTION SCHEDULE

A. Provide a construction schedule incorporating all revisions from review of the preliminary analysis.

3.3 PERIODIC REPORTS

A. Provide monthly updates of the approved construction schedule.

1. Indicate "actual" progress for each activity on the bar chart.
2. Provide written narrative summary of revisions causing delay in the program, and an explanation of corrective actions taken or proposed.

3.4 REVISIONS

A. Make periodic revisions to the schedule to incorporate delays, early completion, etc.

B. Make only those revisions to approved construction schedule as are approved in advance by the Engineer.

END OF SECTION

SECTION 01340

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Make submittals required by the Contract Documents and revise and resubmit as necessary to establish compliance with the specified requirements.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications.
2. Individual requirements for submittals also may be described in pertinent sections of these specifications.

C. Work not included:

1. Unrequired submittals will not be reviewed by the Engineer.
2. The Contractor may require his subcontractors to provide drawings, setting diagrams, and similar information to help coordinate the work, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Engineer.

1.2 QUALITY ASSURANCE

A. Coordination of submittals:

1. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.
2. Verify that each item and the submittal for it conform in all respects with the specified requirements.
3. By affixing the Contractor's signature to each submittal, certify that this coordination has been performed.
4. Review and coordinate each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

B. Completeness of submittal:

1. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes.
2. Determine and verify all information relative to Contractor’s responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

C. "Or equal":

1. Where the phrase "or equal" occurs in the Contract Documents, do not assume that the materials, equipment or methods will be considered as

equal unless the item has been specifically so approved for this Work by the Engineer.
2. The decision of the Engineer shall be final.

D. The Engineer shall assume that no shop drawing or related submittal comprises a variation unless the Contractor advises the Engineer otherwise in writing.

1.3 SUBMITTALS

A. Within 15 calendar days after the Contractor has received the Owner's notice to proceed, submit:

1. Schedule for submittals including specification section, type of submittal and submittal date.
2. Construction schedule.
3. Schedule of partial payment requests.

B. Make submittals of shop drawings, samples, substitution requests and other items in accordance with the provisions of this Section.

PART 2 - PRODUCTS

2.1 SHOP DRAWINGS

A. Scale and measurements: Make shop drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the Work.

B. Large prints (11" x 17" or larger):

1. Submit shop drawings in the form of white copies.
2. Blueprints will not be acceptable.

C. Manufacturer's literature:

1. Where contents of submitted literature from manufacturers includes data not pertinent to the submittal, clearly show which portions of the contents are being submitted for review.
   a. Cross out or strikethrough all data not pertinent to the submittal.
2. Submit the number of copies which are required to be returned, plus four copies of electrical and three copies of all other submittals which will be retained by the Engineer.

D. Number of copies:

1. Submit all shop drawings electronically in PDF searchable format.

   a. Electronic version to be a searchable PDF with an internal table of contents.

E. Do not begin fabrication of equipment or materials prior to Engineer's approval of shop drawings.

2.2 VARIATIONS

A. With each submittal, provide specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the

Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

B. Provide an explanation of why the item(s) submitted are considered to be equal to the item(s) specified.

C. Failure to submit a written notice will result in rejection of the submittal.

2.3 SAMPLES

A. Provide sample or samples identical to the precise article proposed to be provided. Identify as described under "Identification of submittals" below.

B. Number of samples required:

1. Unless otherwise specified, submit samples in the quantity which is required to be returned, plus one which will be retained by the Engineer.
2. By prearrangement in specific cases, a single sample may be submitted for review and, when approved, be installed in the work at a location agreed upon by the Engineer.

2.4 COLORS AND PATTERNS

A. Unless the precise color and pattern is specifically called out in the Contract Documents, and whenever a choice of color or pattern is available in the specified products, submit accurate color and pattern charts to the Engineer for selection.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW OF SUBMITTALS

A. Before submitting a shop drawing or any related material, Contractor shall:

1. Determine and verify all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto.
2. Determine and verify the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work
3. Review each such submission for conformance with the means, methods, techniques, sequences, and operations of construction, and safety precautions and programs incidental thereto, all of which are the sole responsibility of Contractor.
4. Approve each such submission before submitting it.
5. Stamp and sign each such submission before submitting it.

B. Shop drawings and related materials shall be returned with comments provided that each submission has been specified and is stamped by the Contractor.

C. Shop drawings or material not specified or which have not been approved by the Contractor shall be returned without comment.

D. Contractor is to utilize the following stamp on all shop drawing submittals:

This shop drawing has been reviewed by [***NAME OF CONTRACTOR***] and approved with respect to the means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incidental thereto. [***NAME OF CONTRACTOR***] also warrants that this shop drawing complies with contract documents and comprises no variations thereto.

By: _____

Date: _____

E. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of the General Conditions and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of the General Conditions.

3.2 IDENTIFICATION OF SUBMITTALS

A. Consecutively number all submittals.

1. When material is resubmitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.
2. On resubmittals, cite the original submittal number for reference.

B. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.

C. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.

D. Maintain an accurate submittal log for the duration of the work, showing current status of all submittals at all times. Make the submittal log available to the Engineer for his review upon request.

3.3 GROUPING OF SUBMITTALS

A. Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for checking each item when it is received.

1. Partial submittals may be rejected as not complying with the provisions of the Contract.
2. The Contractor may be held liable for delays so occasioned.

3.4 TIMING OF SUBMITTALS

A. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.

B. In scheduling, allow at least twenty-five working days for review by the Engineer following his receipt of the submittal.

3.5 RESUBMITTAL SCHEDULE

A. For submittals marked "Furnish as Corrected" by the Engineer, resubmittal shall be within ninety (90) days of the review date shown on the Engineer's shop drawing review stamp.

B. For submittals marked "Revise and Resubmit", "Submit Specified Item", or "Rejected", resubmittal shall be within thirty (30) days of the review date shown on the Engineer's shop drawing review stamp.

3.6 ENGINEER'S REVIEW

A. Review by the Engineer does not relieve the Contractor from responsibility for errors which may exist in the submitted data.

B. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer.

C. Engineer’s review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

D. Engineer’s review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto.

E. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

F. Revisions:

1. Make revisions required by the Engineer.
2. If the Contractor considers any required revision to be a change, he shall so notify the Engineer as provided for in the General Conditions.
3. Make only those revisions directed or approved by the Engineer.
4. Submittals which have been reviewed and returned to the Contractor marked "Revise and Resubmit" or "Rejected" and which are resubmitted and not in an approvable state, will not be reviewed a third time unless payment for the third and any subsequent review is by the Contractor. The engineering costs for review shall be equal to the Engineer's charges to the Owner under the terms of the Engineering Agreement with the Owner.

END OF SECTION

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included:

1. Cooperate with the Owner's selected testing agency and all others responsible for testing and inspecting the work.
2. Provide such other testing and inspecting as are specified to be furnished by the Contractor in this Section and/or elsewhere in the Contract Documents.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications.
2. Requirements for testing may be described in various Sections of these specifications.
3. Where no testing requirements are described, but the Owner decides that testing is required, the Owner may require such testing to be performed under current pertinent standards for testing. Payment for such testing will be made as described in this Section.

C. Work not included:

1. Selection of testing laboratory: The Owner will select a prequalified independent testing laboratory.
2. Payment for initial testing: The Owner will pay for all initial services of the testing laboratory as further described in Article 2.1 of this Section.
3. Tests at point of manufacture as specified in other Sections of these documents are to be made with all costs borne by the Contractor.

1.2 QUALITY ASSURANCE

A. The testing laboratory will be qualified to the Owner's approval in accordance with ASTM E 329.

B. Testing, when required, will be in accordance with all pertinent codes and regulations, and with selected standards of the American Society for Testing and Materials.

1.3 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01640.

B. Promptly process and distribute required copies of test reports and related instructions to assure necessary retesting and replacement of materials with the least possible delay in progress of the work.

PART 2 - PRODUCTS

2.1 PAYMENT FOR TESTING

A. Initial services:

1. The Owner will pay for initial testing services requested by the Owner.
2. When initial tests indicate non-compliance with the Contract Documents, the costs of initial tests associated with that non-compliance will be deducted by the Owner from the Contract Sum.
3. Retesting: When initial tests indicate non-compliance with the Contract Documents, subsequent re-testing occasioned by the non-compliance shall be performed by the same testing agency and all costs there from will be deducted by the Owner from the contract sum.

2.2 CODE COMPLIANCE TESTING

A. Inspections and tests required by codes or ordinances, or by a plan approval authority, and which are made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents.

2.3 CONTRACTOR'S CONVENIENCE TESTING

A. Inspecting and testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

PART 3 - EXECUTION

3.1 COOPERATION WITH TESTING LABORATORY

A. Representatives of the testing laboratory shall have access to the work at all times and at all locations where the work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.

3.2 TAKING SPECIMENS

A. All specimens and samples for testing, and deliveries to laboratory, unless otherwise provided in the Contract Documents, shall be taken by the testing personnel. All sampling equipment and personnel will be provided by the testing laboratory. All deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

3.3 SCHEDULES FOR TESTING

A. Establishing schedule:

1. By advance discussion with the testing laboratory selected by the Owner, determine the time required for the laboratory to perform its tests and to issue each of its findings.
2. Provide all required time within the construction schedule.

B. Revising schedule: When changes of construction schedule are necessary during construction, coordinate all such changes with the testing laboratory as required.

C. Adherence to schedule: When the testing laboratory is ready to test according to the established schedule, but is prevented from testing or taking specimens due to incompleteness of the work, all extra charges for testing attributable to the delay may be back-charged to the Contractor and shall not be borne by the Owner.

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide temporary facilities needed for the work including, but not necessarily limited to:

1. Sanitary facilities.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications.
2. Permanent installation and hookup of the various utility lines are described in other Sections.

1.2 PRODUCT HANDLING

A. Maintain temporary facilities in proper and safe condition throughout progress of the work.

PART 2 - PRODUCTS

2.1 UTILITIES

A. Sanitary facilities:

1. Provide temporary sanitary facilities in the quantity required for use by all personnel.
2. Maintain in a sanitary condition at all times.
3. Strictly enforce their use.

2.2 PROJECT SIGNS

A. Provide and erect where directed a project sign.

1. Maintain in good condition until project completion.

B. Sign shall be approximately 4'x8' of 3/4" exterior plywood, mount on 4"x4" treated posts with bottom edge approximately 5' above ground line.

1. Comply with construction details, lettering and coloring as shown on Attachment No. 1 hereto.

2.3 CONFINED SPACE SAFETY EQUIPMENT

A. Work under this contract may require construction or work in a confined space, defined as any space having one or more of the following characteristics:

1. Limited openings for entry and exit.
2. Unfavorable natural ventilation.
3. Not designed for continuous worker occupancy.

B. The Contractor shall have on the job site at all times the following minimum safety equipment:

1. Gas monitor capable of testing and detecting for combustible gas, oxygen deficiency and hydrogen sulfide.
2. Confined space access and retrieval winch system.
3. Ventilating fan with large diameter ventilating hose.
4. Supplied air respirator, MSHA/NIOSH approved type.
5. Safety harness and life lines.

C. This equipment to be available for use by the Contractor, Engineer and Owner for the duration of the project.

D. All entries into or work within confined spaces to be conducted in accordance with the U.S. Department of Health and Human Services/National Institute for Occupational Safety and Health [DHHS (NIOSH)] Publication No. 87-113, A Guide to Safety in Confined Spaces.

PART 3 - EXECUTION

3.1 MAINTENANCE AND REMOVAL

A. Maintain temporary facilities and controls as long as needed for safe and proper completion of the work.

B. Remove such temporary facilities and controls as rapidly as progress of the work will permit, or as directed by the Engineer.

END OF SECTION

Attachment

CONSTRUCTION SIGN FOR AECOM PROJECTS

Black Lettering on White Background

Crosswell Neighborhood
Stormwater Improvements
Phase 1
For the
City of Sumter

3-1/2” letter height

2” letter height

3-1/2” letter height

ENGINEER:
AECOM
101 Research Drive
Columbia, SC 29203

CONTRACTOR:

2-1/2” letter height

2-1/2” letter height

2” letter height

Contractor’s Logo

Sign dimensions: 1200mm x 2400 mm x 19mm (4’ x 8’ x ¾”)
Exterior Plywood (A – B Grade)

PROJECT SIGN

60591852

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included:

1. Throughout progress of the Work, maintain an accurate record of changes in the Contract Documents, as described in Article 3.1 below.
2. Upon completion of the Work, deliver the recorded changes to the Engineer.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications.
2. Other requirements affecting Project Record Documents may appear in pertinent other Sections of these specifications.

1.2 QUALITY ASSURANCE

A. Delegate the responsibility for maintenance of Record Documents to one person on the Contractor's staff as approved by the Engineer.

B. Accuracy of records shall be such that future search for items shown on the Project Record Documents may rely reasonably on the information provided under this Section of the Work.

1.3 SUBMITTALS

A. The Engineer's approval of the current status of Project Record Documents may be a prerequisite to the Engineer's approval of requests for progress payment and request for final payment under the Contract.

B. Prior to submitting each request for progress payment, secure the Engineer's approval of the current status of the Project Record Documents.

C. Prior to submitting request for final payment, submit the final Project Record Documents to the Engineer and secure his approval.

1.4 PRODUCT HANDLING

A. Maintain the job set of Record Documents completely protected from deterioration and from loss and damage until completion of the Work and transfer to the Engineer.

B. In the event of loss of recorded data, use means necessary to again secure the data to the Engineer's approval.

1. Such means shall include, if necessary in the opinion of the Engineer, removal and replacement of concealing materials.
2. In such case, provide replacements to the standards originally required by the Contract Documents.

PART 2 - PRODUCTS

2.1 JOB SET DOCUMENTS

A. Promptly following receipt of the Owner's Notice to Proceed, secure from the Engineer, at no charge to the Contractor, one complete set of all Documents comprising the Contract.

PART 3 - EXECUTION

3.1 MAINTENANCE OF JOB SET

A. Immediately upon receipt of the job set described in above paragraph titled “JOB SET DOCUMENTS”, identify each of the Documents with the title, "RECORD DOCUMENTS - JOB SET".

B. Preservation:

1. Considering the Contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set to the approval of the Engineer.
2. Do not use the job set for any purpose except entry of new data and for review by the Engineer.
3. Maintain the job set at the site of Work as that site is designated by the Engineer.

C. Field work and making entries on Job Set Drawings:

1. Use erasable colored pencil, preferably red (not ink or indelible pencil) to delineate changes.
2. Show by station number location of all fittings, manholes, valves, wye locations, etc.
3. Reference all fittings and valves at least to two aboveground items reasonably safe from being relocated and indicate such references on the drawings.
4. Reference all pipelines from the center of the parallel roadway at least every 100 feet or where changes occur in the direction of the pipeline.
5. Reference all bores from the center of the roadway to the beginning and end of the casing and ductile iron pipe. Depths of bury must also be provided.
6. Reference all stream crossings and their distance from the center of the parallel roadway and the bridge or other obstruction. A profile of the stream crossing shall also be provided to show the depth of the pipeline under the stream.
7. Field measure and reference all fittings and valves to two aboveground items reasonably safe from being relocated and indicate such references on the drawings.
8. Show location of electrical conduit, pull boxes, etc.
9. Gravity sewers and storm sewers
   a. Provide survey grade state plane Geographic Information System (G.I.S.) electronic data horizontal coordinates for each manhole location.
   b. Provide ground elevation, top elevation and invert elevations for each manhole.
   c. Comply with Section 01050.1

D. Submittal:

1. Submit "marked-up" set of drawings to the Engineer.
2. Make any necessary additions as required by the Engineer.

END OF SECTION

SECTION 02060

DEMOLITION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Demolish and remove from the site those items so indicated on the Drawings, including buildings, building pads, parking and roadway areas, miscellaneous structures, poles, walls, utilities, signs, etc.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications.
2. Section 02110 - Clearing and Grubbing.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Comply with the International Building Code with due regard to the protection of the public and the provision of safeguards during the performance of the work.

C. Use equipment adequate in size, capacity and numbers to accomplish the work in a timely manner.

D. Comply with requirements of governmental agencies having jurisdiction.

E. Contractor is responsible for being aware of and complying with Asbestos NESHAP regulations, as well as other applicable codes, laws and regulations.

1. The Owner is to be notified immediately upon discovery of asbestos materials.

PART 2 - PRODUCTS

A. No products are required in this Section.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to the safe, timely, and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 DEMOLITION

A. General:

1. Prior to start of demolition, carefully study the Drawings and these Specifications.
2. In company with the Owner's representative, visit the site and verify the extent of demolition to be performed under this Contract.

B. Using only the means and equipment approved for this purpose by the governmental agencies having jurisdiction, demolish and completely remove from the job site the existing construction designated to be removed.

1. Shut off, cap, reroute, and otherwise protect existing public utility lines in accordance with the requirements of the public agency or utility having jurisdiction.
2. Remove rocks larger than 4” diameter, roots, wood, and debris.

C. Demolished material shall be considered to be property of the Contractor and shall be completely removed from the job site.

D. Use means necessary to prevent dust from becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

E. Use any means necessary to protect the public safety during the demolition process.

F. Use whatever means necessary to protect the adjacent structures from damage during demolition.

G. Protection of trees: It may become desirable to save certain trees in areas where cut or fill is eighteen inches or less and in parking areas. Consequently, the Contractor shall obtain approval from Engineer prior to removal of significant trees from such areas. The Contractor shall protect existing trees to remain during construction by constructing barricades around such trees as directed.

H. Erosion control: Construct and maintain erosion control as shown on the Drawings and in accordance with the local County's requirements.

3.3 MEASUREMENT AND PAYMENT

A. All work under this section will be measured and paid for as follows:

1. Removing existing catch basins will be paid for at the unit price per “each” as stated in the Bid Form and shall include cost of labor and all other materials and equipment necessary to remove and dispose of the catch basin and to restore disturbed areas to their existing or better condition.

2. Removal & Disposal of Strom Drainage Pipe will be paid for at the unit price per “linear foot” as stated in the Bid Form and shall include cost of labor and all other materials and equipment necessary to remove and dispose of the existing storm drainage pipe and to restore disturbed areas to their existing or better condition.

3. Remaining work: No separate measurement or direct payment will be made for the work under this Section and all costs for same shall be included in lump sum for the items for which it pertains on the Bid Form.

END OF SECTION

SECTION 02110

CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Remove trees, underbrush, undesirable growth, stumps, roots, etc., from the area to the limits shown on the Drawings, as specified herein, and as needed to meet the requirements of the construction shown in the Contract Documents.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 02260 - Erosion and Sediment Control.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Use equipment adequate in size, capacity and numbers to accomplish the work in a timely manner.

C. Comply with requirements of governmental agencies having jurisdiction.

PART 2 - PRODUCTS

No products are required for this work.

PART 3 - EXECUTION

3.1 AREA INCLUDED

A. All streets, parking areas, building pads, and any other areas as indicated on the Drawings.

3.2 PROCEDURES

A. Clearing and grubbing: The entire area within the limit lines described above shall be cleared and grubbed. Remove all vegetation, trees, brush, stumps, etc., from the area. All debris from this operation shall be burned if allowed by local regulations or shall otherwise be disposed of off the Owner's property.

B. Selective clearing shall be done in areas designated by the Engineer. Selective clearing shall consist of removing vegetation, brush, stumps, etc., from the area. Selected trees shall be left standing and care shall be taken not to damage trees to be left. All debris from this operation shall be burned if allowed by local

regulations or shall otherwise be disposed of off the Owner's property. Grubbing will not be required in areas designated for selective clearing.

C. Removal of trees and shrubs: All trees to be removed shall be felled in such a manner as to avoid injury to remaining trees and to other features not proposed for removal. Trees shall be cut up and the trunks, limbs, and other debris shall be removed from the site. Undesirable shrubs and small trees shall be selectively removed as directed.

D. Burning: Burning is not allowed.

E. Stumps and roots: All stumps and roots larger than 2" in diameter shall be completely removed by grubbing except in areas of building site, parking areas and drives, they may be cut off not less than 18" below any subgrade. The area of operation then shall be cleared of resulting debris and matted roots, weeds and other extraneous matter and such shall be hauled away from the site. Generally, all material that cannot be compacted to 90% maximum density in lawn areas and 95% of maximum density elsewhere shall be removed.

F. Protection of trees: It may become desirable to save certain trees in areas where cut or fill is eighteen inches or less and in parking areas. Consequently, the Contractor shall obtain approval from Engineer prior to removal of significant trees from such areas. The Contractor shall protect existing trees to remain during construction by constructing barricades around such trees as directed.

G. Erosion control: Construct and maintain erosion control as shown on the Drawings and in accordance with Section 02260: Erosion and Sediment Control, and the local County's requirements.

3.3 MEASUREMENT AND PAYMENT

A. No separate measurement or direct payment will be made for the work under this Section and all costs for same shall be included in lump sum for the items for which it pertains on the Bid Form.

END OF SECTION

SECTION 02210

SITE GRADING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Cut, fill, excavate, backfill, compact and grade the site as necessary to bring the roads, drives, building sites, paved areas and open areas to the lines and grades shown on the drawings.

1. The work includes, but is not necessarily limited to:

a. Roadway, parking area, drive and walk subgrade preparation.
b. Excavations and formations of embankments.
c. Dressing of graded areas, shoulders and ditches.

2. Classification: All excavation is unclassified and excavation of every description, regardless of material encountered within the grading limits of the project, shall be performed to the lines and grades indicated.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications.
2. Section 02110 - Clearing and Grubbing.
3. Section 02221 - Trenching, Backfilling for Utilities.
4. Section 02721 - Sewers: Storm Drainage.

C. Definitions:

1. Open areas: Open areas shall be those areas that do not include building sites, paved areas, street right-of-way and parking areas.
2. Maximum density: Maximum weight in pounds per cubic foot of a specific material.
3. Optimum moisture: Percentage of water in a specific material at maximum density.
4. Rock excavation: Excavation of any hard natural substance which requires the use of explosives and/or special impact tools such as jack hammers, sledges, chisels or similar devices specifically designed for use in cutting or breaking rock, but exclusive of trench excavating machinery. To be considered as rock excavation, the material shall be continuous; individual boulders or rocks in soil will not be considered rock excavation.
5. Muck: Materials unsuitable for foundation because of organic content, saturation to the extent that it is somewhat fluid and must be removed by dragline, dredge or other special equipment, are designated as muck. No extra payment will be made for muck removal.
6. Unsuitable material: Unsuitable material is defined as earth material unsatisfactory for its intended use and as classified by the soils technician. In addition to organic matter, sod, muck, roots and rubbish, highly plastic clay soils of the CH and MH descriptions, and organic soils of the OL and OH descriptions, as defined in the Unified Soil Classification System shall be considered as unsuitable material.
7. Suitable material: Where the term suitable material is used in specification sections pertaining to earthwork, it means earth or materials designated as being suitable for their intended use by soils technicians or

the Engineer. Suitable material shall be designated as meeting the requirements of the Unified Soil Classification System types SW, GW, GC, SC, SM, ML, CL or as designated in these specifications.

8. Select material: Select material is defined as granular material to be used where indicated on the drawings or where specified herein consisting of soils conforming to the Unified Soil Classification types SW, SM, GW or GM or as otherwise approved by the Engineer as select fill. Select material shall contain no stones or rubble larger than 1-1/2" in diameter.
9. Crushed stone (gravel): Crushed stone shall be No. 57 aggregate or equal conforming to ASTM C-33.
10. Excavation: Excavation is defined as unclassified excavation of every description regardless of materials encountered.

D. The Contractor must determine for himself the volume of material required by the site.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Comply with requirements of governmental agencies having jurisdiction.

C. A testing laboratory retained by the Owner will make such tests as are deemed advisable. The Contractor shall schedule his work so as to permit a reasonable time for testing before placing succeeding lifts of fill material and shall keep the laboratory informed of his progress. The cost of the initial tests shall be paid for by the Owner. Subsequent tests required as a result of improper compaction shall be paid for by the Contractor.

1.3 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01640.

1.4 JOB CONDITIONS

A. Notification of intent to excavate:

1. South Carolina Underground Utility Damage Prevention Act (S.C. Code Ann, 58-35-10, CT-SEQ, Supp. 1978) requires persons to ascertain the location of underground public utility property prior to excavation or demolition in certain situations. The Act also requires such persons to give timely notice of intent to excavate or demolish prior to commencing such operations. Failure to comply could subject the violator to a civil penalty of up to one thousand dollars ($1,000) for each violation of the Act.
2. Notification of intent to excavate may be given by calling this toll free number: 1-800-922-0983.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Soil material used as fill, backfill, subgrade for structures or pavements, embankments, or site grading shall consist of suitable material as found available on site until such supply of on-site material is depleted.

1. Provide suitable material free from organic matter and deleterious substances, containing no rocks or lumps over 6" in greatest dimension, and with not more than 15% of the rocks or lumps larger than 2-1/2" in their greatest dimension.
2. Do not permit rocks having a dimension greater than 1" in the upper 6" of fill or embankment.

B. Should the quantity of suitable on-site material be insufficient to complete the work, suitable borrow material as approved by the Engineer shall be provided by the Contractor at no additional expense to the Owner.

C. Select materials may be provided from on-site if acceptable material as approved by the Engineer is available on site. Otherwise approved select material shall be provided by the Contractor from an off-site source.

2.2 TOPSOIL

A. Use topsoil consisting of material removed from the top 3" to 6" of existing on-site soils or from off site.

1. Maximum clay content of 25%.

B. Use topsoil containing no stones, roots, large clods of soil or other foreign matter.

C. Stockpile topsoil separate from other excavated material.

2.3 WEED KILLER

A. Provide a dry, free-flowing, dust free chemical compound, soluble in water, capable of inhibiting growth of vegetation and approved for use on this work by governmental agencies having jurisdiction.

2.4 EQUIPMENT

A. Use equipment adequate in size, capacity and numbers to accomplish the work in a timely manner without undue waste or damage of material.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Clearing and grubbing: Clear and grub areas to be graded prior to commencement of the grading operations.

B. Where so directed by the Owner, protect and leave standing designated desirable trees.

C. Complete any demolition and/or removal work as may be required prior to grading operations.

D. Dispose of all clearing, grubbing and demolition debris and other deleterious material off the project site. Vegetation, roots, brush, rubbish, stumps, etc. may be burned on-site where permitted by local authorities and regulations and approved by the Engineer.

E. Topsoil: Strip topsoil to a depth of 3" to 6" without contamination from the subsoil and stockpile topsoil separate from other excavated materials.

1. Transport and deposit topsoil in storage piles convenient to areas that are to receive topsoil or in other locations as indicated or approved by the Engineer.
2. Deposit topsoil in areas that are already graded and will not be disturbed by on-going construction.
3. Dispose of unsuitable or unusable stripped material off-site or as otherwise directed by the Engineer.

F. Sampling and preliminary testing:

1. Prior to beginning the grading operations, the Contractor shall submit to the Engineer his proposed sequence of excavation operations.
2. Based upon the sequence of excavation, samples of the fill materials will be obtained as excavation proceeds and tested for grain size permeability and moisture density relationship using the Standard Proctor Method (ASTM D698, Method A).
3. Allow sufficient time for completion of laboratory tests before any fill operations begin, using the soils being tested.

3.3 FINISH ELEVATIONS AND LINES

A. Construct areas outside of building or structure lines true to grades shown.

1. Where no grade is indicated, shape finish surface to drain away from buildings or structures, as approved by the Engineer.

B. Degree of finish shall be that ordinarily obtainable from bladegrader, supplemented with hand raking and finishing.

C. Finish surfaces to within 0.10' above or below the established grade or approved cross section.

3.4 GENERAL PROCEDURES

A. Existing utilities:

1. Unless shown to be removed, locate and protect active utility lines shown on the drawings or otherwise made known to the Contractor prior to excavating. If damaged, repair or replace at no additional cost to the Owner.
2. If active utility lines are encountered and are not shown on the drawings or otherwise made known to the Contractor, promptly notify the Engineer and take necessary steps to assure that service is not interrupted.
3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.
4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Engineer and secure his instructions.
5. Do not proceed with permanent relocation of utilities until written instructions are received from the Engineer.

B. Protection of persons and property:

1. Barricade open holes and depressions occurring as part of this Work, and post warning lights on property adjacent to or with public access.
2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout and other hazards created by operations under this Section.

C. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

D. Maintain access to adjacent areas at all times.

E. Excavate and backfill in a manner and sequence that will provide proper drainage at all times.

3.5 EXCAVATING (CUTS)

A. Perform excavating of every type of material encountered within the limits of the Work to the lines, grades and elevations indicated and specified herein.

B. Provide sloping, sheeting, shoring, and bracing for excavations conforming with 29CFR1926 Subpart P-Excavations and the Contract Documents.

C. Suitable excavated materials:

1. Use all suitable materials removed from the excavation as far as practicable in the formation of the embankments, subgrades, shoulders, building sites and other places as directed.
2. Unless otherwise indicated on the drawings or approved by the Engineer, surplus suitable material shall be removed from the site and disposed of by the Contractor.

D. Unsuitable excavated material: Remove from the site and dispose of all unsuitable material unless otherwise approved by the Engineer.

E. Rock excavation:

1. Notify the Engineer upon encountering rock or similar material which cannot be removed or excavated by conventional earth moving or ripping equipment.
2. Do not use explosives without written permission from the Engineer.
3. When explosives are permitted, use only experienced powdermen or persons who are licensed or otherwise authorized to use explosives. Store, handle and use explosives in strict accordance with all regulatory bodies and the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America, Inc.
4. The Contractor shall be solely responsible for any damage resulting from the use of explosives.
5. The Contractor is responsible for securing all permits required in performing this work.

F. Unauthorized excavation:

1. Excavation of material to depths below the grades indicated unless so directed by the Engineer will be deemed unauthorized excavation.

2. Unauthorized overexcavation shall be backfilled and compacted without any additional expense to the Owner.

G. Authorized overexcavation:

1. In the event that it is necessary to remove unsuitable material to a depth greater than that shown on the drawings or otherwise specified, the Contractor shall remove, replace and compact such material with suitable material as directed by the Engineer at no additional expense by the Owner.

3.6 FILLING AND BACKFILLING

A. Use fills formed of suitable material placed in layers of not more than 8" in depth measured loose and rolled and/or vibrated with suitable equipment until compacted.

B. Do not place rock that will not pass through a 6" diameter ring within the top 12" of the surface of the completed fill or rock that will not pass through a 3" diameter ring within the top 6" of the completed fill.

C. Do not use broken concrete or asphaltic pavement in fills.

D. Selection of borrow material:

1. Material in excess of that available on the site shall be suitable material furnished by the Contractor from private sources selected by the Contractor. The material shall be approved by the Engineer before use. All expenses involved in securing, developing, transporting and placing the material shall be borne by the Contractor.
2. Provide delivery tickets with each load of imported borrow material delivered to the site, stating the type of fill material and the quantity.
   a. Provide at the time of delivery.
   b. No payment will be made for imported borrow material for which delivery tickets were not submitted to the Owner or the Owner's Representative at time of delivery.

E. Placing and compacting:

1. Place backfill and fill materials in layers not more than 8" in loose depth with a moisture condition of ± 2% of optimum.
2. Before compacting, moisten or aerate each layer as necessary to provide the optimum moisture content.
   a. At the time of compaction, the water content of the material must be at optimum water content or within 2% above optimum.
   b. Aerate material containing excessive moisture by blading, discing, or harrowing to hasten the drying process.
3. Compact each layer to required percentage of maximum density for the area.
4. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
5. Place backfill and fill materials evenly adjacent to structures, to required elevations.
6. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around the structures to approximately the same elevation in each lift.

F. Moisture control:

1. Do not use soil material that is either too dry or too wet to achieve proper compaction.
2. Where subgrade or layer of soil material is too dry to achieve proper compaction, uniformly apply water to surface of soil material such that free water does not appear on the surface during or subsequent to compacting operations.
3. Remove and replace, or scarify and air dry, soil material that is too wet to permit compacting to the specified density.
4. Soil material that has been removed because it is too wet to permit compacting may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value as determined by moisture-density relation tests approved by the Engineer.

G. Compaction requirements:

1. Compact soils to not less than the following percentages of maximum dry density as determined in accordance with ASTM D698, Method A (Standard Proctor).
2. Fill beneath structures and beneath an area extending 10' beyond the limits of the foundation:

Top 12" of subgrade	100%
All other fill material	98%

3. Fill beneath roadway:

Top 12" of subgrade	100%
All other fill material	95%

4. Embankments:

Top 12" of subgrade	98%
All other fill material	95%

5. Fill beneath walkways:

Top 12" of subgrade	95%
All other fill material	90%

6. Lawn and unpaved open areas:

All other fill material	90%

3.7 FINISH GRADING

A. General:

1. Uniformly grade the areas within limits of grading under this Section, including adjacent transition areas.
2. Smooth the finished surfaces within specified tolerance.
3. Grade with uniform levels or slopes between points where elevations are shown on the drawings, or between such points and existing grades.
4. Where a change of slope is indicated on the drawings, construct a rolled transition section having a minimum radius of approximately 8'0", unless adjacent construction will not permit such a transition, or if such a transition defeats positive control of drainage.

B. Grading adjacent to structures: Grade areas adjacent to buildings to achieve drainage away from the structures and to prevent ponding.

C. Ditches and gutters and swales:

1. Cut accurately to the cross sections, grades and elevations shown.
2. Maintain excavations free from detrimental quantities of leaves, sticks, trash and other debris until completion of the work.
3. Dispose of excavated materials as specified herein; do not in any case deposit materials within 3'0" of the edge of a ditch.

3.8 FIELD QUALITY CONTROL

A. Secure the Engineer's construction review and observation and approval of subgrades and fill layers before subsequent construction is permitted thereon.

B. Field density determinations will be made, at no cost to the Contractor, to ensure that the specified densities are being obtained. Field density tests will be performed as determined by the Engineer, considering the following:

1. At areas to receive paving, at least one field density test for every 5,000 sq. ft. of subgrade area, but not less than three tests.
2. In each compacted fill layer, one field density test for every 5,000 sq. ft. of overlaying paved area, but not less than three tests.
3. In fill beneath structures, one field density test for every 2,500 sq. ft. in each layer.
4. Other tests as deemed necessary by the Engineer.

C. If, in the Engineer's opinion based on reports of the testing laboratory, subgrade or fills which have been placed are below specified density, provide additional compacting and testing until specified requirements are met.

1. Additional testing will be provided by the Owner's selected testing laboratory and all costs for the additional testing will be borne by the Contractor.

D. Proofrolling:

1. The Contractor shall proofroll subgrade of areas to receive paving, structures on fill or impervious lining material.
   a. Make not less than 3 passes of a 25 to 50 ton rubber tired roller over the full area.
   b. Unstable, soft or otherwise unsuitable materials revealed by the proofrolling shall be removed and replaced with satisfactory materials, compacted as specified herein.

3.9 PLACING TOPSOIL

A. Upon completion of site grading and other related site work, topsoil shall be uniformly spread over the graded or improved areas. Topsoil shall be evenly distributed to conform to final grade elevations shown on the plans.

B. Place, level and lightly compact topsoil to a depth of not less than 3".

C. Maintain topsoil free of roots, rocks, debris, clods of soil and any other objectionable material which might hinder subsequent grassing or mowing operations.

D. Any surplus materials shall be disposed of in approved areas on the site.

3.10 MAINTENANCE

A. Protection of newly graded areas:

1. Protect newly graded areas from traffic and erosion, and keep free from trash and weeds.
2. Repair and re-establish grades in settled, eroded and rutted areas to the specified tolerances.

B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape, and compact to the required density prior to further construction.

3.11 MEASUREMENT AND PAYMENT

A. No separate measurement or direct payment will be made for the work under this Section and all costs for same shall be included in the price bid for the item to which it pertains.

END OF SECTION

SECTION 02221

TRENCHING, BACKFILLING FOR UTILITIES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Trench, backfill, and compact as specified herein and as needed for installation of underground utilities associated with the Work.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
2. Section 02721 - Sewers: Storm Drainage.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

1.3 JOB CONDITIONS

A. Existing utilities:

1. There now exists in the construction areas, waterworks, storm drainage, sanitary sewers, street paving, gas mains and other utilities.
2. Approximate location of certain underground lines and structures are shown on the plans for information only, other underground lines or structures are not shown.
3. Locate these and other possible unknown utility lines using electronic pipe finder, or other approved means.
4. Locate, excavate and expose all existing underground lines in advance of trenching operations.
5. The Contractor will be held responsible for the workmanlike repair of any damage done to any of these utilities in the execution of his work under this Section.
6. The Contractor shall familiarize himself with the existing conditions and be prepared to adequately care for and safeguard himself and the Owner from damage.

B. Notification of intent to excavate:

1. South Carolina Underground Utility Damage Prevention Act (S.C. Code Ann, 58-35-10, CT-SEQ, Supp. 1978) requires persons to ascertain the location of underground public utility property prior to excavation or demolition in certain situations. The Act also requires such persons to give timely notice of intent to excavate or demolish prior to commencing such operations. Failure to comply could subject the violator to a civil penalty of up to one thousand dollars ($1,000) for each violation of the Act.

2. Notification of intent to excavate may be given by calling this toll free number: 1-888-721-7877.

C. Protecting trees, shrubbery and lawns:

1. Trees and shrubbery in developed areas and along the trench line shall not be disturbed unless absolutely necessary, and subject to the approval of the Engineer.
   a. Any such trees and shrubbery necessary to be removed shall be heeled in and replanted.
2. Where trenches cross private property through established lawns, sod shall be cut, removed, stacked and maintained in suitable condition until replacement is approved by the Engineer.
   a. Topsoil underlying lawn areas shall be removed and kept separate from general excavated materials.

D. Clearing:

1. Perform all clearing necessary for installation of the complete work.
2. Clearing shall consist of removing all trees, stumps, roots, brush and debris in the rights-of-way obtained for the Work.
3. All timber of merchantable size shall remain the property of the Owner and shall be trimmed and cut in such lengths as directed and stacked along the edge of the right-of-way.
4. All other material, including trimmings from above, shall be completely disposed of in a satisfactory manner.

E. Removing and resetting fences:

1. Where existing fences must be removed to permit construction of utilities:
   a. Remove such fences and, as the Work progresses, reset the fences in their original location and condition.
   b. Provide temporary fencing or other safeguards as required to prevent stock and cattle from wandering to other lands.

F. Restoration of disturbed areas:

1. Restore all areas disturbed by, during or as a result of construction activities to their existing or better condition.
   a. For existing areas with sod type grasses, replace with new sod. Existing sod may be reused where properly removed and stored.
2. Do not interpret this as requiring replacement of trees and undergrowth in undeveloped sections of the rights-of-way.

G. Minimizing silting and bank erosion during construction:

1. During construction, protective measures shall be taken and maintained to minimize silting and bank erosion of creeks and rivers adjacent to the work being performed during construction.

PART 2 - PRODUCTS

2.1 EXCAVATED MATERIALS

A. Perform all excavation of every description and of whatever substances encountered to depths indicated or specified.

B. Pile material suitable for backfilling in an orderly manner at safe distance from banks or trenches to avoid overloading and to prevent slides or cave-ins.

C. Remove and deposit unsuitable or excess materials as directed by the Engineer.

2.2 BACKFILL MATERIALS

A. Provide from materials excavated for installation of utility.

1. Select soil material free from organic matter and deleterious substances, containing no rocks or lumps over 2" in greatest dimension for backfill up to 12" above top of utility being covered.
2. Do not permit rocks larger than 2" in greatest dimension in top 6" of backfill.

2.3 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

B. Should the quantity of suitable on-site material be insufficient to complete the work, provide suitable borrow material as approved by the Engineer at no additional expense to the Owner.

C. Provide select materials from on-site if acceptable material as approved by the Engineer is available on-site. Otherwise, provide approved select material from an off-site source.

PART 3 - EXECUTION

3.1 PROCEDURES

A. Existing utilities:

1. Unless shown to be removed, protect active utility lines shown on the drawings or otherwise made known to the Contractor prior to trenching. If damaged, repair or replace at no additional cost to the Owner.
2. If active utility lines are encountered and are not shown on the Drawings or otherwise made known to the Contractor, promptly take necessary steps to assure that service is not interrupted.
3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.
4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Engineer and secure his instructions.
5. Do not proceed with permanent relocation of utilities until written instructions are received from the Engineer.

B. Locations within streets or highways:

1. Comply with South Carolina Department of Transportation's (SCDOT) "Encroachment Permit" issued for the Work, and the South Carolina Department of Transportation's (SCDOT) "*A Policy for Accommodating Utilities on Highway Rights-of-Way*".

2. Take all precautions and comply with all requirements as may be necessary to protect the improvements, including barricades for protection of traffic.
3. Keep minimum of one lane open to traffic at all times where utility crosses street or highway.

C. Protection of persons and property:

1. Barricade open holes and depressions occurring as part of the Work, and post warning lights on property adjacent to or with public access.
2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout and other hazards created by operations under this Section.

D. Dewatering:

1. Remove all surface and subsurface waters from excavations and maintain the excavation in a dry condition during construction operations.
2. Maintain the ground water level a minimum of 3-feet below the trench bottom during excavation, installation and backfilling.
   a. Material disturbed below the invert elevation due to improper dewatering shall be removed and replaced with crushed stone or lean concrete at no expense to the Owner.
   b. Use sumps, pumps, drains, trenching, wells, vacuum or well point system as necessary to maintain the ground water level a minimum of 3-feet below the trench bottom and maintain a dry excavation.
   c. Dewatering by trench pumping will not be permitted if migration of fine grained natural material (running sand) from bottom, side walls or bedding material will occur.
   d. Provide monitoring wells sufficient in size, location, number and depth to monitor the ground water level in the construction area during excavation and backfill operations.
   e. Maintain dewatering operations until backfilling and compaction operations are complete.
3. Water pumped or drained from trenches must be treated by an appropriately sized sediment and erosion control device prior to leaving the site. Discharging untreated or contaminated dewatering effluent is prohibited.
   a. Contractor is responsible for acquiring all permits required to discharge the water and shall protect waterways from turbidity during the operation.
   b. Prevent flooding of streets, roadways, or private property.
   c. Prevent onsite erosion that can be caused by concentrated discharges related to dewatering pumping, drains, or trenching.
   d. Provide engines driving dewatering pumps with residential type mufflers.

E. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

F. Maintain access to adjacent areas at all times.

3.2 TRENCH EXCAVATION (Unclassified)

A. Provide sloping, sheeting, shoring, and bracing for excavations conforming with 29CFR1926 Subpart P-Excavations and the Contract Documents.

B. Remove all materials of whatever substance encountered.

C. Where trenching occurs in existing lawns, remove turf in sections and keep damp. Replace turf upon completion of the backfilling.

D. Open cut:

1. Excavate for utilities by open cut.
2. If conditions at the site prevent such open cut, and if approved by the Engineer, tunneling may be used.
3. Short sections of a trench may be tunneled if, in the opinion of the Engineer, the conductor can be installed safely and backfill can be compacted properly into such tunnel.
4. Remove boulders and other interfering objects, and backfill voids left by such removals, at no additional cost to the Owner.
5. Remove wet or otherwise unstable soil incapable of properly supporting the utility, as determined by the Engineer, to depth required and backfill to proper grade with stone bedding material, at no additional cost to the Owner.
6. Excavating for appurtenances:
   a. Excavate for manholes and similar structures to a distance sufficient to leave at least 12" clear between outer surfaces and the embankment or shoring that may be used to hold and protect the banks.
   b. Overdepth excavation beyond such appurtenances that has not been directed will be considered unauthorized. Fill with sand, gravel, or lean concrete as directed by the Engineer, and at no additional cost to the Owner.

E. Trench to the minimum width necessary for proper installation of the utility, with sides as nearly vertical as possible. Accurately grade the bottom to provide uniform bearing for the utility.

F. Provide sheeting and shoring necessary for protection of the Work and for the safety of personnel.

1. Remove in units when level of backfilling has reached the elevation necessary to protect the utility work and adjacent property.
2. Sheeting at the bottom of trenches over 10’ deep for sewers 15” and larger in size, shall remain in place and be cut off no less than 2” above top of pipe, at no additional cost to the Owner.

G. Depressions:

1. Dig bell holes and depressions for joints after the trench has been graded. Provide uniform bearing for the pipe on prepared bottom of the trench.
2. Except where rock is encountered, do not excavate below the depth indicated or specified.
3. Where rock is encountered, excavate rock to a minimum overdepth of 4" below the trench depth indicated or specified, and to provide 6" clearance in any horizontal direction from all parts of the utility and appurtenances.

H. Special requirements relating to excavation for specific types of utilities shall comply with the following:

1. Water distribution lines:

a. Provide depth of cover shown or minimum cover of 36", whichever is greater.
b. Where minimum cover only is required, carry excavations to depths necessary to properly grade the pipe on tangents and vertical curves as directed by the Engineer.
c. Provide minimum clearance of 6" between pipe walls and trench walls or sheeting and bracing lines.
d. If minimum cover of 36" cannot be provided, then thermoplastic piping may not be used. Use ductile iron piping or other Engineer-approved material.

2. Sanitary or storm sewer lines:
a. Comply with requirements of Section 02722 and Section 02721.
b. Do not excavate trench more than 200' ahead of pipe laying, unless permitted by Engineer.
c. Maintain trench sides vertical to point not less than 2' above top of pipe.
d. Upper portion of trench may be sloped to any width which will not cause damage to adjoining structures, utilities, pavements or private property.

3. Sewers, Sanitary Pressure: (Force Main):
a. Comply with requirements of Section 02723.
b. Grade trenches to avoid high points, unless otherwise indicated.
c. Provide minimum cover of 36".
d. Provide minimum clearance of 6" between pipe walls and trench wall or sheeting and bracing lines.
e. If minimum cover of 36" cannot be provided, then thermoplastic piping may not be used. Use ductile iron piping or other Engineer-approved material.

4. Electrical conduit:
a. Provide depth of cover shown or minimum cover of 36", whichever is greater.
b. Where minimum cover only is required, carry excavations to depths necessary to properly grade the conduit on tangents and vertical curves as directed by the Engineer.
c. Provide minimum clearance of 12" between conduit and trench wall or sheeting and bracing lines.
d. If minimum cover of 36" cannot be provided, then thermoplastic piping may not be used. Use ductile iron piping or other Engineer-approved material.

5. Gas distribution lines:
a. Provide depth of cover shown or minimum cover of 48", whichever is greater.
b. Where lines are constructed in the rights-of-way of the South Carolina Department of Transportation, provide minimum cover of 48" below the elevation of the pavement.
c. Where minimum cover only is required, carry excavations to depths necessary to properly grade the pipe on tangents and vertical curves as directed by the Engineer.
d. Grade trenches to avoid high points.
e. Provide minimum clearance of 6" between pipe walls and trench walls or sheeting and bracing lines.

I. Comply with pertinent OSHA regulations in regards to the excavation of utilities.

3.3 BACKFILLING

A. General:

1. Backfill trenches and excavations immediately after the pipes are laid, unless other protection is directed or indicated.
2. Select and deposit backfill materials with special reference to the future safety of the pipes.
3. Reopen trenches which have been improperly backfilled, to a depth as required for proper compaction. Refill and compact as specified, or otherwise correct to the approval of the Engineer.
4. Surplus material shall be disposed of as directed by the Engineer.
5. Original surface shall be restored to the approval of the Engineer.
6. Maintain proper dewatering during backfill and compaction operations.

B. Lower portion of trench:

1. Deposit approved backfill and bedding material in layers of 6" maximum thickness, and compact with suitable tampers to the density of the adjacent soil until there is a cover of not less than 24" over sewers and 12" over other utility lines.
2. Take special care in backfilling and bedding operations not to damage pipe and pipe coatings.

C. Remainder of trench:

1. Except for special materials for pavements, backfill the remainder of the trench with material free from stones larger than 6" or 1/2 the layered thickness, whichever is smaller, in any dimension.
2. Deposit backfill material in layers not exceeding the thickness specified, and compact each layer to the minimum density directed by the soil engineer.

D. Adjacent to buildings: Mechanically compact backfill in 6" layers within ten (10') feet of buildings.

E. Under roads, streets and other paved areas:

1. Mechanically tamp in 6" layers using heavy duty pneumatic tampers or equal.
2. Tamp each layer to a density equivalent of not less than 100% of an ASTM D 698 Proctor Curve.
3. Provide additional compaction by leaving the backfilled trench open to traffic while maintaining the surface with crushed stone.
4. Refill any settlement with crushed stone and continue such maintenance until replacement of pavement is authorized by the Engineer.

F. Undeveloped areas:

1. Backfill in wooded, swampy or undeveloped areas shall be as specified hereinbefore, except that tamping of the backfill above a level 2' over the top of the pipe will not be required.
2. Mound excavated material neatly over the ditch to provide for future settlements.

3.4 MEASUREMENT AND PAYMENT

A. Unclassified excavation for trenching:

1. No measurement or direct payment will be made for the work under this Section and all costs for same shall be included in the price bid for the utility line to which it pertains.

END OF SECTION

SECTION 02260

EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide protection of the environment during the construction of this project to reduce soil erosion and siltation to the lowest reasonably achievable level.

1.2 GENERAL

A. Exercise every reasonable precaution, throughout the life of the project, to prevent the eroding of soil and the silting of rivers, streams, lakes, reservoirs, other water impoundments, ground or roadway surfaces, or other property. Erosion control practices to be used for this project are shown on the drawings and are to conform to South Carolina Department of Health and Environmental Control regulations.

1.3 INSPECTIONS

A. Inspection and monthly reporting to SCDHEC will be required in the NPDES General Permit for Storm Water Discharges From Large and Small Construction Activities SCR100000 (2006 CGP).

1. Inspections must be performed by qualified personnel who meet the requirements listed in Section 3.10.D of the 2006 CGP.

PART 2 - PRODUCTS

2.1 CRUSHED STONE

A. Provide No. 1 aggregate (ASTM C 33) as defined in Section 815 of the SCDOT Standard Specifications for Highway Construction, Latest Edition, for the stabilized construction entrance and exit.

B. Provide #57 crushed stone for temporary sediment barriers around inlets and for temporary stone check dams.

2.2 GRASSING

A. Comply with Section 02930 - Grassing.

2.3 SILT FENCE

A. All posts to be self-fastener angle steel, 5' in length.

1. Wooden posts are not acceptable.

B. Woven wire shall conform to the requirements of ASTM A 116, Class I zinc coating for wire. Each woven square shall measure 6" x 6". The top and bottom wires shall be 10 gauge. All other wires shall be 12-1/2 gauge.

1. Securely attach woven wire to posts with wire ties.

C. Provide filter fabric meeting the requirements of the South Carolina Department of Health and Environmental Control (SCDHEC), complying with the most current edition of the SCDOT Standard Specifications for Highway Construction and appearing on the SCDOT Approved Materials Sheet #34.

1. Limit splices in filter fabric using continuous rolls whenever possible.
2. Whenever splices are necessary a minimum overlap of 6" is required and all splices must occur at a post so that the integrity of the fence is not compromised.
3. Securely attach filter fabric to top of woven wire and at posts with wire ties.

D. Silt fences should be continuous and transverse to the flow. The silt fence should follow the contours of the site as closely as possible. Place the fence such that the water cannot runoff around the end of the fence.

2.4 EROSION CONTROL BLANKET

A. Use erosion control blanket S150, from North American Green or approved equal.

1. Use Biostakes where staples are required or indicated on the drawings for stabilization.
   a. Staple in pattern recommended by blanket manufacturer.
2. Staple locations must be clearly marked on the blanket when stakes are used.

2.5 RIP-RAP

A. Comply with Section 02270 - Rip-Rap.

2.6 FILTER FABRIC (Temporary Stone Check Dam)

A. Use Stabilenka Filter Fabric (T-140N), Mirafil (140N) or approved equal.

2.7 SEDIMENT TUBES

A. Use sediment tubes as designated on the plans to control erosion along contours, around inlets, and in drainage conveyance swales.

B. Use sediment tubes manufactured by an experienced manufacturer producing tubes for erosion control.

C. Tube fill is to be composed of 100% weed free materials consisting of a mix of some or all of the following: curled excelsior wood, natural coconut fibers, hardwood mulch and agricultural straw.

D. Tubular netting is to be constructed of a flexible outer netting that will contain the fill materials and sediment. Netting is to be constructed from seamless high density polyethylene, polyester, and/or ethyl vinyl acetate, photodegradable materials, treated with ultraviolet stabilizers.

E. Tubes are to be minimum 20-inches in diameter with minimum weight of 3.2 lbs per foot +/- 10%. Minimum tube length is 10-feet. Netting weight is to be 0.35 oz/foot minimum.

PART 3 - EXECUTION

3.1 GENERAL

A. Construct and maintain all erosion control measures until the substantial completion of the project.

3.2 TEMPORARY CONSTRUCTION ENTRANCE/EXIT

A. Construct a gravel area or pad at points where vehicles enter and leave a construction site.

B. Clear the entrance and exit area of all vegetation, roots, and other objectionable material and properly grade and place gravel to the grade and dimensions shown on the plans.

C. Construct drainage channels to carry water to a sediment trap or other suitable outlet.

D. Use geotextile fabrics to improve stability of the foundation in locations subject to seepage or high water table.

E. Maintain the gravel pad in a condition to prevent mud or sediment from leaving the construction site by periodic top dressing with two inches of stone.

F. After each rainfall, inspect any structure used to trap sediment and clean it out as necessary.

G. Immediately remove objectionable materials spilled, washed, or tracked onto public roadways.

3.3 TEMPORARY GRASSING

A. Provide a temporary cover for erosion control on disturbed areas that will remain unstabilized for a period of more than 30 days in accordance with Section 02930.

B. This practice applies to cleared areas, diversions, dams, temporary sediment basins, temporary road banks, and topsoil stockpiles where vegetation is needed for less than 1 year.

C. Provide grassing on slope 5% or greater within 14 days of disturbance. Comply with Section 02930.

3.4 SILT FENCE

A. Provide silt fence barrier where shown on the plans and on utility construction parallel to the disturbed trench where perpendicular sheet flow runoff occurs on disturbed areas with slopes greater than 4%.

B. Place at the extreme limits of the area to be disturbed as shown.

C. Construct temporary sediment barriers of filter fabric, buried at the bottom, stretched and supported by posts and install below small disturbed areas as indicated on the drawings to retain sediment by reducing the flow velocity to allow sediment deposition.

D. Space posts 10'-0" on center, maximum or as indicated on the drawings.

E. Remove sediment deposits prior to reaching one-third height of the fence.

F. Monitor site frequently and place additional silt fencing should evidence indicate that erosion is about to occur at locations other than those shown on plan.

3.5 INLET PROTECTION

A. Construct temporary sediment barriers around storm drain curb inlets using block and gravel as indicated on the drawings.

B. Construct metal frame barriers around grate and frame of drop inlets as indicated on the drawings.

C. Inspect structure after each rainfall and repair as required.

D. Remove sediment when trap reaches one-half capacity.

E. Remove structure when protected areas have been stabilized.

3.6 EROSION CONTROL BLANKET

A. Provide on areas as shown on the plans or on all embankments with slopes equal to or steeper than 2-1/2:1.

3.7 TEMPORARY STONE CHECK DAMS

A. Utilize temporary stone check dams as indicated on the plans or directed by Engineer.

B. Provide temporary stone check dams constructed of both rip-rap and #57 stone, as illustrated on the plans.

3.8 SEDIMENT TUBES

A. Construct small U-shaped trench that is 20% of depth of tube perpendicular to stormwater flow pattern.

B. Anchor tube in trench according to manufacturers recommendations.

C. Compact the upstream soil surface adjacent to the tube.

D. Backfill sediment tube with coarse filter material on the upstream side.

E. Follow manufactures recommendation on installation.

F. Maintain, repair and/or replace sediment tubes as required to maintain their effectiveness throughout the project

3.9 MAINTENANCE

A. Place all erosion control devices or measures prior to any land disturbing activity within the drainage area they are located.

B. Inspect erosion control devices and clean or otherwise remove silt buildup as necessary once a week or 24-hours following a rain event of $\geq$ 0.1".

3.10 REMOVAL

A. Remove temporary structures after protected areas have been stabilized.

3.11 MEASUREMENT AND PAYMENT

A. No separate measurement or direct payment will be made for the work under this

Section and all costs for same shall be included in lump sum for the items for which it pertains on the Bid Form.

END OF SECTION

SECTION 02510

STONE BASE COURSE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide crushed stone base (with prime) constructed on the compacted subgrade where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 02210 - Site Grading.
3. Section 02513 - Asphaltic Concrete Paving.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Certificates, signed by materials producer, stating that materials meet the specified requirements.

1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01640.

PART 2 - PRODUCTS

2.1 COARSE AGGREGATE

A. Furnish a coarse aggregate (retained on No. 4 sieve) consisting of hard, durable particles of stone, reasonably free from soft, thin, elongated or laminated pieces and deleterious substances.

B. Furnish aggregate with an abrasion loss of less than 65% as measured by the Los Angeles Abrasion Test.

2.2 FINE AGGREGATE

A. Furnish a fine aggregate consisting of material produced by stone crushing operations.

B. Liquid limit shall not exceed 25 and the plasticity index shall not exceed 6 when tested in accordance with AASH TO T-89 and T-90, respectively.

2.3 COMPOSITE MIXTURE

A. Produce in one crushing operation or by blending the fine and coarse aggregate in proper proportions.

B. After the materials have been mixed, laid down, and initial compaction operations begun, the composite mixture shall conform to the following:

Sieve Designation	Percent by Weight Passing
2"	100
1-1/2"	95-100
1"	70-100
1/2"	48-75
No. 4	30-50
No. 30	11-30
No. 200	0-12
Liquid Limit	25 max.
Plasticity Index	6 max.

2.4 PRIME ASPHALT

A. Use prime complying with requirements of South Carolina Department of Transportation *Standard Specifications for Highway Construction* subsections 305.4.6 Application of Prime Coat and Subsection 401.4.18 Application of Prime or Tack Coat, latest revisions and supplements.

B. Provide prime coat from a supplier listed on the most recent edition of SCDOT Qualified Product List 38.

PART 3 - EXECUTION

3.1 PREPARATION OF SUBGRADE

A. Proofroll all areas to receive crushed stone paving.

1. Make not less than three passes over the full area, using a 35 to 50 ton rubber tired roller.

B. Remove all soft, unstable or unsuitable material that will not compact readily.

1. Remove to full depth of unsuitable material, or to a depth of 30", whichever is less.
2. Replace with satisfactory materials.

C. Fill all holes, ruts or depressions which develop in the subgrade with approved on-site material, bringing subgrade to indicated line and grades.

D. Compact subgrade using suitable construction procedures to provide not less than 95% Standard Proctor Maximum Dry Density.

E. Seal roll the subgrade surface with a steel wheel roller, sealing the surface against excessive water infiltration.

3.2 PLACING AND MIXING OF PAVING MATERIAL

A. Place aggregates using spreader boxes or other approved spreaders uniformly on one operation.

B. Take care to avoid segregation of the fine from the coarse aggregate during handling, spreading or shaping operations.

C. Mix, while at proper moisture, with motor grader or other equipment and maintain to required section and grade until thoroughly compacted.

3.3 ROLLING AND COMPACTING

A. Perform using 3-wheel steel wheel roller weighing not less than 10 tons, tandem roller weighing at least 8 tons, or other rollers approved by the Engineer.

B. Start rolling at edges and proceed toward the center, continue rolling until aggregates are firmly keyed or set.

C. When initial compaction is completed, should voids remain, place fine aggregates on the surface in an amount only sufficient to fill the voids.

D. Broom, wet and roll until coarse aggregate is set, bonded and thoroughly compacted for full width and depth.

3.4 ALLOWABLE TOLERANCES

A. Thickness tolerance: Provide the compacted thicknesses shown on the Drawings within a tolerance of minus 1/2".

1. Depth measurements will be made by digging through the base at intervals no closer than 250', nor greater than 500' apart.
2. Where thickness is less than depth specified minus 1/2", it shall be corrected as directed by the Engineer.

B. Smoothness tolerance: Provide the lines and grades shown on the Drawings within a tolerance of 3/8" in 10', parallel to the center line of the roadway nor more than 1/2" from a template conforming to the cross sections shown on the plans.

C. Deviations: Correct by removing materials, replacing with new materials, and reworking or recompacting as required.

3.5 PLACING PRIME COAT

A. Allow base course to season sufficiently to permit uniform penetration.

B. Do not apply to wet surfaces or when the temperature is below 60ºF in the shade and falling, or below 55ºF in the shade and rising.

C. Clean surfaces of all dust, dirt, clay, etc. using mechanical brooms, etc.

D. Apply prime material, using pneumatic mounted distributors, at a rate of 0.25 to 0.30 gallon per square yard.

E. Permit no traffic on primed surfaces until bituminous material has penetrated and dried sufficiently that it does not pick up under traffic.

3.6 MEASUREMENT AND PAYMENT

A. No separate measurement or direct payment will be made for this work and all costs for same shall be included in the price bid for the work to which it pertains.

END OF SECTION

SECTION 02615

REMOVING AND REPLACING PAVEMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Removal and replacement of existing pavements for installation of utility lines, as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications.
2. Section 02221 - Trenching, Backfilling for Utilities.
3. Section 02721 - Sewers: Storm Drainage.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods for proper performance of the work of this Section.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01640.

1.5 WARRANTY

A. All remove and replace pavement work within the South Carolina Department of Transportation (SCDOT) rights-of-way shall be warranted for two years beginning on the date of acceptance by the SCDOT.

PART 2 - PRODUCTS

2.1 CONCRETE

A. Comply with Section 03300, using strength specified herein.

2.2 ASPHALTIC CONCRETE

A. Use Types 1 and 2 complying with South Carolina Department of Transportation Standard Specifications, Section 403 and latest revisions and supplements.

2.3 AGGREGATE BASE COURSE WITH PRIME

A. Comply with applicable portions of South Carolina Department of Transportation Standard Specifications, Section 305, Macadam Base Course, and latest revisions and supplements.

PART 3 - EXECUTION

3.1 GENERAL

A. Remove to neat lines and dispose of as directed.

B. Replace with bases and pavements similar to type removed, unless otherwise indicated.

3.2 CUTTING

A. Concrete pavement or base:

1. Cut on straight and true lines, to a minimum depth of 2", using powered concrete saw.
2. Shear off remaining depth with pneumatic tools.

B. Concrete sidewalks shall be removed back to the nearest joint on each side of the crossing.

C. Asphaltic concrete pavements: Cut to straight and true lines with powered concrete saw.

3.3 REPLACEMENT

A. Concrete pavements:

1. Use 4000 psi concrete.
2. Replace to 6" below existing slab and undercut each edge 6" to form shelf.
3. Finish surface to match existing surface.

B. Concrete sidewalks:

1. Replace with 4000 psi concrete.
2. Depth shall be equal to existing section removed, but not less than 4".
3. Finish surface to match existing sidewalk.

C. Flexible pavements (Ditch Line) – Secondary and Primary Roads:

1. Pavements to be replaced per details shown on plans.

D. Flexible pavements (Ditch Line) - Driveways:

1. Pavements to be replaced per details shown on plans.

E. Flexible pavements (Resurfacing):

1. In some instances where utilities are installed within existing pavements, resurfacing of the entire width of the original pavement will be required.
2. Replace pavement in ditch line as specified above.
3. Prime and resurface with 2" of asphaltic concrete.
4. Taper resurfacing to existing pavement evenly for a distance of 50 feet beyond repaired area.
5. Comply with Section 02513.

3.4 MEASUREMENT AND PAYMENT

A. Ditch line replacements: Payment will be made at the unit price per square yard as stated in the Bid Form.

END OF SECTION

SECTION 02721

SEWERS: STORM DRAINAGE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide storm drainage sewer as shown on the drawings, specified herein, and needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications.
2. Section 01050 - Field Engineering.
3. Section 02221 - Trenching, Backfilling for Utilities.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. All materials in this Section are to be manufactured in the United States.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01640.

1.5 ORDER AND ACCEPTANCE OF WORK

A. Engineer shall direct on what line or street the Contractor shall work and the order thereof.

1. Generally, work shall commence at the lower end of a system and proceed upgrade.

1.6 PROTECTION OF OTHER UTILITIES

A. Location:

1. Approximate location of certain known underground lines is shown.
2. Existing small lines not shown.
3. Locate small and other possible utility lines using electronic pipe finder, or other approved method.

4. Excavate and expose existing underground utilities ahead of trenching operations.

B. Repair or replace any damaged utility line or structure at no additional cost to Owner.

1.7 CONFLICTING UTILITIES

A. Remove and/or relay conflicting utilities, when so directed by the Engineer, at the expense of the Owner.

B. Where alterations to existing utilities are shown to avoid conflicts, make alterations at no cost to Owner.

PART 2 - PRODUCTS

2.1 GENERAL

A. Pipe shall be subject to Engineer's observation, at plant, trench or other point of delivery, for culling and rejecting pipe, independent of laboratory tests, not conforming to specifications.

B. Rejected pipe will be marked by the Engineer and Contractor shall remove it from project site.

2.2 PIPE AND MATERIALS

A. Reinforced concrete pipe (RCP):

1. Pipe to comply with ASTM C-76 for Class III, Wall B (unless higher class is indicated on the drawings).
2. Furnish pipe with joints designed for flexible watertight gaskets.
3. Provide integral bell and spigot or tongue and groove joints.
4. Provide gaskets on bell and spigot pipe:
   a. O-ring rubber complying with ASTM C-443; or
   b. Preformed plastic gaskets complying with AASHTO Designation M-198 for Type B, Flexible Plastic Gasket.
5. Provide butyl ribbon sealant conforming to ASTM C990 for tongue and groove pipe joints.

2.3 DRAINAGE STRUCTURES

A. Use precast concrete or built-in-place masonry units. Knockout boxes will not be accepted.

B. Precast drop inlets, catch basins, curb inlets, etc. shall be as manufactured by Knight’s Precast of Summerville, SC or equal units by others.

C. All other precast structures (i.e., headwalls, flared end sections, etc.) shall be approved by Engineer prior to installation.

D. Built-in-place structures:

1. Use concrete brick complying with ASTM C-55 for Grade N, Type II.
2. Use portland cement mortar: 1 part cement (ASTM C-150, Type I) to 3 parts clean, sharp sand.

E. Inlet Castings.

1. Provide gray iron castings, complying with ASTM A-48, Class 35B iron and AASHTO M-306.
2. Provide a minimum recycled material content of 75 consisting of post-consumer material.
3. Provide uniform quality, free from sand holes, gas holes, shrinkage, cracks and other surface defects.
4. Grind smooth and clean by shot blasting.
5. Cast or machine bearing surfaces between grates and frames with such precision to prevent rocking.
6. Casting dimensional tolerances shall be +/- 1/16” per foot.
7. All published casting weights may vary no more than +/- 5%.
8. Conduct a first article proof load test and provide the results of that proof load upon request.
    a. Conduct in accordance with the method and procedure that is outlined in AASHTO M-306.
    b. Test on a suitable and calibrated load testing machine. Casting shall hold a 40,000 pound proof load for one minute without experiencing any cracks or detrimental permanent deformation.
    c. Test results for each lot of castings be maintained Foundry to for a minimum of seven years. Make available upon request.
9. Inspect in accordance with AASHTO M-306.
10. Furnish a foundry certification stating that samples representing each lot have been tested, inspected, and are in accordance with this specification.
11. Each casting shall be identifiable and show, at a minimum, the following: name of the producing foundry, country of manufacture, ASTM material designation, recycle symbol, individual part number, cast or heat date.
12. Castings shall include all lettering as shown on the specification drawings.
13. Patterns and weights shall be as indicated on the Contract Drawings.
14. All castings are to be manufactured in the United States.

2.4 MANHOLES

A. Use precast manholes:

1. Provide reinforced precast concrete ring and eccentric cone sections complying with ASTM C-478 and the following.
2. Use portland cement complying with ASTM C-150, Type II.
3. Cast ladder rungs into the units.
4. Provide tongue and groove or o-ring rubber gasketed joints.
5. Use vulcanized butyl rubber sealant with tongue and groove joints.
6. Provide flat slab tops where manhole depth is less than 4'0".

B. Steps:

1. Provide polypropylene plastic steps reinforced with 3/8” diameter steel rod, M.S.A. Industries, Inc. Model PS-K, or equal.
2. Provide steps having non-skid top surfaces, safety slope at each end, minimum width of 10" and not less than 5" projection from wall.

C. Frames and covers:

1. Provide gray iron castings, complying with ASTM A 48, Class 35B iron and AASHTO M-306.
2. Provide a minimum recycled material content of 75 consisting of post-consumer material.
3. Castings shall be of uniform quality, free from sand holes, gas holes, shrinkage, cracks and other surface defects ground smooth and clean by shot blasting.

4. Cast or machine bearing surfaces between rings and covers with such precision to prevent rocking.
5. Casting dimensional tolerances shall be +/- 1/16” per foot.
6. Conduct a first article proof load test and make the results of that proof load available upon request.
    a. Conduct in accordance with the method and procedure outlined in AASHTO M-306.
    b. Test casting on a suitable and calibrated load testing machine. Casting shall hold a 40,000 pound proof load for one minute without experiencing any cracks or detrimental permanent deformation.
    c. Maintain test results for each lot of castings by the foundry for a minimum of seven years. Make available upon request.
7. Provide inspections in accordance with AASHTO M-306 and furnish results of these tests upon request.
8. Furnish a foundry certification stating that samples representing each lot have been tested, inspected, and are in accordance with this specification.
9. Each casting shall be identifiable and show, at a minimum, the following: name of the producing foundry, country of manufacturer, ASTM material designation, recycle symbol, individual part number, cast or heat date.
10. Provide frames and covers weighing not less than 285 lbs. with inside opening between 22" and 24".
11. Provide circular cover with two "pick" holes, one 1” diameter vent hole, and weighing not less than 130 lbs.
12. Covers to have the words "STORM SEWER" cast in the metal.
13. All castings are to be manufactured in the United States.
14. Provide East Jordan Iron Works, Inc. Model V-1384 or approved equal.

2.5 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

PART 3 - EXECUTION

3.1 LAYING OUT WORK

A. Provide all materials, labor, instruments, etc. required to lay out Work.

B. Prepare "cut sheets" under direct supervision of the Engineer.

C. Exercise proper precaution to verify figures on the drawings prior to laying out Work. Contractor will be held responsible for any errors therein that otherwise might have been avoided.

D. Promptly inform Engineer of errors or discrepancies found, in order that proper corrections may be made.

3.2 INSTALLATION

A. Trench, backfill and compact for the work of this Section in strict accordance with pertinent provisions of Section 02221 and Section 02615 of these specifications, and the following requirements:

1. Maximum trench widths, depths and bedding methods.
    a. Install all sewers complying with tables for depths of cut and class of bedding included hereinafter.

b. Where trenches are excavated beyond specified widths, or trench walls collapse, lay sewer complying with requirements of the next better class of bedding at no additional cost to the Owner.
c. Include cost of special bedding and tamping in unit prices bid for sewer.

2. Reinforced concrete pipe (RCP) - Class III:

MAXIMUM DEPTHS IN FEET					
		CLASS OF BEDDING			
		D	C	B	A
Pipe Size	Max. Trench Width	Flat Bottom Trench	Type 1 or Type 2	Special Earth Bedding	Special Concrete Bedding
12"	2'-6"	7.5	11.5	20	30
15"	2'-10"	7.0	11.0	15	30
18"	3'-2"	10.5	16.5	22.5	30
21"	3'-6"	9.0	14.0	22	30
24"	3'-10"	9.0	13.5	22	30
30"	4'-7"	10.0	14.5	20.5	30
36"	5'-5"	10.0	13.5	18	30
42"	6'-1"	11.0	14.5	19.5	30
48"	6'-6"	12.0	15.5	21	30

3. High density polyethylene pipe (HDPE) to be installed per ASTM D2321 and AASHTO Section 30 requirements.

4.

B. Bedding and tamping requirements for the various classes of bedding shall comply with the following specifications:

1. Class A Bedding - Excavate trench to one-fourth of nominal pipe diameter below pipe grade; lay pipe to grade on concrete blocking; place 2500 psi concrete around pipe for full width of trench up to one-fourth nominal pipe diameter above the invert.
2. Class B (Type 1) Bedding - Shape bottom of trench to a level two inches below bottom of pipe; bring bed to proper level by spreading and thoroughly tamping fine granulated moist earth and sand to conform accurately to one-fourth circumference of pipe barrel; provide suitable material if not available from trench excavation; lay pipe, backfill and hand tamp in thin layers to height three-fourths of pipe diameter, using material same as bedding material; complete trench backfill complying with Section 02221.
   a. Bring trenches excavated to excess depths to grade with stone or gravel bedding at the Contractor's expense.
   b. Exercise care to avoid disturbing pipe grade, alignment or joints at all times.
   c. In lieu of this class bedding, Contractor may elect to use Class B (Type 2) bedding.
3. Class B (Type 2) Bedding - Undercut 4" below pipe barrel, full width of trench; bring pipe to grade with crushed stone complying with SCDOT Aggregate No. 5; except for HDPE and PVC, use SCDOT Aggregate No. 57.
   a. For RCP pipe, place stone in 6" layers to mid-point of pipe, compacting by slicing with shovel.
   b. Complete trench backfill complying with Section 02221.
4. Class C (Type 1) bedding - Shape trench bottom by hand to conform accurately to bottom one-quarter of pipe barrel circumference.

a. Use Class C (Type 2) bedding if unable to properly shape trench bottom.
b. If shaping is not performed accurately, the Contractor will be required to use Class C (Type 2) bedding.

5. Class C (Type 2) Bedding - Undercut 4" below bottom of pipe barrel; full width of trench; bring pipe to grade with compacted crushed stone complying with SCDOT Aggregate No. 5; lay pipe; place stone in six-inch layers to quarter-point of pipe, compacting by slicing with shovel; complete backfill complying with Section 02221.
6. Class D Bedding:
   a. For RCP - Excavate bell holes in flat bottomed trench; lay pipe; backfill complying with Section 02221.
7. Where piping is installed under roadways, use controlled density fill for trench backfill to a distance of two (2) feet beyond edge of pavement.

C. Pipe laying:

1. General:
   a. Protect pipe during handling against shocks and free fall. Remove extraneous material from the pipe interior.
   b. Lay pipe by proceeding upgrade with the spigot ends of bell-and-spigot pipe pointing in direction of flow.
   c. Lay each pipe accurately to the indicated line and grade, aligning so the sewer has a uniform invert.
   d. Continually clear interior of the pipe free from foreign material.
   e. Before making pipe joints, clean and dry all surfaces of the pipe to be joined.
   f. Use gasket lubricants or joint primers as recommended by the pipe manufacturer.
   g. Place, fit, join and adjust the joints to obtain the degree of water tightness required.
2. Reinforced concrete pipe (RCP):
   a. Select proper bedding class from preceding table as determined by pipe size and depth of cut.
   b. Provide uniform and continuous support of pipe barrel between bell holes when utilizing Class D bedding.
   c. Joints:
      1) O-ring gaskets: Lubricate and install gaskets in accordance with manufacturer's recommendations.
         a) Align the pipe with previously installed pipe, and push the joint together. Using feeler gage, determine that gasket is properly fitted.
      2) Preformed plastic gaskets:
         a) Apply primer to clean, dry joint surfaces and allow to dry.
         b) Attach plastic strips end to end to the leading edge of the tongue, forming a continuous gasket around the entire circumference of the joint.
         c) Align pipe with previously laid joint and push the joint together. Sufficient pressure shall be applied to assure the joint is home and slight squeeze out of the gasket materials occurs.

3.3 MANHOLES AND PRECAST STRUCTURES

A. Set bases level so that walls will be plumb.

B. Apply joint sealer, or ring gasket to wall section(s), set firmly in place to assure watertight joints.

C. Form manhole invert channels directly in the concrete of the manhole base, with mortar, or by laying full section sewer pipe through the manhole and breaking out the top half after surrounding concrete has hardened. Smooth the floor of the manhole outside the channels, and slope toward the channels at not less than 1" per foot nor more than 2" per foot.

1. Shape the invert channels to be smooth and semicircular, conforming to the inside of the adjacent sewer section.
2. Make changes in direction of flow with a smooth curve of as large a radius as the size of the manhole will permit.
3. Make changes in size and grade of channels smoothly and evenly.
4. Slope invert uniformly from invert of inlet to invert of outlet.

3.4 BUILT-IN-PLACE STRUCTURES

A. Construct bottom of all structures using 3000 psi concrete complying with Section 03300, to dimensions indicated on the Contract Drawings.

B. Lay brick carefully embedded in mortar on bottom and ends.

C. Plaster outside of structures with a smooth coat of cement mortar.

D. Set frames and tops to grades indicated, mortar into place.

3.5 OBSERVATIONS

A. General:

1. Clean and prepare for observation each block or section of sewer upon completion, or at such other time as the Engineer may direct.
2. Each section between manholes shall show a full circle of light when viewed from either end.
3. Repair all visible leaks.
4. Correct broken or cracked pipe, mislaid pipe and other defects.
5. All repairs, relaying of sewers, etc. required to bring the sewers to specified status shall be made at no additional cost to the Owner.

B. Deflection tests:

1. Perform deflection tests on all PVC pipe in the presence of the Engineer.
2. No pipe to exceed a deflection of 5%.
3. Conduct deflection testing after the final backfill, and compaction thereof, has been in place at least thirty (30) days and prior to placing the sewer lines into operation.
4. Conduct the deflection tests using a rigid ball or mandrel having a diameter equal to 95% of the inside diameter of the pipe.
5. Do not use mechanical pulling devices for the deflection tests.

3.6 MEASUREMENT AND PAYMENT

A. All work under this Section will be measured and paid for as specified hereinafter.

B. Storm sewer pipe will be measured from center to center of structures and depth of cut from invert to original ground at centerline. Payment will be made at the unit prices per linear foot as stated in the Bid Form, and shall include cost of excavation, bedding, backfilling, clean-up, testing, etc.

C. Junction boxes, manholes, catch basins, etc. will be measured from the lowest invert elevation to the top rim of the frame and paid for at the unit price each as stated in the Bid Form, which shall include all costs of excavation, backfilling, materials, standard frame and cover, etc.

END OF SECTION

SECTION 02930

GRASSING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide grassing of the areas specified herein, or as indicated, for a complete and proper installation.

1. All areas disturbed by the construction operation.

B. Related work: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Seed: Conform to all State laws and to all requirements and regulations of the South Carolina Department of Agriculture.

1. Deliver to site each variety of seed individually packaged and tagged to show name, net weight, origin and lot number.

C. Fertilizer: Conform to State fertilizer law.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Complete materials list of items proposed to be provided under this Section.

1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01640.

B. At time of delivery, furnish the Engineer invoices of all materials received in order that application rates may be determined.

C. Immediately remove from the site materials that do not comply with the specified requirements, and promptly replace with materials meeting the specified requirements.

PART 2 - PRODUCTS

2.1 FERTILIZER

A. Provide commercial balanced 16-4-12 or 12-4-8 fertilizer delivered to the site in bags labeled with the manufacturer's guaranteed analysis.

2.2 GRASS SEED

A. Provide grass seed that is:

1. Free from noxious weed seeds, and recleaned.
2. Grade A recent crop seed.
3. Treated with appropriate fungicide at time of mixing.
4. Delivered to the site in sealed containers with dealer's guaranteed analysis.

2.3 LIME

A. Provide agricultural grade, standard ground limestone conforming to current "Rules, Regulations and Standards of the Fertilizer Board of Control" issued at Clemson University.

B. Bag tags or delivery slip for bulk loads shall indicate brand or trade name, calcium carbonate equivalent, and other pertinent data to identify the lime.

2.4 WOOD CELLULOSE FIBER

A. Provide wood chip particles manufactured particularly for discharging uniformly on the ground surface when dispersed by a hydraulic water sprayer.

B. Material to be heat processed so as to contain no germination or growth inhibiting factors.

C. It shall be dyed (non-toxic) an appropriate color to facilitate metering.

2.5 STRAW MULCH

A. Provide straw or hay material.

1. Straw to be stalks of wheat, rye, barley or oats.
2. Hay to be timothy, peavine, alfalfa, or coastal bermuda.

B. Material to be reasonably dry and reasonably free from mature seed bearing stalks, roots, or bulblets or Johnson Grass, Nutgrass, Wild Onion and other noxious weeds.

2.6 EXCELSIOR FIBER MULCH

A. To consist of 4" to 6", average length, wood fibers cut from sound, green timber.

B. Make cut in such a manner as to provide maximum strength of fiber, but at a slight angle to natural grain of the wood.

2.7 EROSION CONTROL BLANKET

A. Provide on areas as shown on the plans.

B. Provide Erosion Control Blanket S150, from North American Green, or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

A. Seed these areas immediately upon completion of grading or construction and clean-up operations.

1. Slopes greater than four horizontal to one vertical.
2. Utility rights-of-way adjacent to stream banks.

B. Areas ready for planting between August 16 and February 28 shall be planted with a temporary cover of Schedule No. 2. At the acceptable seasons for planting Schedule No. 1, the turf shall be destroyed by reworking the soil, and Schedule No. 1 seeding established as specified herein.

C. Use Rate A lbs. per 1000 sq. ft. on slopes over 5' horizontal to 1' vertical in height and use Rate B lbs. per 1000 sq. ft. on slopes less than 5' horizontal to 1' vertical.

3.2 SEEDING SCHEDULES

A. Mixtures of different types of seed for the various schedules shall be weighed and mixed in proper proportions in the presence of the Engineer.

B. Schedule No. 1 - Planting dates March 1 to August 15:

Common Name of Seed	**Rate A**	**Rate B**
Rye Grain	1	1
Common Bermuda (hulled)	0	1.5
Sericea Lespedeza (clay soils)	1	0
Weeping Love Grass (sandy soils)	1	0
Centipede	0.5	0.5

C. Schedule No. 2 - Planting dates August 16 - February 28:

Common Name of Seed	**Rate A**	**Rate B**
Rye Grain	0	1
Common Bermuda (hulled)	0	1.5
Brown Top Millet	5	0
Common Bermuda (unhulled)	0	2.0

3.3 GROUND PREPARATION

A. Bring all areas to proper line, grade and cross section indicated on the plans.

B. Repair erosion damage prior to commencing seeding operations.

C. Loosen seed bed to minimum depth of 3".

D. Remove all roots, clods, stones larger than 1" in any dimension, and other debris.

E. Conduct soil test to determine pH factor.

1. If pH is not in the range of 6.0 to 6.5, adjust.

3.4 APPLICATION OF FERTILIZER

A. Spread uniformly over areas to be seeded at:

1. Rate of 18 lbs. per 1000 sq. ft. when using 16-4-12.
2. Rate of 25 lbs. per 1000 sq. ft. when using 12-4-8.
3. Use approved mechanical spreaders.

B. Mix with soil to depth of approximately 3".

3.5 SOWING METHODS

A. General:

1. Perform seeding during the periods and at the rates specified in the seeding schedules.
2. Do not conduct seeding work when ground is frozen or excessively wet.
3. Produce satisfactory stand of grass regardless of period of the year the Work is performed.

B. Seeding, slopes less than four horizontal to one vertical:

1. Shall conform to Methods EA, WF or WCF as specified hereinafter.
2. Method EA (Emulsified Asphalt):
   a. Sow seed not more than 24 hours after application of fertilizer.
   b. Use mechanical seed drills on accessible areas, rotary hand seeders, power sprayers, etc. may be used on steep slopes or areas not accessible to seed drills.
   c. Cover seed and lightly compact with cultipacker if seed drill does not.
   d. Within 24 hours following compaction of seeded areas, uniformly apply 0.2 gallons per square yard of emulsified asphalt over the seeded area.
3. Method WF:
   a. Sow seed as specified for Method EA.
   b. Within 24 hours following covering of seeds, uniformly apply excelsior fiber at the rate of 100 lbs. per 1000 sq. ft.
   c. Apply material hydraulically.
   d. Seeded areas to be lightly rolled to form a tight mat of the excelsior fibers.
4. Method WCF:
   a. Apply seed, fertilizer and wood fiber mulch using hydraulic equipment.
   b. Equipment to have built-in agitation system with capacity to agitate, suspend and homogeneously mix a slurry of the specified amount of fiber, fertilizer, seed and water.
   c. Minimum capacity of slurry tank: 1000 gallons.
   d. Apply fiber mulch at rate of 35 lbs. per 1000 sq. ft.
   e. Regulate slurry mixture so that amounts and rates of application will result in uniform application of all materials at not less than the specified amounts.
   f. Apply slurry in a sweeping motion, in an arched stream, so as to fall like rain, allowing the wood fibers to build upon each other.
   g. Use color of wood pulp as guide, spraying the prepared seed bed until a uniform visible coat is obtained.

C. Seeding, slopes greater than four horizontal to one vertical:

1. Sow seed as specified for Method EA, unmulched.
2. Cover seeded area with erosion control blanket.

3.6 SECOND APPLICATION OF FERTILIZER

A. When plants are established and showing satisfactory growth, apply nitrogen at the rate of 1.0 lb. per 1000 sq. ft.

B. Apply in dry form unless otherwise directed by the Engineer.

C. Do not apply to stands of temporary grasses.

3.7 MAINTENANCE

A. Maintain all seeded areas in satisfactory condition until final acceptance of the Work.

B. Areas not showing satisfactory evidence of germination within six weeks of the seeding date shall be immediately reseeded, fertilized and/or mulched.

C. Repair any eroded areas.

D. Mow as necessary to maintain healthy growth rate until final acceptance of the Work.

3.8 ACCEPTANCE

A. Permanently seeded areas (Schedule No. 1) will be accepted when the grass attains a height of 2".

B. No acceptance will be made of temporary seeded areas (Schedule No. 2). Rework and seed with Schedule No. 1.

3.9 MEASUREMENT AND PAYMENT

A. No separate measurement or direct payment will be made for the work under this Section and all costs for same shall be included in lump sum for the items for which it pertains on the Bid Form.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide cast-in-place concrete, including formwork and reinforcement, where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 03250 - Concrete Specialty Items.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Reference standards: Comply with the following codes, specifications and standards, except as otherwise shown or specified:

1. American Concrete Institute (ACI) Publications:
   -- ACI 301 Specification for Structural Concrete for Buildings
   -- ACI 305 Recommended Practice for Hot Weather Concreting
   -- ACI 306 Recommended Practice for Cold Weather Concreting
   -- ACI 315 Manual of Standard Practice for Detailing Reinforced Concrete Structures
   -- ACI 318 Building Code Requirements for Reinforced Concrete
   -- ACI 347 Recommended Practice for Concrete Framework
2. American Society for Testing and Materials (ASTM) Publications:
   -- A185 Welded Steel Wire Fabric for Concrete Reinforcement
   -- A615 Deformed and Plain Billet Steel Bars for Concrete Reinforcement
   -- C31 Making and Curing Concrete Test Specimens in the Field
   -- C33 Concrete Aggregates
   -- C39-72 Compressive Strength of Cylindrical Concrete Specimens
   -- C94 Ready-Mixed Concrete
   -- C150 Portland Cement
   -- C260 Air-Entraining Admixtures for Concrete
3. Concrete Reinforcing Steel Institute (CRSI):
   -- "Manual of Standard Practice"
4. American Welding Society (AWS) Publication:
   -- D12.1-61 Welding Reinforcement Steel, Metal Inserts and Connections in Reinforced Concrete

C. Testing agency: A testing laboratory will be retained by the Owner to perform material evaluation tests required by these specifications.

D. Qualifications of contractors performing concrete work: Minimum of two (2) years experience on comparable concrete projects.

E. Plant qualification: Plant equipment and facilities shall meet all requirements of the Check List for Certification of Ready Mixed Concrete Production Facilities of the National Ready Mixed Concrete Association and ASTM C94.

1.3 SUBMITTALS

A. Comply with the pertinent provisions of Section 01340.

B. Within 30 calendar days after receiving the Owner's Notice to Proceed, submit proposed mix designs for approval.

1. Proportions shall be determined by means of laboratory tests of concrete made with the cement and aggregate proposed for use.
2. Provide report in detail from an approved testing laboratory showing 7-day and 28-day strengths obtained using materials proposed.
3. Required average strength above specified strength:
   a. Determinations of required average strength above specified strength (f'c) shall be in accordance with ACI 318 and ACI 301.
   b. Establish the required average strength of the design mix using the materials proposed to be employed. Standard deviations shall be determined by thirty tests. Average strength used for selecting proportions shall exceed specified strength (f'c) by at least:

400 psi	Standard deviation is less than 300
550 psi	Standard deviation is 300 to 400
700 psi	Standard deviation is 400 to 500
900 psi	Standard deviation is 500 to 600
1200 psi	Standard deviation is above 600 or unknown

   c. When the ready-mix producer does not have a record of past performance, the combination of materials and the proportions selected shall be selected from trial mixes having proportions and consistencies suitable for the work using at least three (3) different water/cement ratios which will produce a range of strengths encompassing those required. Average strength required shall be 1200 psi above specified strength.
4. Cost of this work shall be borne by the Contractor.

C. Manufacturer's data: Submit manufacturer's specification with application instructions for proprietary materials and items, including curing compound, form release agents, admixtures, patching compounds, and others as required by the Engineer.

D. Shop drawings: Submit the following shop drawings to the Engineer for approval before work is started:

1. Reinforcing steel drawings: Prepare in accordance with ACI 315. Indicate bending diagrams, assembly diagrams, splicing and laps of bars, dimensions and details of bar reinforcing and accessories.
2. Cementitious coating.

1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01640.

B. Store reinforcement in a manner that will avoid excessive rusting or coating by grease, oil, dirt and other objectionable materials.

C. Keep reinforcement in separate piles or racks so as to avoid loss of identification after bundles are broken.

PART 2 - PRODUCTS

2.1 FORMS

A. Use form materials conforming to ACI 347.

B. Form lumber: Use lumber of sufficient quality and grade, size and stiffness to adequately support the work and ensure dimensional accuracy.

C. Form ties: Use form ties which do not leave an open hole through the concrete and which permit neat and solid patching at every hole.

1. Use ties with cones that allow a 1" break back and facilitate patching.
2. On structures containing water or other liquid or below grade structures, use embedded rod ties with integral waterstops in addition to cones.
3. Through-bolts that utilize a removable tapered sleeve in water containing and below grade applications: Use mechanical EPDM rubber plugs to seal holes made after removal of taper ties. Acceptable product is X-Plug by the Greenstreak Group, Inc. 800-325-9504. Follow manufacturers' instructions for installation. Friction fit plugs are not allowed.
4. Wire ties and wood spreaders will not be permitted.

D. Form coatings: Form release coating shall be neat oil with surface wetting agent or chemical release agent which effectively prevents absorption of moisture, prevents bonding with concrete, is non-staining to concrete and leaves the concrete with a paintable surface.

1. On surfaces to receive an applied coating, use a residual free chemical form release agent which is compatible with the applied coating and will not prevent the applied finish from satisfactorily bonding to the concrete.

E. Chamfer strips: Chamfer strips shall be wood or polyvinyl strips or approved equal, designed to be nailed in the forms to provide a 3/4" chamfer (unless indicated otherwise) at all exposed edges and corners of concrete members.

2.2 REINFORCEMENT

A. Comply with the following as minimums:

1. Bars: ASTM A615, Grade 60, unless otherwise shown on the Drawings, using deformed bars for Number 3 and larger.
2. Welded wire fabric: ASTM A185.
   a. Use sheet (mat) welded wire fabric only.
   b. Welded wire fabric supplied in rolls will not be accepted.
3. Bending: ACI 315 and ACI 318.

B. Fabricate reinforcement to the required shapes and dimensions, within fabrication tolerances stated in the CRSI "Manual of Standard Practices".

C. Do not use reinforcement having any of the following defects:

1. Bar lengths, depths, or bends exceeding the specified fabricating tolerances.
2. Bends or kinks not indicated on the Drawings or required for this Work.
3. Bars with excessive rust, scale, dirt, oil or other defects which will reduce the bond or the effective cross section of the bar.

D. Furnish all support bars, tie bars, chairs, bolsters, etc. required for properly supporting and spacing bars in the forms.

1. For slabs on grade, use supports with stand plates or horizontal runners where wetted base materials will not support chair legs. Other supports must be approved by the Engineer.
2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are hot-dip galvanized, plastic protected or stainless steel.
3. Supply supports for welded wire fabric as follows:

Welded Wire Fabric Support Spacing

Welded Wire Reinforcement (diameter)	Welded Wire Spacing (inches)	Maximum Support Spacing (feet)
W9 or larger	12 and greater	4
W5 to W8	12 and greater	3
W9 and larger	Less than 12	3
W4 to W8	Less than 12	2
Less than W4	Less than 12	1.5

E. Tie wire: FS QQ-W-461, annealed steel, black, 16 gauge minimum.

F. Welding electrodes: AWS A5.1, low hydrogen, E70 series.

G. Splice devices: Shall be sized to develop one hundred twenty-five (125%) percent of yield strength of bar.

2.3 CONCRETE MATERIALS

A. Cement: Use portland cement: ASTM C150, Type I, Type I-P or Type II, low alkali.

1. Where concrete will be exposed to sewage, use Type II or I-P cement.
2. Fly ash shall conform to ASTM C618, Class C or F.
3. Fly ash content shall not exceed 20% by weight of the total amount of cementitious materials (portland cement plus fly ash).

B. Aggregates:

1. Fine aggregate: Conform to ASTM C33.
2. Coarse aggregate: Conform to ASTM C33, Size #57.

C. Water: Clean and potable and free from injurious amounts of deleterious materials.

D. Admixtures:

1. Air entraining admixture: ASTM C260.
2. Water reducing, set controlling admixture: Conform to ASTM C494.

a. Type A - water reducing.
b. Type D - water reducing and retarding.

3. Superplasticizers: Conform to ASTM C494, Types F and G.
   a. Use superplasticizers in thin section placements and in areas of congested reinforcing and/or embedded items, or where otherwise approved by the Engineer.
   b. Use where conventional consolidation techniques are impractical.
4. Do not use admixtures containing calcium chloride.

E. Fiber reinforcing:

1. Use fiber reinforcing where indicated on the drawings.
2. Provide polypropylene or co-polymer fibers as manufactured by High Tech Fibers, Inc., Fibermesh Company or an approved equal.
3. Where required, use fiber reinforcing at a rate of 2.0 lbs. per cubic yard unless another rate is indicated on the drawings.

F. Curing compounds:

1. On all vertical and formed surfaces, construction joints, basin slabs, surfaces to receive an applied coating or finish, and other surfaces except as otherwise indicated or specified, use a non-residual, non-staining curing compound conforming to ASTM C309 Type 1 and 1D. Acceptable products are:
   a. L&M Cure by L&M Construction Chemicals, Inc.
   b. Horn WB-75 by A.C. Horn Company.
   c. Sonosil by Sonneborn, Inc.
   d. Approved equal.
2. On building floor slabs not otherwise receiving an applied coating or finish and on other flatwork as indicated on the Drawings, provide an acrylic copolymer curing and sealing compound conforming to ASTM C309 Type 1 and the following:
   a. Non-yellowing.
   b. Minimum 20% solids.
   c. Maximum unit moisture loss in accordance with ASTM C156 - 0.40 kg./sq.m at 72 hours.
   d. Acceptable products are Dress & Seal by L&M Construction Chemicals, Inc., Clear Seal Standard by A. C. Horn Company, Kure-N-Seal 0800 by Sonneborn, Inc., or approved equal.

2.4 CONCRETE MIXES

A. Provide concrete with the compressive strengths shown on the Drawings. When such strengths are not shown on the Drawings, provide the following 28-day strengths as minimum:

1.	All structural concrete except as indicated in Nos. 2 and 3 below or as noted otherwise on the plans	4000 psi
2.	All sidewalks, curbs and gutters, and unreinforced foundations	4000 psi with fiber reinforcing
3.	Thrust blocking, backfill or encasement for piping, and concrete fill	2500 psi
4.	Prestressed or precast concrete:	5000 psi

B. Maximum water cement ratios:

4000 psi concrete	0.45
3000 psi concrete	0.53

2500 psi concrete 0.67

C. Entrained air:

3000 and 4000 psi concrete	5% ± 1%
2500 psi concrete	Not Required

D. Slump:

3000 and 4000 psi concrete	4" ± 1"
2500 psi concrete	5" ± 1"

E. Production of concrete:

1. General: Concrete shall be ready mixed and shall be batched, mixed and transported in accordance with ASTM C94 except as otherwise indicated.
2. Monitor time and mix proportions by plant delivery slips.
3. Air entraining admixtures: Add air entraining admixture into the mixture as a solution and measure by means of an approved mechanical dispensing device.
4. Water reducing and retarding admixture: Add water reducing and retarding admixture and measure as recommended by the manufacturer.
5. Addition of water to the mix upon arrival at the job site shall not exceed that necessary to compensate for a 1" loss in slump, nor shall the design maximum water-cement ratio be exceeded. Water shall not be added to the batch at any later time.
6. Weather conditions: Control temperature of mix as required by ACI 306 "Cold Weather Concreting" and by ACI 305 "Hot Weather Concreting".

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Water, mud, organic, and other detrimental material shall be removed from excavations before concrete is deposited.

C. Notify the Engineer prior to placing concrete and place no concrete until the formwork, reinforcing and embedded items have been observed by the Engineer.

3.2 FORMWORK

A. General:

1. Construct forms in conformance with ACI 347.
2. Design, erect, support, brace and maintain formwork so it will safely support vertical and lateral loads which might be applied until such loads can be supported safely by the concrete structure.
3. Construct forms to the exact sizes, shapes, lines and dimensions shown, and as required to obtain accurate alignment, location, grades, level and plumb work in the finished structure.
4. Provide formwork sufficiently tight to prevent leakage of cement paste during concrete placement. Solidly butt joints and provide backup material at joints as required to prevent leakage and prevent fins.

B. Form construction and erection:

1. Construct forms in conformance with ACI 347.
2. Provide for openings, offsets, keyways, recesses, moldings, reglets, chamfers, blocking, screeds, bulkheads, anchorages, inserts and other embedded items as required.
3. Hold inner and outer forms for vertical concrete together with combination steel ties and spreaders approved by the Engineer.
4. Unless specifically stated otherwise, provide 3/4" chamfer at all exposed edges of concrete.
5. Provide temporary openings in the formwork where necessary to facilitate cleaning and inspection of the formwork.
6. Coat form contact surfaces with approved form coating compound prior to placing reinforcing steel.
7. Do not allow excess form coating material to accumulate in the forms or to come in contact with reinforcing surfaces which will bond to fresh concrete.
8. Side forms for footings may be omitted, and concrete may be placed directly against excavation only when requested by the Contractor and approved by the Engineer.
9. Provide a positive means of adjustment of shores and struts and ensure that all settlement is taken up during concrete placing.
10. Construct blockouts and formed openings of sufficient size and proper location to permit final alignment of items within it or passing through it.
    a. Allow sufficient space for grouting, packing or sealing around any items penetrating the opening as may be required to ensure watertightness.
    b. Provide openings with continuous keyways with waterstops where required, and provide a slight flare to facilitate grouting and the escape of entrapped air during grouting.
    c. Provide only blockouts or openings that are shown on the drawings or otherwise approved by the Engineer.

C. Formwork reuse: Reuse only forms that are in good condition and which maintain a uniform surface texture on expose concrete surfaces.

1. Apply a light sanding as necessary to obtain a uniform texture.
2. Plug unused tie holes and penetrations flush with the form surface.

D. Removal of forms:

1. Do not disturb or remove forms until the concrete has hardened sufficiently to permit form removal with complete safety. Do not remove shoring until the member has acquired sufficient strength to support its own weight, the load upon it, and the added load of construction.
2. Do not remove forms before the following minimum times without prior approval from the Engineer:
    a. Sides of footings or slabs on grade 24 hrs
    b. Walls not supporting load 48 hrs
    c. Vertical sides of beams 48 hrs
    d. Columns not supporting load 48 hrs
    e. Suspended slabs or beam bottoms (forms only) 10 days
3. In determining the minimum stripping times, consider only the cumulative time during which the ambient temperature of the air surrounding the concrete is above 50º.
4. Do not remove shoring for suspended slabs or beams until the concrete has reached 75% of the specified 28 day strength.

5. When reshoring or backshoring is permitted or required, plan the operations in advance and submit procedures to the Engineer for approval.
   a. Design and plan all reshoring operations to support all construction loading and in accordance with ACI 347.
6. Exercise care in removing forms from finished concrete surfaces so that surfaces are not marred or gouged and that corners are true, sharp and unbroken.
7. Do not permit steel spreaders, form ties, or other metal to project from or be visible on any concrete surface except where so shown on the drawings.
8. Whenever the formwork is removed during the curing period, continue to cure the exposed concrete by one of the methods specified herein.

3.3 EMBEDDED ITEMS

A. Embedded items: Set anchor bolts and other embedded items accurately and securely in position in the forms until the concrete is placed and set.

1. Use templates where practical for all anchor bolts.
2. Check locations of all anchor bolt and special castings prior to placing concrete and verify locations after concreting.

B. Piping cast in concrete:

1. Install and secure sleeves, wall pipes and pipe penetrations before placing concrete.
2. Do not weld or otherwise attach piping to reinforcing steel.
3. Support piping to be encased in concrete securely and on firm foundation so as to prevent movement or settlement during concreting.

C. Locate electrical conduit so that it will not impair the strength of the construction.

1. Do not use conduits running within (not passing through) a slab, wall or beam that are larger in outside diameter than 1/3 overall concrete thickness unless otherwise approved by the Engineer.
2. Do not space conduits closer than three conduit diameters apart unless otherwise approved by the Engineer.

3.4 REINFORCEMENT

A. General: Comply with the specified codes and standards and Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars" for details and methods of reinforcement placement and supports and as herein specified.

1. Clean reinforcement and remove loose dust and mill scale, earth, and other materials which reduce or destroy bond with concrete.
2. Position and secure reinforcement against displacement by forms, construction, and the concrete placement operations.
3. Use adequate number of ties to secure reinforcing.
4. Do not weld or field bend reinforcing without prior approval by the Engineer.

B. Placing reinforcing:

1. Provide and install all chairs, runners, bolsters, standees and other accessories in sufficient quantities to satisfactorily position the reinforcing and hold it in place during concrete placement.

2. Support reinforcing for slabs on ground on chairs or bolsters with stand plates or a properly sized concrete cube.
   a. Use concrete bricks as supports only as approved by the Engineer.
3. Secure and tie dowels in place prior to placing concrete. Do not press dowels into wet concrete.

C. Concrete cover: Unless otherwise indicated on the drawings or specified herein, install reinforcing with clear concrete coverage in conformance with ACI 318.

1. All reinforcement, regardless of size, exposed to water or sewage shall have 2" cover.
2. Place reinforcement a minimum of 2" clear of any openings or metal pipe or fittings.

D. Splicing reinforcement: Splice reinforcement steel in accordance with the latest revisions of ACI 318 "Building Code Requirements for Reinforced Concrete" unless shown otherwise on the drawings.

1. All splices at wall corners or intersections and at wall and foundation intersections shall be Class B tension splices per ACI 3-18, Sections 12.2.2 and 12.15.
2. All other splices of vertical or horizontal steel in walls shall be Class B tension splices as per ACI 318 per ACI 318, Sections 12.2.2 and 12.15.
3. Horizontal ring steel in circular, non-prestressed concrete tanks shall be Class B tension splices and the splices shall be staggered so that no more than 50% of the bars are spliced at any one location.
4. All welded or mechanical splicing devices shall develop 125% of the yield strength of the bar.
5. Column vertical bars shall lap 30 bar diameters with dowels at the base of the column unless otherwise noted. Dowels shall be the same size and quantity as column vertical bars unless otherwise noted.
6. All splices not otherwise shown or specified shall be Class B tension lap splices per ACI 318, Sections 12.2.2 and 12.15.

E. Tolerances: Place bars in the locations indicated within the tolerances conforming to the CRSI "Manual of Standard Practice".

F. Welded wire mesh: Install welded wire fabric in as long of a length as practicable and lay flat before placing concrete.

1. Use only mat welded wire fabric. Do not use welded wire fabric from rolls.
2. Support and tie mesh to prevent movement during concrete placement.
3. Lap adjoining pieces at least one full mesh and lace splices with wire.
4. Provide, at a minimum, supports for welded wire fabric according to the Table in Section 2.2.D.3. Confirm the adequacy of the support spacings listed therein for the anticipated construction loads. Increase the number of supports, if necessary, to assure that the final position of the welded wire fabric will conform to that shown on the drawings.
5. Do not place welded wire fabric on the subbase surface and then hook or "pull up" the reinforcement during concrete placement.
6. Do not lay welded wire fabric on top of the freshly placed concrete and then "walk it" into place.

3.5 PLACING CONCRETE

A. Preparation:

1. Remove foreign matter accumulated in the forms.
2. Rigidly close openings left in the formwork.

3. Wet wood forms sufficiently to tighten up cracks. Wet other material sufficiently to maintain workability of the concrete.
4. Use only clean tools.
5. Provide and maintain sufficient tools and equipment on hand to facilitate uninterrupted placement of the concrete.
6. Before commencing concrete, inspect and complete installation of formwork, reinforcing steel and all items to be embedded or cast-in.

B. Conveying:

1. Transport and handle concrete from the truck to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of ingredients to maintain the quality of the concrete.
2. Provide equipment for lifting, dumping, chuting, pumping or conveying the concrete, of such size and design as to ensure a practically continuous flow of concrete at the delivery and without separation of materials.
3. Use hopers and elephant trunks where necessary to prevent the free fall of concrete for more than 4'.
4. Do not use concrete that is not placed within 1-1/2 hours after water is first introduced into the mix unless the slump is such that it meets the specified limits without the addition of water to the batch.

C. Placing:

1. Deposit concrete as nearly as practicable in its final location so as to avoid separation due to rehandling and flowing.
2. Deposit concrete in horizontal layers not deeper than 2', avoiding inclined layers.
3. Place concrete at such a manner that concrete upon which fresh concrete is deposited is still plastic.
4. Bring slab surfaces to the correct level with screeds set to the proper elevation.

D. Hot weather placement: Place concrete in hot weather in accordance with ACI 305 "Hot Weather Concreting" and as specified herein.

1. Do not place concrete whose temperature exceeds 100ºF.
2. Thoroughly wet forms and reinforcing prior to placement of concrete.
3. Use additional set retarder as necessary to increase set time.
4. Limit the size of the pour where it may reduce the likelihood of cold joints due to reduced set time.
5. Shade the fresh concrete as soon as possible after placing.
6. Start curing as soon as the concrete is sufficiently hard to permit without damage.

E. Cold weather placement: Place concrete in cold weather in accordance with ACI 306 and as specified herein.

1. Except when authorized specifically by the Engineer, do not place concrete when the atmospheric temperature is below 40ºF.
2. When cold weather placement is approved by the Engineer, heat either the mixing water or aggregate or both so that the concrete temperature is between 65ºF and 85ºF.
3. Protect the freshly placed concrete by adequate housing or covering and provide heat to maintain a temperature of not less than 50ºF for not less than four days.
4. Do not add salts, chemicals, or other materials to the concrete mix to lower the freezing point of the concrete.

F. Consolidation:

1. Consolidate each layer of concrete immediately after placing, by use of internal concrete vibrators supplemented by hand spading, rodding, or tamping.
   a. Use vibrators having a 2" head diameter and a minimum frequency of 8000 vibrations per second.
   b. Provide sufficient number of vibrators to properly consolidate the concrete, keeping up with placement operations.
   c. Provide at least one spare vibrator on site.
2. Insert and withdraw vibrators at points approximately 18" apart.
3. Do not vibrate forms or reinforcement.
4. Do not use vibrators to transport concrete inside the forms.

3.6 PROTECTION

A. Protect the surface finish of newly placed concrete from damage by rainwater or construction traffic.

B. Do not apply design loads to structures until the concrete has obtained the specified strength.

1. Do not backfill against walls until they have reached the specified strength and all supporting or bracing walls, slabs, etc. have also reached the specified strength, unless otherwise permitted by the Engineer.
2. Protect structures from construction overloads.

3.7 CURING

A. Beginning immediately after placement, protect concrete from premature drying, excessively hot and cold temperatures and mechanical injury.

B. Continuously cure concrete for a period of not less than 7 days after placement.

1. When seven-day cylinder breaks indicate, in the opinion of the Engineer, the possibility of low strength concrete, provide additional curing as per the request of the Engineer.
2. When temperatures during the curing period fall below 40ºF, provide additional curing time as directed by the Engineer.

C. Unless otherwise directed by the Engineer, cure concrete not in contact with forms in accordance with one of the following procedures:

1. Ponding or sprinkling: Keep entire concrete surface wet by continuously sprinkling or by allowing water to pond, covering all surfaces.
2. Wet burlap: Thoroughly wet and cover all concrete surfaces with wet burlap mats as soon as the concrete has set sufficiently to avoid marring the surface.
   a. Keep the burlap continuously wet during the curing period.
3. Curing blankets: Thoroughly wet concrete surfaces to be cured and cover with curing blankets as soon as the concrete has set sufficiently to avoid marring the surface.
   a. Weight the blankets down to maintain close contact with the concrete surface.
   b. Use sheets of waterproof kraft paper with the joints between sheets taped continuously; or
   c. Use sheets of 4 mil or thicker polyethylene with the joints between sheets continuously taped.

4. Wet sand: Apply a layer of sand over the entire surface and keep it continuously wet.
5. Curing compound: Apply curing compound immediately after completion of the finish on uniformed surfaces and within two hours after removal of forms on formed surfaces.
   a. Spray the entire surface with two coats of liquid curing compound, applying the second coat in the direction of 90º to the first coat.
   b. Apply compound in accordance with the manufacturer's instructions to cover the surface with a uniform film which will seal thoroughly.

D. Hot weather: When necessary, provide wind breaks, shading, fog spraying, sprinkling, ponding or wet covering with a light colored material applying as quickly as concrete hardening and finishing operations will allow.

3.8 CONCRETE FINISHING

A. Finish schedule: Unless otherwise indicated on the drawings, finish all concrete surfaces in accordance with the following schedule:

1. Form finish: Formed surfaces not ordinarily exposed to view, including:
   a. Interior walls of open tanks below a line one foot lower than the lowest normal water level.
   b. The underside of slabs not exposed to view.
   c. Walls below grade.
2. Cementitious coating: All formed surfaces exposed to view including:
   a. Interior walls of tanks above a line one foot lower than the lowest normal water level.
   b. The underside of slabs, soffits, etc. exposed to view.
3. Float finish: Slab surfaces not exposed to view or not receiving an applied thin finish, including:
   a. Bottom slabs of tanks or structures containing water sewage or other liquid.
   b. Foundations not exposed to view.
   c. Roof slabs to be covered with insulation and/or built-up roofing.
4. Trowel finish: Interior slab surfaces exposed to view or to receive an applied thin film coating or floor finish, including:
   a. Interior, indoor slabs and floors of buildings.
   b. Surfaces on which mechanical equipment moves.
   c. Floors receiving vinyl tile, resilient flooring, carpet, paint, etc.
5. Broom finish: Exterior, outdoor slabs exposed to view including:
   a. Outdoor floor slabs and walkways.
   b. Other floors which may become wet or otherwise require a non-skid surface.
   c. Sidewalks and concrete pavements.
6. Scratch finish: Surfaces which are to receive a thick topping or additional concrete cast against them including:
   a. Surfaces receiving concrete equipment pads.
   b. Floors receiving concrete topping.
   c. Construction joints not otherwise keyed.
7. Edge finish: Exposed edges of slabs not receiving chamfer including:
   a. Sidewalk edges and joints.
   b. Pavement edges and joints.
   c. Other slab edges not chamfered.

B. Finishing procedures:

1. Form finish:
   a. Repair defective concrete.
   b. Fill depressions deeper than 1/4".

c. Fill tie holes.
d. Remove fins exceeding 1/8" in height.

2. Cementitious finish:
   a. Patch all tie holes and defects and remove all fins.
   b. Within one day of form removal, fill all bug holes, wet the surfaces and rub with carborundum brick until a uniform color and texture are produced; or
   c. Dampen surfaces, brush apply a grout slurry consisting of 1 part portland cement to 1-1/2 parts sand, and rub the surface vigorously with a stone. Remove all excess grout.
   d. Provide a two coat cement base waterproofing, sealing finish of Thoroseal and Thoroseal Plaster Mix as manufactured by Standard Dry Wall Products, Inc. or an approved equal.
      1) Patch all tie holes and defects and removal all fins, and clean surface of all dirt, laitance, grease, form treatments, curing compounds, etc.
      2) Key coat: Apply key coat of Thoroseal at a rate of two (2) lbs. per sq. yd. by fiber brush. Mix material using one part of Acryl 60 to three parts clean water. Should material start to drag during application, dampen surface with water. During hot weather periods, dampen surfaces with water prior to application of key coat material. Key coat shall be allowed to cure for five (5) days before applying finish coat.
      3) Apply a finish coat consisting of a four (4) to six (6) lbs. per sq. yd. application of Thoroseal Plaster Mix using steel trowel or spray gun. Color to be selected by the Owner. Mix dry material using one (1) part Acryl 60 to three (3) parts clean water. Firmly press the mix into all voids and level with a steel trowel. When surface is set so that it will not roll or lift, float it uniformly using a sponge float.

3. Float finish:
   a. Begin floating when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation.
   b. Cut down all high spots and fill all low spots and float the slab to a uniform sandy texture.

4. Trowel finish:
   a. Float finish as specified herein.
   b. Power trowel to a smooth surface free of defects.
   c. After the surface has hardened sufficiently, hand trowel until a ringing sound is produced as the trowel is moved over the concrete surface.

5. Broom finish:
   a. Float finish as specified herein.
   b. Provide a scored texture by drawing a broom across the surface.

6. Scratch surface:
   a. Screed the surface to the proper elevations.
   b. Roughen with rakes or stiff brushes.

7. Edge finish: Tool slab edges and joints with a 1/4" radius edging tool.

3.9 SURFACE REPAIR

A. Patching mortar:

1. Make a patching mortar consisting of 1 part portland cement to 2-1/2 parts sand by damp loose volume.
2. Mix the mortar using one part acrylic bonding admixture to two parts water.

B. Tie holes: Clean and dampen all tie holes and fill solidly with patching mortar.

C. Surface defects:

1. Remove all defective concrete down to sound solid concrete.
2. Chip edges perpendicular to the concrete surface or slightly undercut, allowing no feather edges.
3. Dampen surfaces to be patched.
4. Patch defects by filling solidly with repair mortar.

D. Allow the Engineer to observe the work before placing the patching mortar.

E. Repair defective areas greater than 1 sq. ft. or deeper than 1-1/2" as directed by the Engineer using materials approved by the Engineer at no additional expense to the Owner.

3.10 JOINTS

A. Construction joints:

1. Unless otherwise approved by the Engineer, provide construction joints as shown on the drawings.
2. If additional construction joints are found to be required, secure the Engineer's approval of joint design and location prior to start of concrete placement.
3. Continue all reinforcing across construction joints and provide 1-1/2" deep keyways unless indicated otherwise on the drawings.
   a. Form keyways in place.
4. Provide waterstops in all construction joints of liquid containing structures, structures below grade or other structures as shown on the drawings.

B. Expansion joints:

1. Provide expansion joints of size, type and locations as shown on the drawings.
2. Do not permit reinforcement or other embedded metal items that are being bonded with concrete (except smooth dowels bonded on only one side of the joints, where indicated on the drawings) to extend continuously through any expansion joint.
3. Provide waterstops where required.

C. Control or contraction joints:

1. Locate and construct control and contraction joints in accordance with the Drawings.
2. Where no specific joint pattern is indicated in slabs on grade or concrete pavements, submit a proposed joint layout to the Engineer for approval.
3. Where no specific joint details are shown on the drawings, joints may be tooled, preformed or saw-cut.
4. Saw-cut joints as soon as the concrete has hardened sufficiently to prevent aggregates from being dislodged by the saw.

3.11 FIELD QUALITY CONTROL

A. Concrete cylinder tests:

1. During construction, prepare test cylinders for compressive strength testing, using 6" diameter by 12" long single use molds, complying with ASTM C31.

a. Make a set of three test cylinders from each pour of 50 cubic yards or less, plus one additional set of cylinders for each additional 50 cubic yards or fraction thereof.
b. Identify each and tag cylinder as to date of pour and location of concrete which it represents.
c. Deliver cylinders to testing lab selected by the Owner.
d. Cost for preparation and delivery of cylinders shall be borne by the Contractor. Cost for testing cylinders will be borne by the Owner.

2. Should strengths shown by test cylinders fail to meet specified strengths for the concrete represented, then:
a. Engineer shall have the right to require changes in the mix proportions as he deems necessary on the remainder of the work.
b. Additional curing of those portions of the structure represented by the failed test cylinders shall be accomplished as directed by the Engineer.
c. Upon failure of the additional curing to bring the concrete up to specified strength requirements, strengthening or replacement of those portions of the structure shall be as directed by the Engineer.
d. The Engineer may require additional testing of concrete in question by either non-destructive methods such as the Swiss Hammer, Windsor Probe or Ultrasonics or by coring and testing the concrete in question in accordance with ASTM C42. Such testing shall be performed at no additional cost to the Owner.

B. Other field concrete tests:

1. Slump tests: Either the Engineer or a testing laboratory representative will make slump tests of concrete as it is discharged from the mixer.
a. Slump test may be made on any concrete batch at the discretion of the Engineer.
b. Failure to meet specified slump requirements (prior to addition of any superplasticizers) will be cause for rejection of the concrete.
2. Temperature: The concrete temperature may be checked at the discretion of the Engineer.
3. Entrained air: Air content of the concrete will be checked by a representative of the testing laboratory at the discretion of the Engineer.

C. Coordination of laboratory services: The Contractor shall be responsible for coordination of laboratory services.

1. Maintain a log recording quantities of each type of concrete placed, date and location of pour.
2. Inform the testing laboratory of locations and dates of concrete placement and other information as required to be identified in the laboratory's test reports.

D. Tests required because of extensive honeycombing, poor consolidation of the concrete or any suspected deficiency in the concrete will be paid for by the Contractor.

E. Dimensional tolerances:

1. Dimensional tolerances for allowable variations from dimensions or locations of concrete work, including the locations of embedded items shall be as given in ACI 301.
2. Where anchor bolts or other embedded items are required for equipment installation, comply with the manufacturer's tolerances if more stringent than those stated in ACI 301.

F. Watertight concrete:

1. All liquid containing structures, basements or pits below grade shall be watertight.
2. Any visible leakage or seepage shall be repaired as instructed by the Engineer at no expense to the Owner.
3. Where physical evidence of honeycombing, cold joints or other deficiencies which may impair the watertightness of a structure exists, the Engineer may at his discretion call for leak testing of the structure.
   a. Fill the structure with water and allow to stand for not less than 48 hours.
   b. Make repairs on the structure until all visible leaks are sealed and the leakage rate of the water in the structure is less than 0.1% of the volume held in the structure per day.
   c. The cost of testing and repairs shall be performed at no expense to the Owner.

G. Concrete which fails to meet strength requirements, dimensional tolerances, watertightness criteria, or is otherwise deficient due to insufficient curing, improper consolidation or physical damage shall be replaced or repaired as instructed by the Engineer at no expense to the Owner.

3.12 MEASUREMENT AND PAYMENT

A. No measurement or direct payment will be made for the work under this Section and all costs for same shall be included in the price bid for the item in which the concrete work is an integral part.

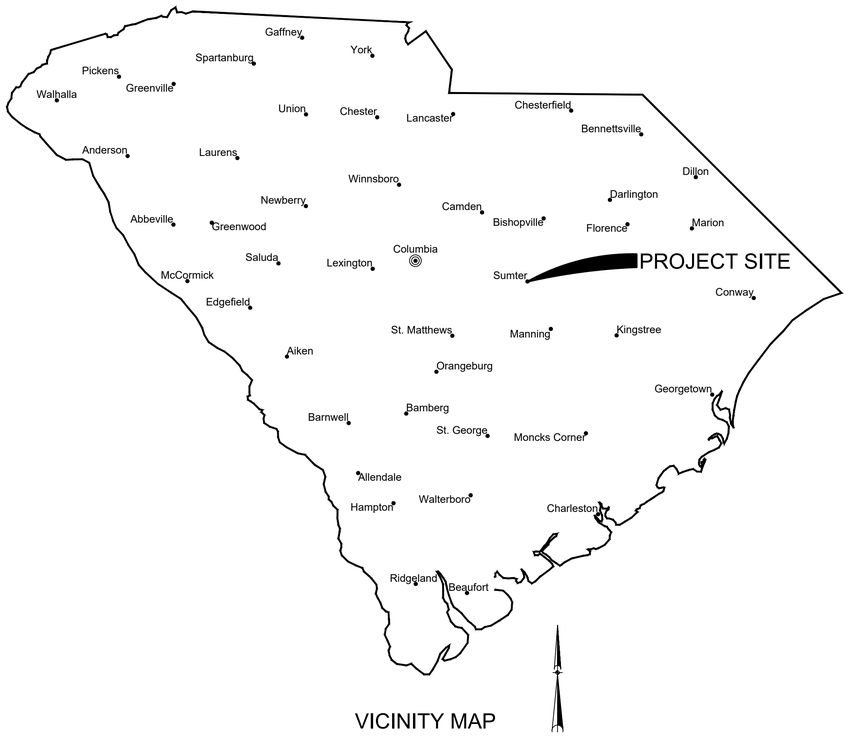
END OF SECTION

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

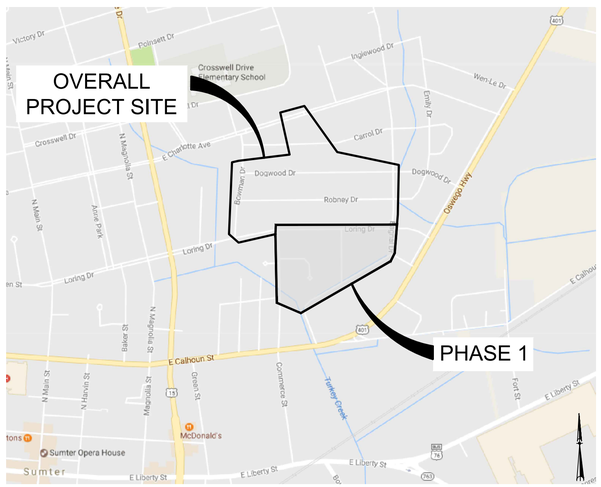
FOR

CITY OF SUMTER, SOUTH CAROLINA

CITY OF SUMTER BID NUMBER ITB#38-24/25



VICINITY MAP



LOCATION MAP

SCALE: NONE

DRAWING INDEX:

"I have placed my signature and seal on the design documents submitted signifying that I accept responsibility for the design of the system. Further, I certify to the best of my knowledge and belief that the design is consistent with the requirements of Title 48, Chapter 14 of the Code of Laws of SC, 1976 as amended, pursuant to Regulation 72-300 et, seq. (if applicable), and in accordance with the terms and conditions of SCR100000."

3 DAYS BEFORE DIGGING IN SOUTH CAROLINA

PALMETTO UTILITY PROTECTION SERVICE, INC. (PUPS)

ALL UTILITIES MAY NOT BE A MEMBER OF PUPS. COORDINATE WITH LOCAL UTILITY COMPANIES FOR MARKING OF THEIR UTILITIES ALSO.

BID DOCUMENTS

THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION

AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT

CITY OF SUMTER
303 EAST LIBERTY STREET
SUMTER, SOUTH CAROLINA, 29150
TEL: 803.436.2558

CONSULTANT

AECOM
101 RESEARCH DRIVE
COLUMBIA, SOUTH CAROLINA, 29203
803.254.4400 TEL 803.771.6675 FAX
WWW.AECOM.COM

REGISTRATION

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER
No. 35317
JASON EARL OUTLAW
March 28, 2024

SOUTH CAROLINA
AECOM TECHNICAL SERVICES, INC.
No. 1473
CERTIFICATE OF AUTHORIZATION

ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	03/28/2024	FOR BID

KEY PLAN

PROJECT NUMBER

60591852

SHEET TITLE

COVER SHEET & LOCATION MAP

SHEET NUMBER

C1

GENERAL NOTES:

1. PROJECT VERTICAL DATUM IS NAVD88. HORIZONTAL DATUM IS SCSPC NAD83 (2011).
2. REFERENCE IS MADE TO SURVEY DATED 12/12/2018 AND 6/21/2022 BY AECOM.
3. CONFINE ALL CONSTRUCTION ACTIVITIES WITHIN EASEMENTS AND RIGHT-OF-WAY AS SHOWN.
4. LOCATIONS OF EXISTING UTILITIES SHOWN ARE APPROXIMATE. FILED VERIFY ALL DEPTHS, LOCATIONS AND MATERIALS PRIOR TO STARTING CONSTRUCTION. NOTIFY THE ENGINEER IF CONDITIONS VARY FROM THOSE SHOWN ON THE PLANS.
5. MAINTAIN DRAINAGE ALONG ROADS DURING CONSTRUCTION. COMPLETE RESTORATION OF RIGHT-OF-WAY SHOULD BE DONE AS CONSTRUCTION IS COMPLETED. CONTRACTOR TO REMOVE AND REPLACE DAMAGED SIDEWALK OR CURB & GUTTER ALONG PROPERTY FRONTAGE AS NECESSARY AND/OR AS SPECIFIED BY DISTRICT PERMIT STAFF. ANY REPLACEMENT OF SIDEWALK OR CURB AND GUTTER SHALL BE REMOVED AND REPLACED FROM JOINT TO JOINT.
6. REMOVE AND REPLACE ALL PAVING, PAVEMENT MARKING, SIGNAGE, FENCING, GRASSING, LANDSCAPING, ETC., DAMAGED OR DISTURBED DURING CONSTRUCTION.
7. ANY PROPOSED SIDEWALK WITHIN THE ROW SHALL NOT EXCEED 2% CROSS SLOPE PER ADA AND PROWAG GUIDELINES. ALL RAMPS SHALL NOT EXCEED 8.33% FOR EVERY SCENARIO EXCEPT WHERE ALLOWED BY PROWAG.
8. IN PRESENCE OF SIDEWALK OR OTHER ADA PATHWAY, ACCESS(ES) TO PROVIDE A MINIMUM OF 3' PEDESTRIAN PATH OF NO GREATER CROSS SLOPE THAN 2% ACROSS THROAT OF DRIVEWAY.
9. CONTRACTOR TO SAWCUT EXISTING ASPHALT FOR SMOOTH JOINT NOT ALIGNED WITH WHEEL PATH.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR UTILIZING ALL APPLICABLE AND CURRENT SCDOT STANDARD DRAWINGS, INCLUDING BUT NOT LIMITED TO, THE DRAWINGS INCLUDED OR REFERENCED WITHIN THESE PLANS AND THE APPROVED PERMIT PACKAGE.
11. PROVIDE DRAINAGE INLET PROTECTION AT ALL CULVERTS, DROP INLETS, ETC. ALONG THE ROUTE OF CONSTRUCTION. PROVIDE SILT SAVERS (OR APPROVED EQUAL) FOR ALL GRATE INLETS AND SEDIMENT TUBES FOR ALL YARD INLETS.
12. BACKFILL TRENCHES WITH FLOWABLE FILL FOR ALL STORM DRAINAGE PIPES CROSSING UNDER ROADWAYS WITH LESS THAN 3 FEET OF COVER.
13. WHERE MAILBOXES, WATER METERS, ETC. ARE TO BE RELOCATED, PROVIDE ACCESS THROUGHOUT DURATION OF CONSTRUCTION. DEPENDING ON RELOCATION AREA, SOME ITEMS MAY NEED TO BE RE-INSTALLED IN THE ORIGINAL LOCATION.
14. ALL PROPOSED OR RELOCATED SIGNAGE SHALL BE PLACED OR REPLACED IN ACCORDANCE WITH SECTION 650-000 AND INSTALLED ON SCDOT APPROVED BREAKAWAY SIGN SUPPORTS AS DETAILED IN SECTION 654-000 IN THE SCDOT STANDARD DRAWINGS.
15. CONTRACTOR TO GRADE SHALLOW SWALES ALONG LENGTH OF ALL NEW PIPES TO PROMOTE DRAINAGE TOWARDS NEAREST DRAINAGE BOX. IN ADDITION, PERFORM FINE GRADING AROUND ALL SIDES DRAINAGE BOXES TO PROMOTE DRAINAGE.
16. WHERE EXISTING DRAINAGE INLETS ARE REMOVED FROM EDGE OF PAVEMENT, GRADE AND REPLACE PAVEMENT TO PROMOTE DRAINAGE TO NEAREST YARD INLETS SET BEHIND EDGE OF ROADWAY PAVEMENT.

COORDINATION NOTES:

1. TO EVERY EXTENT POSSIBLE, WATER AND SEWER SERVICE SHALL BE MAINTAINED DURING CONSTRUCTION TO EACH RESIDENCE/BUSINESS, ETC. BY-PASS PUMPING SHALL BE PROVIDED AS NECESSARY AT NO ADDITIONAL COST TO THE OWNER. PROVIDE TEMPORARY PLUGS AND BLOCKING AS NECESSARY TO PRESSURE TEST NEW LINES.
2. MAINTAIN STORMWATER DRAINAGE ALONG ALL ROADS DURING CONSTRUCTION.
3. PROVIDE ANY TEMPORARY UTILITIES THAT MAY BE REQUIRED TO MAINTAIN OPERATION OF EXISTING FACILITIES.
4. COORDINATE WITH THE ELECTRICAL, GAS, AND COMMUNICATIONS PROVIDERS PRIOR TO THE REMOVAL, TEMPORARY ACTIVITIES, OR RELOCATION OF ANY UTILITIES.

DEMOLITION NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEARING AND DEMOLITION OF ANY EXISTING ELEMENTS WHICH ARE IN CONFLICT WITH PROPOSED NEW CONSTRUCTION. THIS INCLUDES, BUT IS NOT LIMITED TO, FENCES, TREES, DRAINAGE STRUCTURES, POLES, PAVEMENTS, VEGETATION, SIGNS, AND OTHER MISCELANEOUS SITE ELEMENTS.
2. UNLESS OTHERWISE DIRECTED, THE CONTRACTOR SHALL PROTECT ALL TREES AND SHRUBS SCHEDULED TO REMAIN AND FENCE THOSE WHICH MAY RISK DAMAGE FROM CONSTRUCTION EQUIPMENT AT WORK.
3. ALL TREES, WHICH ARE TO BE REMOVED, SHALL BE DONE SO IN A MANNER WHICH WILL NOT INJURE PLANT MATERIAL SCHEDULED TO REMAIN. STUMPS ARE TO BE COMPLETELY REMOVED AND HAULED OFF SITE. NO BURIAL OF TREE DEBRIS WILL BE PERMITTED.
4. BURNING OF CLEARING DEBRIS WILL BE PERMITTED ONLY IF IN ACCORDANCE WITH LOCAL REGULATIONS.
5. ALL DEMOLITION DEBRIS SHALL BE DISPOSED OF OFF-SITE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS AND SPECIFICATIONS, LATEST REVISION.
6. CONTRACTOR SHALL STRIP TOPSOIL AND STOCKPILE IT FOR LATER USE.
7. CONTRACTOR SHALL PROVIDE ANY TEMPORARY UTILITIES THAT MAY BE REQUIRED TO MAINTAIN OPERATION OF EXISTING FACILITIES.
8. CONTRACTOR SHALL COORDINATE WITH THE ELECTRICAL, GAS, COMMUNICATIONS, AND WATER/SEWER PROVIDERS PRIOR TO THE REMOVAL OR RELOCATION OF ANY UTILITIES.
9. EXISTING UTILITIES SUCH AS WATER, SEWER, GAS, ELECTRICAL, FIBER, CABLE, ETC. ARE PRESENT IN THE AREA. THE EXACT LOCATION OF ALL UNDERGROUND UTILITIES SHALL BE VERIFIED PRIOR TO CONSTRUCTION. ANY AND ALL DAMAGES RESULTING FROM THE FAILURE TO DO SO SHALL BE REPAIRED AT NO EXPENSE TO THE OWNER. CONTACT PALMETTO UTILITY PROTECTION SERVICE (PUPS) AND OTHER LOCAL AND REGIONAL UTILITY LOCATING COMPANIES AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
10. KEEP ALL ROADS ADJACENT TO THE SITE CLEAN DURING CONSTRUCTION.
11. KEEP ALL DRIVEWAYS OPEN TO TRAFFIC DURING CONSTRUCTION.
12. CONTRACTOR SHALL INSTALL EROSION CONTROL MEASURES PRIOR TO CLEARING OR DEMOLITION ACTIVITIES.

AS-BUILT DRAWINGS:

1. PREPARE AS-BUILT DRAWINGS AS CONSTRUCTION PROGRESSES.
2. AS-BUILT DRAWINGS SHALL INCLUDE GPS COORDINATES OF ALL WATER FEATURES INCLUDING BENDS, VALVES, TEES, FIRE HYDRANTS, METERS, ETC. ADDITIONALLY, EACH LOCATED POINT SHALL INCLUDE A VERTICAL ELEVATION TIED TO THE PROJECT DATUM.
3. MAINTAIN A RED-LINE SET OF DRAWINGS IN THE FIELD WITH NOTATIONS OF ANY CHANGES MADE DURING CONSTRUCTION.

STAKING NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR LAYOUT OF ALL WORK AS ILLUSTRATED ON THE PLANS. IF EXISTING CONDITIONS DIFFER FROM THOSE ILLUSTRATED ON THE PLANS, NOTIFY THE ENGINEER PRIOR TO CONSTRUCTION.
2. ALL PROJECT STAKING SHALL BE PERFORMED BY A REGISTERED LAND SURVEYOR TO BE PAID BY THE CONTRACTOR. FOR STAKEOUT, DO NOT RELY SOLELY ON THE PHYSICAL SCALE AS SHOWN ON THE DRAWINGS. REFER TO GIVEN DIMENSIONS, SYMBOL LEGEND, KEYNOTES, AND REFERENCED DETAILS FOR CORRECT LAYOUT.
3. CONTRACTOR SHALL REFER TO SURVEY INFORMATION FOR ALL MONUMENTS. THE CONTRACTOR SHALL ESTABLISH A TEMPORARY MONUMENT IN THE FIELD WHICH WILL BE MAINTAINED FOR LAYOUT OPERATIONS.

PAVEMENT NOTES:

1. ALL PAVING SHALL BE SET IN CLOSE CONFORMITY TO THOSE INDICATED ON THE PLANS AND DETAILS. TOLERANCES SHALL MEET THOSE LISTED IN THE CONTRACT DOCUMENTS OR 1/10".
2. EXISTING CURB, CONCRETE, AND ASPHALT PAVEMENT SHALL BE SAWCUT FOR CLEAN EDGES. CURB AND GUTTER TO BE BARRIER TYPE UNLESS NOTED OTHERWISE.
3. ALL PAVING MATERIAL MIXES AND INSTALLATION SHALL MEET THE REQUIREMENTS OF THE SCDOT. ANY VARIANCES FROM THOSE REQUIREMENTS WILL BE AS DEFINED IN THE CONTRACT DOCUMENTS.
4. ALL NEW PAVEMENTS ABUTTING EXISTING PAVEMENT SHALL MATCH THE ELEVATIONS OF THE EXISTING.
5. PAVEMENTS SHALL BE UNIFORM IN GRADE WITH SMOOTH TRANSITIONS AT CHANGES IN SLOPE.
6. BIRDBATHS OR DEPRESSIONS WILL NOT BE ACCEPTED. AREAS WHICH EXHIBIT PONDING DEEPER THAN THE PRESCRIBED TOLERANCES WILL BE REMOVED AND RECONSTRUCTED AT THE CONTRACTOR'S EXPENSE.
7. CONTRACTOR TO FEATHER THE EDGES OF ASPHALT SURFACES, WHERE REQUIRED.
8. COMPACTION OF SUBGRADE MATERIAL TO BE VERIFIED AND ACCEPTED BY THE PAVING CONTRACTOR PRIOR TO THE START OF CONSTRUCTION.
9. ADA ACCESSIBLE RAMPS SHALL BE CONSTRUCTED AT ALL LOCATIONS WHERE PEDESTRIAN ROUTES INTERSECT VEHICLE USE AREAS AND GRADES CHANGE. ADA DETECTIBLE WARNING DEVICES (TRUNCATED DOMES) SHALL BE CONSTRUCTED AT ALL LOCATIONS WHERE PEDESTRIAN ROUTES INTERSECT VEHICLE USE AREAS, REGARDLESS OF GRADE CHANGE.
10. CONTRACTOR SHALL COMPLY WITH ALL SPECIAL PROVISIONS OF THE SCDOT ENCROACHMENT PERMIT.
11. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TRAFFIC CONTROL.

SIGN & STRIPING NOTES:

1. ALL SURFACES SHOULD BE CLEAN AND DRY BEFORE PAINTING. METAL SURFACES SHOULD BE FREE OF HEAVY RUST.
2. PARKING LOT STRIPING SHALL BE WHITE TRAFFIC MARKING PAINT, UNLESS NOTED OTHERWISE. PAINT SHALL BE SHERWIN-WILLIAMS "PRO-MAR" TRAFFIC MARKING PAINT OR GLIDDEN TRAFFIC PAINT, OR APPROVED EQUAL, AND SHALL BE APPLIED IN TWO COATS IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
3. ITEMS TO BE PAINTED WHITE INCLUDE: PARKING STALLS, DIRECTIONAL ARROWS OF SIZE AND LOCATION INDICATED ON THE DRAWINGS, STOP BARS, AND PEDESTRIAN CROSSWALKS.
4. ITEMS TO BE PAINTED YELLOW INCLUDE: DOUBLE ROADWAY CENTERLINES, MEDIANS, AND PIPE BOLLARDS.
5. ITEMS TO BE PAINTED BLUE INCLUDE: HANDICAP PARKING STALLS AND SYMBOLS, ALL STRIPED AISLES ADJACENT TO HANDICAP SPACES, AND ALL PEDESTRIAN CROSSING AREAS CONNECTING HANDICAP SPACES. AISLES AND CROSSWALKS SHALL BE STRIPED 24" ON CENTER AT 45 DEGREE ANGLE.
6. ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
7. ALL PAVEMENT MARKINGS SHALL BE 4 INCHES WIDE AND 30 MIL THICK, UNLESS NOTED OTHERWISE.
8. ALL PAVEMENT MARKINGS WITHIN THE SCDOT RIGHT-OF-WAY SHALL BE THERMOPLASTIC.

WATERLINE NOTES:

1. ALL WATERLINES REPRESENTED IN THESE DRAWINGS WERE DRAWN ACCORDING TO INFORMATION GATHERED FROM RECORD DRAWINGS AND GIS DATA. THE LOCATION OF ALL EXISTING WATERLINES SHOULD BE FIELD VERIFIED.
2. THE MATERIALS AND CONSTRUCTION OF ALL WATER SYSTEM FACILITIES IN THIS PROJECT SHALL BE GOVERNED BY SCDHEC REGULATIONS AND THE CITY OF SUMTER SPECIFICATIONS, LATEST EDITION. ALL WATERLINE PIPE SHALL BE BLUE C-900 PVC UNLESS NOTED OTHERWISE.
3. NO CONSTRUCTION IS ALLOWED UNTIL A PERMIT TO CONSTRUCT IS RECEIVED FROM SCDHEC.
4. NOTIFY THE CITY OF SUMTER 48 HOURS PRIOR TO CONSTRUCTION.
5. REQUEST PERMISSION FROM THE CITY OF SUMTER TO SHUT-OFF WATER LINES AT LEAST 14 DAYS PRIOR TO SHUT-OFF.
6. ALL WATERLINES SHALL HAVE A MINIMUM 36" COVER. WATERLINES UNDER STORMWATER DITCHES SHALL HAVE A MINIMUM OF 48" COVER. WATERLINES INSTALLED IN THE SCDOT ROAD SHOULDER SHALL HAVE A MINIMUM OF 42" COVER.
7. USE FITTINGS AS NECESSARY. ALL FITTINGS SHALL BE INSTALLED WITH MEGALUG RESTRAINTS, OR APPROVED EQUAL.
8. RESTRAINED JOINTS ARE REQUIRED FOR ALL FITTINGS.
9. DUCTILE IRON PIPE MUST BE INSTALLED UNDER ALL ROADWAYS, STORM WATER AND SANITARY SEWER CROSSINGS.
10. ALL RELOCATED WATER METERS SHALL CONNECT BACK TO CUSTOMERS SIDE WITH PVC AND THE SERVICE LINES FROM THE WATER DISTRIBUTION LINE TO THE METERS SHALL BE BLUE COLOR CTS/250 PSI W/ TRACER WIRE..
11. NO PORTION OF THE WORK SHALL BE PLACED INTO SERVICE UNTIL SCDHEC HAS ISSUED A PERMIT TO OPERATE. FAILURE TO COMPLY IS A VIOLATION OF SOUTH CAROLINA STATE LAW.
12. PROVIDE DISINFECTION FOR ALL POTABLE WATERLINES PER SCDHEC REGULATIONS.

SEWER NOTES:

1. THE MATERIALS AND CONSTRUCTION OF ALL SANITARY SEWER SYSTEM FACILITIES IN THIS PROJECT SHALL BE GOVERNED BY SCDHEC REGULATIONS AND THE CITY OF FLORENCE SPECIFICATIONS, LATEST EDITION.
2. WHERE POSSIBLE, CONTRACTOR SHALL ROUTE SEWER SERVICE RELOCATIONS BELOW OR ABOVE STORM DRAINAGE WHILE MAINTAINING MINIMUM REQUIRED SLOPES. GRAVITY SEWERS SHALL CONNECT TO EXISTING GRAVITY SEWER LINES.
3. WHERE DETERMINED NOT POSSIBLE TO ROUTE BELOW OR ABOVE STORM DRAINAGE, CORE HOLE AND ROUTE SEWER SERVICE THROUGH PIPES 48" OR GREATER WITH DUCTILE IRON PIPE. PIPE SHOULD BE LOCATED WITHIN THE TOP ⅓ SECTION OF THE RCP.
4. ALL GRAVITY SEWER PIPE SHALL BE PVC SDR 35 "GREEN" OR PROTECTO 401 COATED DIP (MIN. CLASS 52) UNLESS OTHERWISE NOTED.
5. NOTIFY THE CITY OF SUMTER 48 HOURS PRIOR TO CONSTRUCTION.

LEGEND

- EXISTING STORMWATER PIPE
- PROPOSED STORMWATER PIPE
- ROW BOUNDARY
- SURVEYED EDGE OF ROAD
- TB — TOP OF BANK
- BB — BOTTOM OF BANK
- X — FENCE
- OHP — OVERHEAD POWER LINE
- SS — EXISTING SANITARY SEWER LINE
- W — EXISTING WATER LINE
- G — EXISTING GAS LINE
- EXISTING STORM INLET
- POWER POLE
- YI — PROPOSED STORM YARD INLET
- DI — PROPOSED STORM DROP INLET
- LP — LIGHT POLE
- MH — SANITARY SEWER MANHOLE
- WV — GATE VALVE
- FH — FIRE HYDRANT
- CTVP — CABLE LINE
- TPED — TELEPHONE PEDESTAL
- PROPERTY LINE

BID DOCUMENTS

THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION

AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT

CITY OF SUMTER
303 EAST LIBERTY STREET
SUMTER, SOUTH CAROLINA, 29150
TEL: 803.436.2558

CONSULTANT

AECOM
101 RESEARCH DRIVE
COLUMBIA, SOUTH CAROLINA, 29203
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REGISTRATION

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 35317 JASON EARL OUTLAW
March 28, 2024

SOUTH CAROLINA AECOM TECHNICAL SERVICES, INC. No. 1473 CERTIFICATE OF AUTHORIZATION

ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	03/28/2024	FOR BID

KEY PLAN

PROJECT NUMBER

60591852

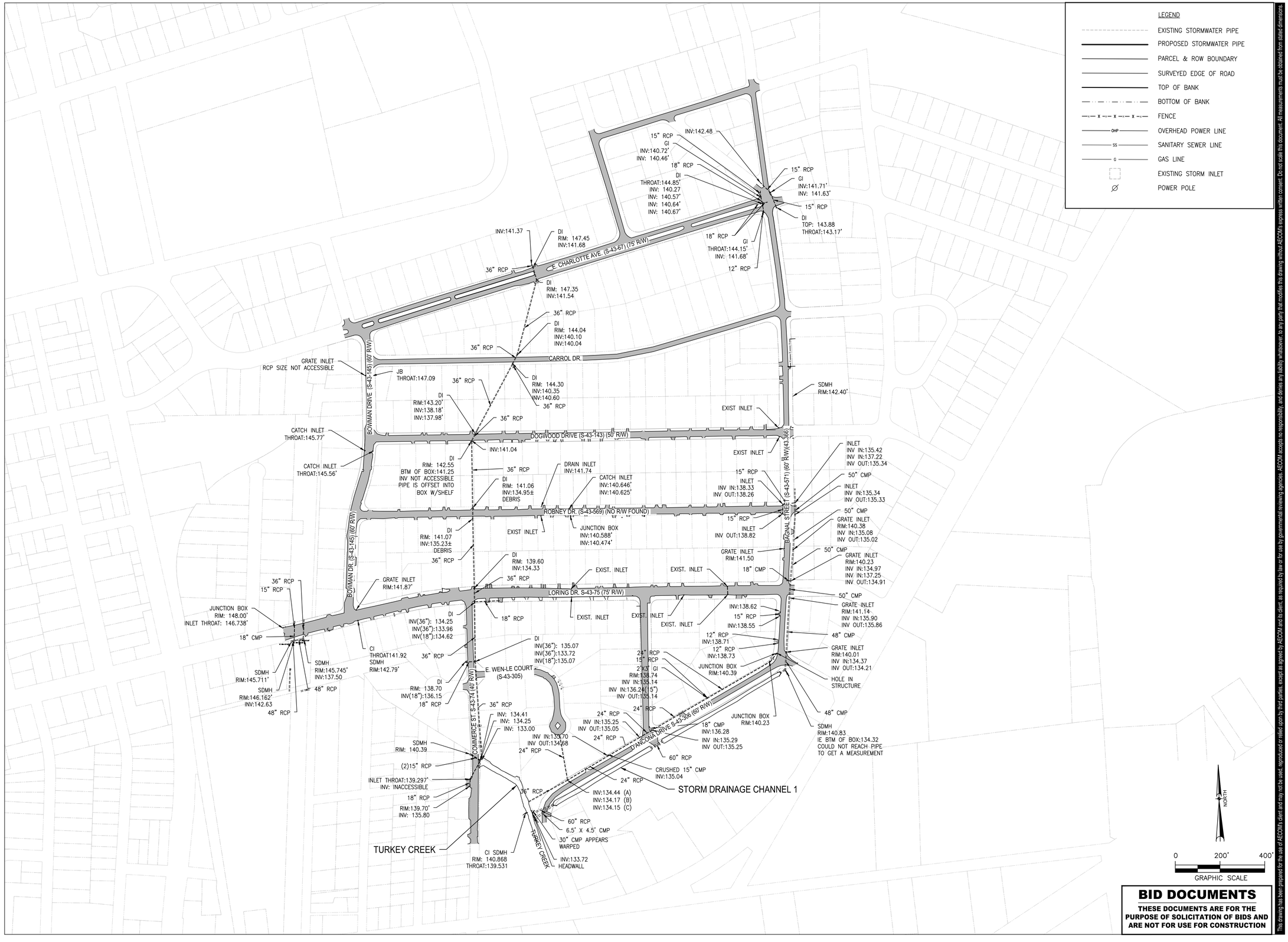
SHEET TITLE

GENERAL NOTES & LEGEND

SHEET NUMBER

C1.1

Filename: L:\LEGACY22855R-C87001\CAEINTEROFFICE\60591852_SUMTER CROSSWELL STORMWATER\900-WORK\910-DRAWINGS\PHASE 1\SHEETS\60591852_C-000-COVER SHEET.DWG



BID DOCUMENTS

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Filename: L:\LEGACY\2285SR-C87001\CAE\INTEROFFICE\60591852_SUMTER CROSSWELL STORMWATER\900-WORK\910-DRAWINGS\PHASE 1\SHEETS\60591852_C-002-EXISTING CONDITIONS.DWG

AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT

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I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60591852

SHEET TITLE

EXISTING CONDITIONS

SHEET NUMBER

C2

LEGEND

- EXISTING STORMWATER PIPE
- PROPOSED STORMWATER PIPE
- PARCEL & ROW BOUNDARY
- SURVEYED EDGE OF ROAD
- TOP OF BANK
- BOTTOM OF BANK
- FENCE
- OVERHEAD POWER LINE
- SANITARY SEWER LINE
- GAS LINE
- EXISTING STORM INLET
- POWER POLE

GENERAL NOTES:

1. PROJECT VERTICAL DATUM IS NAVD88. HORIZONTAL DATUM IS SCSPC NAD83 (2011).
2. CONFINE ALL CONSTRUCTION ACTIVITIES WITHIN EASEMENTS AND RIGHT-OF-WAY AS SHOWN.
3. LOCATIONS OF EXISTING UTILITIES SHOWN ARE APPROXIMATE. FILED VERIFY ALL DEPTHS, LOCATIONS AND MATERIALS PRIOR TO STARTING CONSTRUCTION. NOTIFY THE ENGINEER IF CONDITIONS VARY FROM THOSE SHOWN ON THE PLANS.
4. MAINTAIN DRAINAGE ALONG ROADS DURING CONSTRUCTION. COMPLETE RESTORATION OF RIGHT-OF-WAY SHOULD BE DONE AS CONSTRUCTION IS COMPLETED. CONTRACTOR TO REMOVE AND REPLACE DAMAGED SIDEWALK OR CURB & GUTTER ALONG PROPERTY FRONTAGE AS NECESSARY AND/OR AS SPECIFIED BY DISTRICT PERMIT STAFF. ANY REPLACEMENT OF SIDEWALK OR CURB AND GUTTER SHALL BE REMOVED AND REPLACED FROM JOINT TO JOINT.
5. REMOVE AND REPLACE ALL PAVING, PAVEMENT MARKING, SIGNAGE, FENCING, GRASSING, LANDSCAPING, ETC., DAMAGED OR DISTURBED DURING CONSTRUCTION.
6. ANY PROPOSED SIDEWALK WITHIN THE ROW SHALL NOT EXCEED 2% CROSS SLOPE PER ADA AND PROWAG GUIDELINES. ALL RAMPS SHALL NOT EXCEED 8.33% FOR EVERY SCENARIO EXCEPT WHERE ALLOWED BY PROWAG.
7. IN PRESENCE OF SIDEWALK OR OTHER ADA PATHWAY, ACCESS(ES) TO PROVIDE A MINIMUM OF 3' PEDESTRIAN PATH OF NO GREATER CROSS SLOPE THAN 2% ACROSS THROAT OF DRIVEWAY.
8. CONTRACTOR TO SAWCUT EXISTING ASPHALT FOR SMOOTH JOINT NOT ALIGNED WITH WHEEL PATH.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR UTILIZING ALL APPLICABLE AND CURRENT SCDOT STANDARD DRAWINGS, INCLUDING BUT NOT LIMITED TO, THE DRAWINGS INCLUDED OR REFERENCED WITHIN THESE PLANS AND THE APPROVED PERMIT PACKAGE.
10. PROVIDE DRAINAGE INLET PROTECTION AT ALL CULVERTS, DROP INLETS, ETC. ALONG THE ROUTE OF CONSTRUCTION. PROVIDE SILT SAVERS (OR APPROVED EQUAL) FOR ALL GRATE INLETS AND SEDIMENT TUBES FOR ALL YARD INLETS.
11. BACKFILL TRENCHES WITH FLOWABLE FILL FOR ALL STORM DRAINAGE PIPES CROSSING UNDER ROADWAYS WITH LESS THAN 3 FEET OF COVER.
12. WHERE MAILBOXES, WATER METERS, ETC. ARE TO BE RELOCATED, PROVIDE ACCESS THROUGHOUT DURATION OF CONSTRUCTION. DEPENDING ON RELOCATION AREA, SOME ITEMS MAY NEED TO BE RE-INSTALLED IN THE ORIGINAL LOCATION.
13. ALL PROPOSED OR RELOCATED SIGNAGE SHALL BE PLACED OR REPLACED IN ACCORDANCE WITH SECTION 650-000 AND INSTALLED ON SCDOT APPROVED BREAKAWAY SIGN SUPPORTS AS DETAILED IN SECTION 654-000 IN THE SCDOT STANDARD DRAWINGS.
14. CONTRACTOR TO GRADE SHALLOW SWALES ALONG LENGTH OF ALL NEW PIPES TO PROMOTE DRAINAGE TOWARDS NEAREST DRAINAGE BOX. IN addition, PERFORM FINE GRADING AROUND ALL SIDES DRAINAGE BOXES TO PROMOTE DRAINAGE.
15. WHERE EXISTING DRAINAGE INLETS ARE REMOVED FROM EDGE OF PAVEMENT, GRADE AND REPLACE PAVEMENT TO PROMOTE DRAINAGE TO NEAREST YARD INLETS SET BEHIND EDGE OF ROADWAY PAVEMENT.

NORTH

0 200' 400'

GRAPHIC SCALE

BID DOCUMENTS

THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION

AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	03/28/2024	FOR BID

KEY PLAN

PROJECT NUMBER

60591852

SHEET TITLE

OVERALL STORMWATER IMPROVEMENT PLAN

SHEET NUMBER

C3.1

Filename: L:\LEGACY\2285SR-C87001\CAE\INTEROFFICE\60591852_SUMTER CROSSWELL STORMWATER\900-WORK\910-DRAWINGS\PHASE 1\SHEETS\60591852_C-003 OVERALL SITE LAYOUT.DWG

STORM DRAINAGE PIPE SCHEDULE

PIPE	SIZE (IN)	LENGTH (LF)	SLOPE	TYPE	CROSS SECTIONAL SHAPE	UPSTREAM INVERT	DOWNSTREAM INVERT	UPSTREAM NODE	DOWNSTREAM NODE
1–1	42	43.597	0.23%	RCP	Circular	137.600	137.500	1–1	HW 1–5
1–3	42	54.133	0.34%	RCP	Circular	138.300	138.116	1–3	1–2
1–4	42	356.596	0.32%	RCP	Circular	139.450	138.300	1–4	1–3
1–6	36	60.166	0.33%	RCP	Circular	139.900	139.700	1–6	1–5
1–8	36	126.252	0.33%	RCP	Circular	140.900	140.489	1–8	1–7A
1–9	24	262.598	0.25%	RCP	Circular	141.556	140.900	1–9	1–8
1–10	18	39.631	0.25%	RCP	Circular	141.655	141.556	1–10	1–9
2–9	42	39.488	0.25%	RCP	Circular	136.959	136.860	2–9	2–8
2–8	42	302.433	0.25%	RCP	Circular	136.861	136.105	2–8	2–7
2–6	42	153.795	0.33%	RCP	Circular	136.012	135.500	2–6	2–5
2–5	42	163.253	0.25%	RCP	Circular	135.500	135.100	2–5	2–4
2–4	42	60.043	0.32%	RCP	Circular	135.100	134.900	2–4	2–3
2–3	48	131.977	0.26%	RCP	Circular	134.900	134.550	2–3	2–2A
2–2	48	91.522	0.22%	RCP	Circular	134.200	134.000	2–2	2–1
2–1	48	329.848	0.29%	RCP	Circular	134.000	133.049	2–1	2–1A
2–7	42	37.165	0.25%	RCP	Circular	136.105	136.012	2–7	2–6
3–12	42	133.179	0.25%	RCP	Circular	137.719	137.386	3–16	3–15
3–11	42	56.461	0.25%	RCP	Circular	137.386	137.245	3–15	3–14
3–10	42	291.771	0.25%	RCP	Circular	137.245	136.516	3–14	3–13
3–9	42	43.662	0.25%	RCP	Circular	136.516	136.407	3–13	3–12
3–8	42	157.483	0.25%	RCP	Circular	136.407	136.013	3–12	3–11
3–7	42	137.201	0.25%	RCP	Circular	136.013	135.670	3–11	3–10
3–5	42	247.402	0.25%	RCP	Circular	135.430	134.798	3–9	3–8
3–4	42	34.669	0.25%	RCP	Circular	134.798	134.705	3–8	3–7
3–3	48	321.429	0.23%	RCP	Circular	134.705	133.958	3–7	3–6
3–2	48	60.199	0.22%	RCP	Circular	133.274	133.134	3–5	3–4
3–1	48	160.352	0.22%	RCP	Circular	133.128	132.774	3–4	3–3
4–14	48	146.318	0.53%	RCP	Circular	137.780	137.000	4–14	TL4–13
4–13	48	37.028	0.23%	RCP	Circular	137.000	136.914	TL4–13	4–12
4–12	48	83.052	0.20%	RCP	Circular	136.913	136.743	4–12	4–11
4–10	48	38.034	0.18%	RCP	Circular	136.350	136.280	4–10	4–9
4–8	48	147.228	0.06%	RCP	Circular	135.960	135.870	4–8	4–7
4–7	48	68.492	0.15%	RCP	Circular	135.870	135.770	4–7	4–6
4–6	48	180.321	0.14%	RCP	Circular	135.770	135.520	4–6	4–5
4–5	48	56.070	0.16%	RCP	Circular	135.520	135.430	4–5	4–4
4–4	48	86.512	0.13%	RCP	Circular	135.430	135.320	4–4	4–3
4–3	48	22.781	0.18%	RCP	Circular	135.320	135.280	4–3	HW 4–5
4–2	60	66.161	0.25%	RCP	Circular	134.500	134.335	HW 4–4	PE–1
4–1	60	105.297	0.29%	RCP	Circular	133.850	133.540	HW 4–2	OUTFALL–1D
4–9	48	169.860	0.13%	RCP	Circular	136.280	136.060	4–9	4–8
1A–1	30	66.082	0.50%	RCP	Circular	138.630	138.300	1A–1	1–3
1B–3	18	41.882	0.25%	RCP	Circular	140.640	140.535	1B–3	1B–2
1B–2	24	126.190	0.12%	RCP	Circular	140.000	139.851	1B–2	1B–1
3B–3	24	36.561	0.68%	RCP	Circular	141.550	141.300	3B–3	3B–2
3B–2	30	254.826	0.51%	RCP	Circular	140.800	139.500	3B–2	3B–1
3B–1	30	261.004	0.57%	RCP	Circular	139.500	138.000	3B–1	3–14
3C–1	24	37.237	1.80%	RCP	Circular	141.000	140.330	3C–1	3B–1
2B–1	36	40.676	0.53%	RCP	Circular	134.927	134.710	2B–1	2–2
TL1 (EXT–B) 1–1	48	49.814	0.24%	RCP	Circular	134.420	134.300	(EXT–B) 1–1	HW 1–1
3E–1	24	39.203	0.25%	RCP	Circular	137.241	137.143	3E–1	3D–2
3D–3	24	111.055	0.25%	RCP	Circular	137.421	137.143	3D–3	3D–2
2C–5	24	78.638	0.13%	RCP	Circular	138.100	138.000	2C–5	2C–4
2C–4	24	128.067	0.16%	RCP	Circular	138.000	137.799	2C–4	2C–3
2C–2	24	145.596	0.19%	RCP	Circular	137.600	137.325	2C–2	2C–1
2F–1	24	43.783	1.60%	RCP	Circular	138.300	137.600	2F–1	2C–2
2E–1	24	38.747	0.26%	RCP	Circular	138.100	138.000	2E–1	2C–4
3D–5	24	40.107	0.25%	RCP	Circular	137.947	137.847	3D–5	3D–4
1–2	42	132.843	0.39%	RCP	Circular	138.116	137.600	1–2	1–1
1–5	42	25.672	0.39%	RCP	Circular	139.700	139.600	1–5	1–4
1–7	36	54.759	0.30%	RCP	Circular	140.064	139.900	1–7	1–6
1D–1	30	55.836	0.41%	RCP	Circular	141.131	140.900	1D–1	1–8
1B–1	24	175.027	0.09%	RCP	Circular	139.851	139.700	1B–1	1–5
2C–1)	24	67.552	0.19%	RCP	Circular	137.325	137.200	2C–1	2–6

STORM DRAINAGE PIPE SCHEDULE

PIPE	SIZE (IN)	LENGTH (LF)	SLOPE	TYPE	CROSS SECTIONAL SHAPE	UPSTREAM INVERT	DOWNSTREAM INVERT	UPSTREAM NODE	DOWNSTREAM NODE
2G–1	24	35.754	0.40%	RCP	Circular	137.470	137.325	2G–1	2C–1
2C–3	24	94.403	0.21%	RCP	Circular	137.799	137.600	2C–3	2C–2
2C–6	24	192.582	0.18%	RCP	Circular	138.452	138.100	2C–6	2C–5
3D–4	24	170.580	0.25%	RCP	Circular	137.847	137.421	3D–4	3D–3
3–6	42	94.898	0.25%	RCP	Circular	135.671	135.430	3–10	3–9
4–11	48	212.310	0.19%	RCP	Circular	136.743	136.350	4–11	4–10
3D–2	24	166.115	0.25%	RCP	Circular	137.143	136.724	3D–2	3D–1
3D–1	24	125.236	0.25%	RCP	Circular	136.724	136.407	3D–1	3–12
3F–1	24	36.469	0.25%	RCP	Circular	136.819	136.724	3F–1	3D–1
3A–5	24	57.998	0.26%	RCP	Circular	136.989	136.829	3A–6	3A–5
3A–4	24	114.929	0.25%	RCP	Circular	136.829	136.535	3A–5	3A–4A
3A–3	24	110.129	0.25%	RCP	Circular	136.325	136.042	3A–4	3A–3
3A–2	24	46.063	0.38%	RCP	Circular	135.659	135.480	3A–2	3A–1
3A–1	24	28.236	0.16%	RCP	Circular	135.481	135.430	3A–1	3–9
3G–1	24	48.699	0.25%	RCP	Circular	135.788	135.659	3G–1	3A–2
3H–1	24	51.057	0.25%	RCP	Circular	136.460	136.325	3H–1	3A–4
2D–5	24	57.671	0.25%	RCP	Circular	136.892	136.740	2D–6	2D–5
2D–3	24	147.417	0.25%	RCP	Circular	135.985	135.609	2D–3	2D–2
2D–2	24	188.596	0.25%	RCP	Circular	135.609	135.130	2D–2	2D–1
2D–1	24	87.961	0.25%	RCP	Circular	135.130	134.900	2D–1	2–3
2H–1	24	59.238	0.22%	RCP	Circular	135.268	135.130	2H–1	2D–1
2J–1	24	56.910	0.25%	RCP	Circular	135.759	135.609	2J–1	2D–2
2K–2	24	42.763	0.25%	RCP	Circular	136.099	135.985	2K–2	2D–3
1–8 (1)	36	109.845	0.39%	RCP	Circular	140.489	140.064	1–7A	1–7
2–0	48	19.236	0.25%	RCP	Circular	133.049	133.000	2–1A	HW 2–1
2–3 (1)	48	131.879	0.27%	RCP	Circular	134.550	134.200	2–2A	2–2
TL1 (EXT–A) 1–2	48	82.454	0.24%	RCP	Circular	137.500	137.300	HW 1–4	(EXT A) 1–1
TL1 (EXT–A) 1–1	48	151.862	0.21%	RCP	Circular	137.300	136.980	(EXT A) 1–1	HW 1–3
TL1 (EXT–B) 1–2	48	19.198	0.31%	RCP	Circular	134.420	134.480	(EXT–B) 1–1	HW 1–2
(276)	30	47.395	0.71%	RCP	Circular	142.350	142.000	1C–1	1–8
2D–4 (1)	24	284.766	0.26%	RCP	Circular	136.740	135.985	2D–5	2D–3
3–1 (1)	48	194.677	0.22%	RCP	Circular	132.316	131.888	3–2	HW 3–1
3–1 (2)	48	205.806	0.22%	RCP	Circular	132.774	132.316	3–3	3–2
3–3 (1)	48	282.807	0.23%	RCP	Circular	133.958	133.295	3–6	3–5
3A–3 (1)	24	150.280	0.25%	RCP	Circular	136.042	135.659	3A–3	3A–2
3(J)–1	18	43.555	0.25%	RCP	Circular	136.656	136.540	3(J)–1	3A–3
3A–4 (2)	24	80.830	0.25%	RCP	Circular	136.535	136.325	3A–4A	3A–4

NOTE:

1. PIPE AND STRUCTURE TABLES REPRESENT THE SUMTER CROSSWELL DRAINAGE IMPROVEMENTS PHASE 1–4 AND ARE SHOWN FOR REFERENCE.
2. CONTRACTOR TO DETERMINE FROM PLAN SHEETS WHICH PIPES AND STRUCTURES ARE LOCATED IN PHASE 1.

BID DOCUMENTS

THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION

AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT

CITY OF SUMTER
303 EAST LIBERTY STREET
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REGISTRATION

SOUTH CAROLINA PROFESSIONAL ENGINEER
LICENSED
No. 35317
JASON EARL OUTLAW
March 28, 2024

SOUTH CAROLINA
AECOM TECHNICAL SERVICES, INC.
No. 1473
CERTIFICATE OF AUTHORIZATION

ISSUE/REVISION

1	03/28/2024	FOR BID
I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60591852

SHEET TITLE

PIPE TABLES

SHEET NUMBER

C3.2

Filename: I:\LEGACY\22855R-C87001\CAE\INTEROFFICE\60591852_SUMTER CROSSWELL STORMWATER\900-WORK\910-DRAWINGS\PHASE 1\SHEETS\60591852_C-003 OVERALL SITE LAYOUT.DWG

STORM DRAINAGE STRUCTURE SCHEDULE

STRUCTURE	STRUCTURE INVERT OUT	STRUCTURE INVERT IN	FLOW ELEVATION	TYPE
(EXT-B) 1-1	134.42 134.42		140.42	DI
(EXT A) 1-1	137.30	137.30	144.50	YI
1-1	137.60	137.60	145.63	YI
1-2	138.12	138.12	143.22	YI
1-3	138.30	138.30 138.30	142.57	YI
1-4	139.45	139.60	145.55	YI
1-5	139.70	139.70 139.70	145.54	DI
1-6	139.90	139.90	146.05	YI
1-7	140.06	140.06	146.30	YI
1-7A	140.49	140.49	146.42	YI
1-8	140.90	140.90 142.00 140.90	146.40	YI
1-9	141.56	141.56	144.36	YI
1-10	141.66		144.64	YI
1A-1	138.63		142.13	DI
1B-1	139.85	139.85	144.37	YI
1B-2	140.00	140.54	143.81	YI
1B-3	140.64		143.62	YI
1C-1	142.35		146.70	YI
1D-1	141.13		147.21	YI
2-1	134.00	134.00	139.00	YI
2-1A	133.05	133.05	139.28	YI
2-2	134.20	134.20 134.71	138.99	DI
2-2A	134.55	134.55	139.50	YI
2-3	134.90	134.90 134.90	139.25	YI
2-4	135.10	135.10	139.66	DI
2-5	135.50	135.50	141.53	YI
2-6	136.01	136.01 137.20	141.71	YI

STORM DRAINAGE STRUCTURE SCHEDULE

STRUCTURE	STRUCTURE INVERT OUT	STRUCTURE INVERT IN	FLOW ELEVATION	TYPE
2-7	136.10	136.10	141.34	DI
2-8	136.86	136.86	143.02	DI
2-9	136.96		143.44	YI
2B-1	134.93		138.36	DI
2C-1	137.33	137.33 137.33	142.00	YI
2C-2	137.60	137.60 137.60	141.69	YI
2C-3	137.80	137.80	141.88	YI
2C-4	138.00	138.00 138.00	141.20	YI
2C-5	138.10	138.10	141.50	YI
2C-6	138.45		142.18	YI
2D-1	135.13	135.13 135.13	139.45	YI
2D-2	135.61	135.61 135.61	140.15	YI
2D-3	135.99	135.98 135.98	138.90	YI
2D-5	136.74	136.74	139.85	YI
2D-6	136.89		140.00	YI
2E-1	138.10		141.77	YI
2F-1	138.30		142.09	YI
2G-1	137.47		142.28	DI
2H-1	135.27		139.70	YI
2J-1	135.76		139.75	YI
2K-2	136.10		139.55	DI
3-2	132.32	132.32	138.47	DI
3-3	132.77	132.77	138.81	DI
3-4	133.13	133.13	138.65	YI
3-5	133.27	133.30	138.99	DI
3-6	133.96	133.96	138.90	DI
3-7	134.70	134.70	139.75	YI

STORM DRAINAGE STRUCTURE SCHEDULE

STRUCTURE	STRUCTURE INVERT OUT	STRUCTURE INVERT IN	FLOW ELEVATION	TYPE
3-8	134.80	134.80	139.75	DI
3-9	135.43	135.43 135.43	140.30	YI
3-10	135.67	135.67	140.35	YI
3-11	136.01	136.01	141.19	DI
3-12	136.41	136.41 136.41	141.73	DI
3-13	136.52	136.52	141.31	YI
3-14	137.25	137.24 138.00	142.57	YI
3-15	137.39	137.39	143.44	YI
3-16	137.72		143.57	YI
3(J)-1	136.66		139.95	DI
3A-1	135.48	135.48	140.80	JB
3A-2	135.66	135.66 135.66	140.25	YI
3A-3	136.04	136.04 136.54	139.25	YI
3A-4	136.32	136.32 136.32	140.15	YI
3A-4A	136.53	136.54	139.90	YI
3A-5	136.83	136.83	140.25	YI
3A-6	136.99		140.50	YI
3B-1	139.50	139.50 140.33	144.96	YI
3B-2	140.80	141.30	145.11	YI
3B-3	141.55		145.71	YI
3C-1	141.00		144.81	DI
3D-1	136.72	136.72 136.72	141.89	YI
3D-2	137.14	137.14 137.14	142.27	YI
3D-3	137.42	137.42	142.54	YI
3D-4	137.85	137.85	142.16	YI
3D-5	137.95		142.64	YI
3E-1	137.24		142.51	DI

STORM DRAINAGE STRUCTURE SCHEDULE

STRUCTURE	STRUCTURE INVERT OUT	STRUCTURE INVERT IN	FLOW ELEVATION	TYPE
3F-1	136.82		142.12	YI
3G-1	135.79		140.15	YI
3H-1	136.46		140.50	YI
4-3	135.32	135.32	140.68	YI
4-4	135.43	135.43	140.45	YI
4-5	135.52	135.52	140.59	YI
4-6	135.77	135.77	140.19	YI
4-7	135.87	135.87	140.42	YI
4-8	135.96	136.06	141.00	YI
4-9	136.28	136.28	141.65	DI
4-10	136.35	136.35	142.20	YI
4-11	136.74	136.74	142.71	DI
4-12	136.91	136.91	142.48	YI
4-14	137.78		142.55	YI
HW 1-1		134.30	139.22	HW
HW 1-2		134.48	139.40	HW
HW 1-3		136.98	141.90	HW
HW 1-4	137.50		142.42	HW
HW 1-5		137.50	141.88	HW
HW 2-1		133.00	137.92	HW
HW 3-1		131.89	136.80	HW
HW 4-2	133.85		139.85	
HW 4-4	134.50		140.30	Null Structure
HW 4-5		135.28	140.20	HW
OUTFALL-1D		133.54	139.54	HW
PE-1		134.33	140.13	Null Structure
TL4-13	137.00	137.00	142.77	YI

BID DOCUMENTS

THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION

AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT

CITY OF SUMTER
303 EAST LIBERTY STREET
SUMTER, SOUTH CAROLINA, 29150
TEL: 803.436.2558

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101 RESEARCH DRIVE
COLUMBIA, SOUTH CAROLINA, 29203
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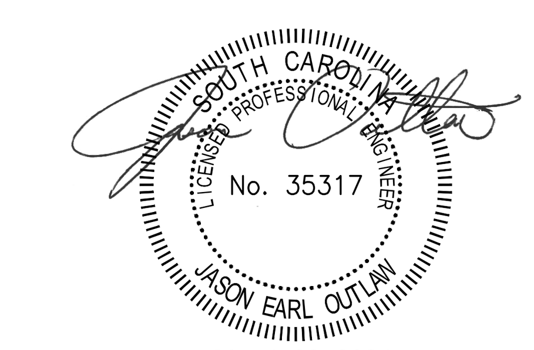
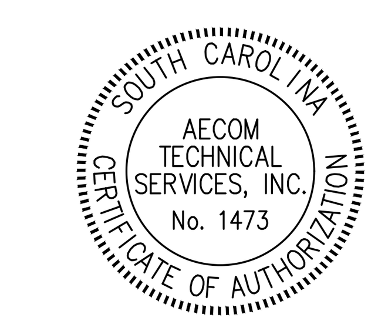
WWW.AECOM.COM

REGISTRATION



March 28, 2024



ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	03/28/2024	FOR BID

KEY PLAN

PROJECT NUMBER

60591852

SHEET TITLE

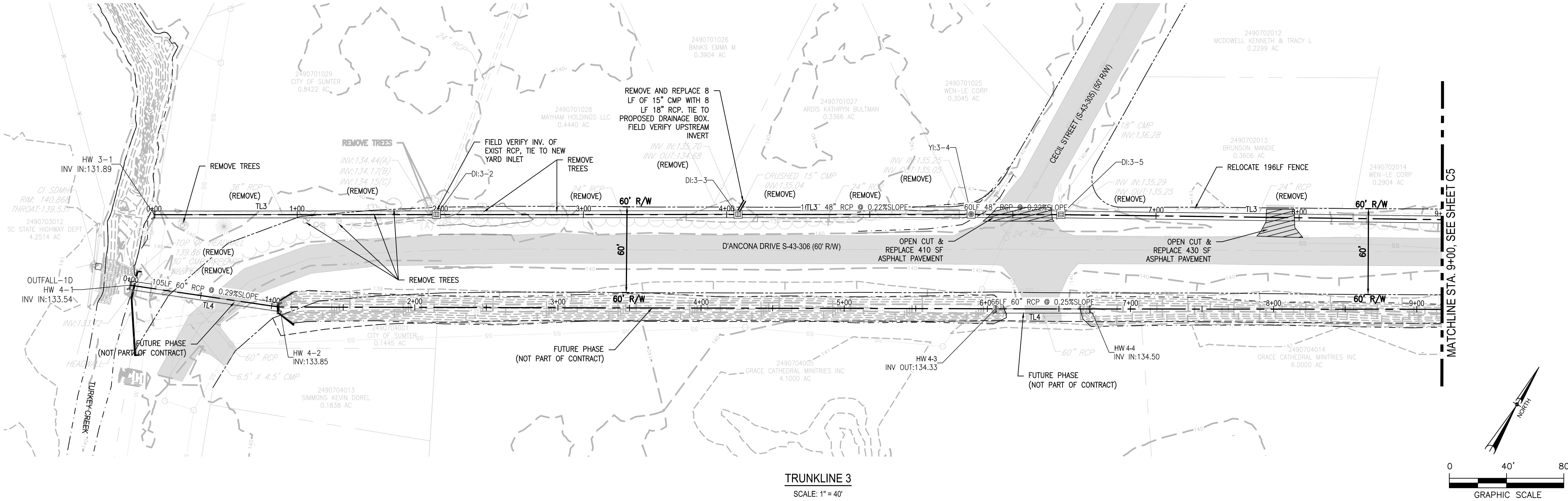
STRUCTURE TABLES

SHEET NUMBER

C3.3

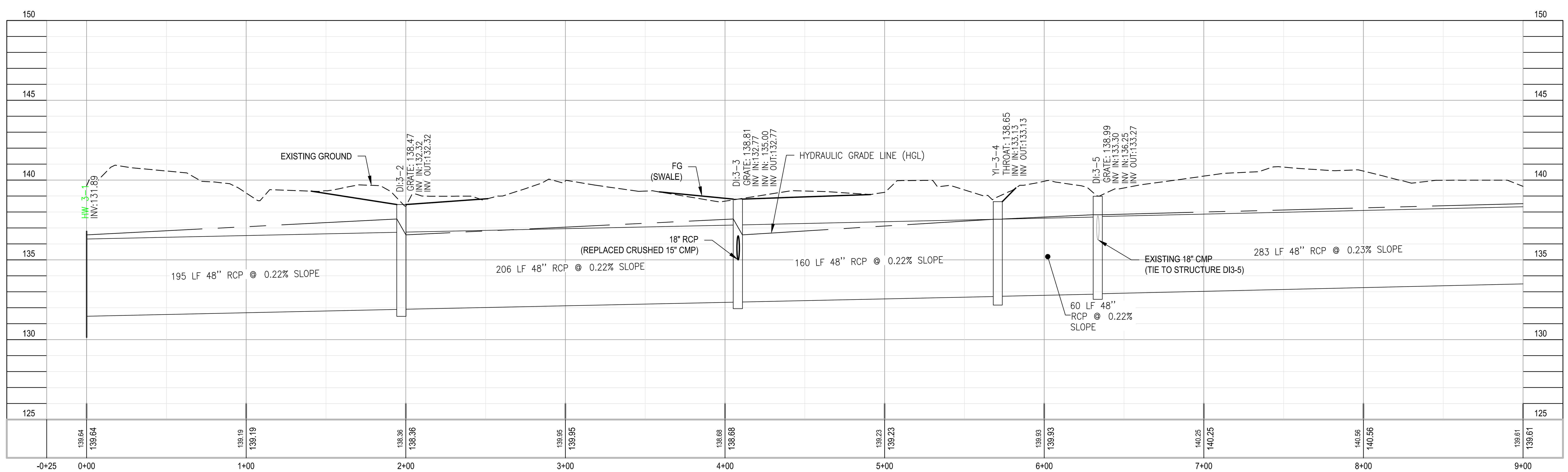
NOTE:

1. CONTRACTOR TO REMOVE EXISTING PIPES AND BOXES WHERE INDICATED.



TRUNKLINE 3

SCALE: 1" = 40'



TL3 PROFILE

SCALE: HORIZ. 1"=40'
VERT. 1"=4'

BID DOCUMENTS

THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION

Filename: L:\LEGACY\2285SR-C87001\CAE\INTEROFFICE\60591852_SUMTER CROSSWELL STORMWATER\900-WORK\910-DRAWINGS\PHASE 1\SHEETS\60591852_C-04 PLAN & PROFILE (DANCONA DR).DWG

AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT

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REGISTRATION

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 35317 JASON EARL OUTLAW
March 28, 2024

SOUTH CAROLINA AECOM TECHNICAL SERVICES, INC. No. 1473 CERTIFICATE OF AUTHORIZATION

ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	03/28/2024	FOR BID

KEY PLAN

PROJECT NUMBER

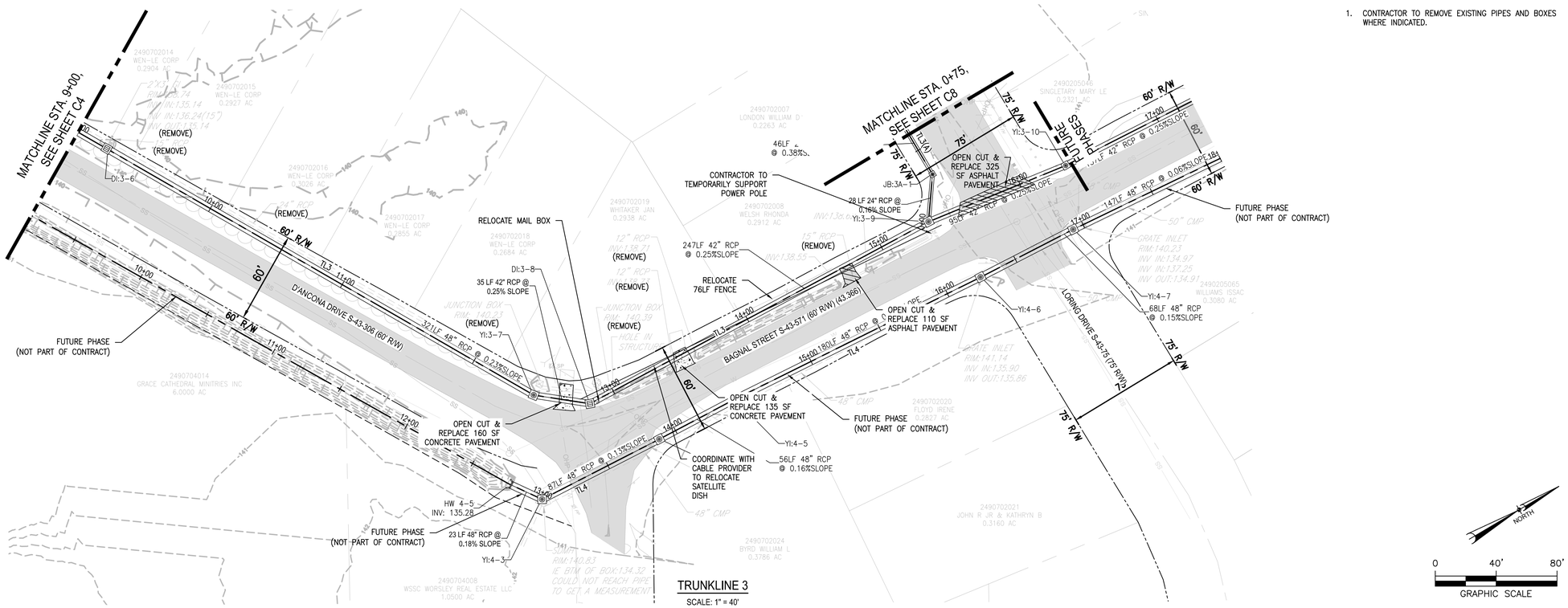
60591852

SHEET TITLE

D'ANCONA DR. TRUNKLINE PLAN & PROFILE

SHEET NUMBER

C4

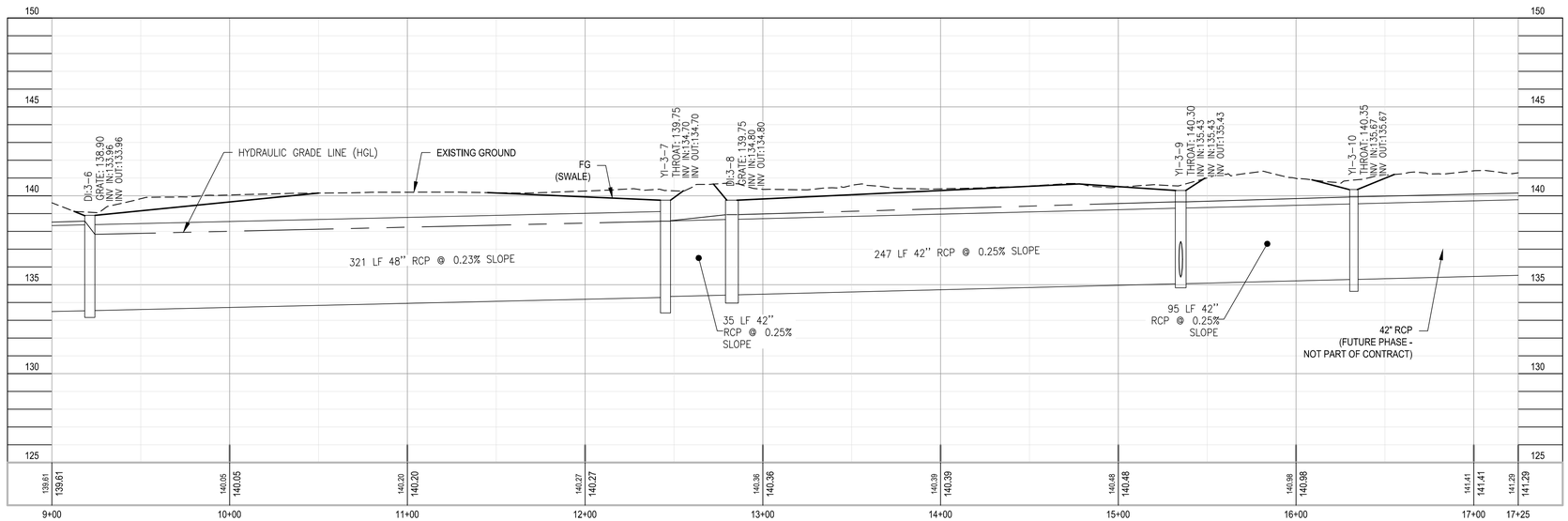


TRUNKLINE 3

SCALE: 1" = 40'

NOTE:

1. CONTRACTOR TO REMOVE EXISTING PIPES AND BOXES WHERE INDICATED.



TL3 PROFILE

SCALE: HORIZ. 1"=40'
VERT. 1"=4'

BID DOCUMENTS

THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION

AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT

CITY OF SUMTER
303 EAST LIBERTY STREET
SUMTER, SOUTH CAROLINA, 29150
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CONSULTANT

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803.254.4400 TEL 803.771.6675 FAX
WWW.AECOM.COM

REGISTRATION

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER
No. 35317
JASON EARL OUTLAW
March 28, 2024

AECOM TECHNICAL SERVICES, INC.
No. 1473
CERTIFICATE OF AUTHORIZATION
SOUTH CAROLINA

ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	03/28/2024	FOR BID

KEY PLAN

PROJECT NUMBER

60591852

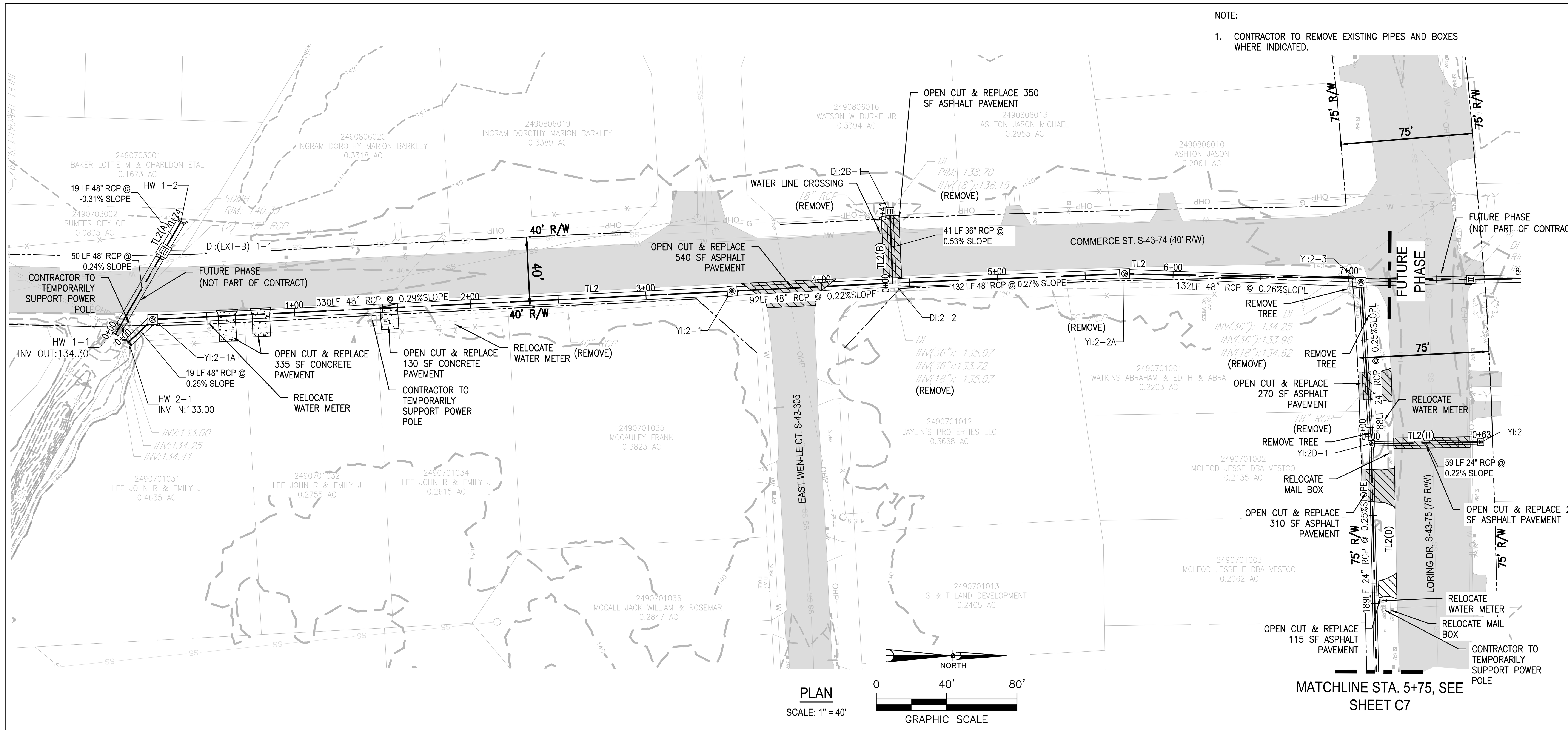
SHEET TITLE

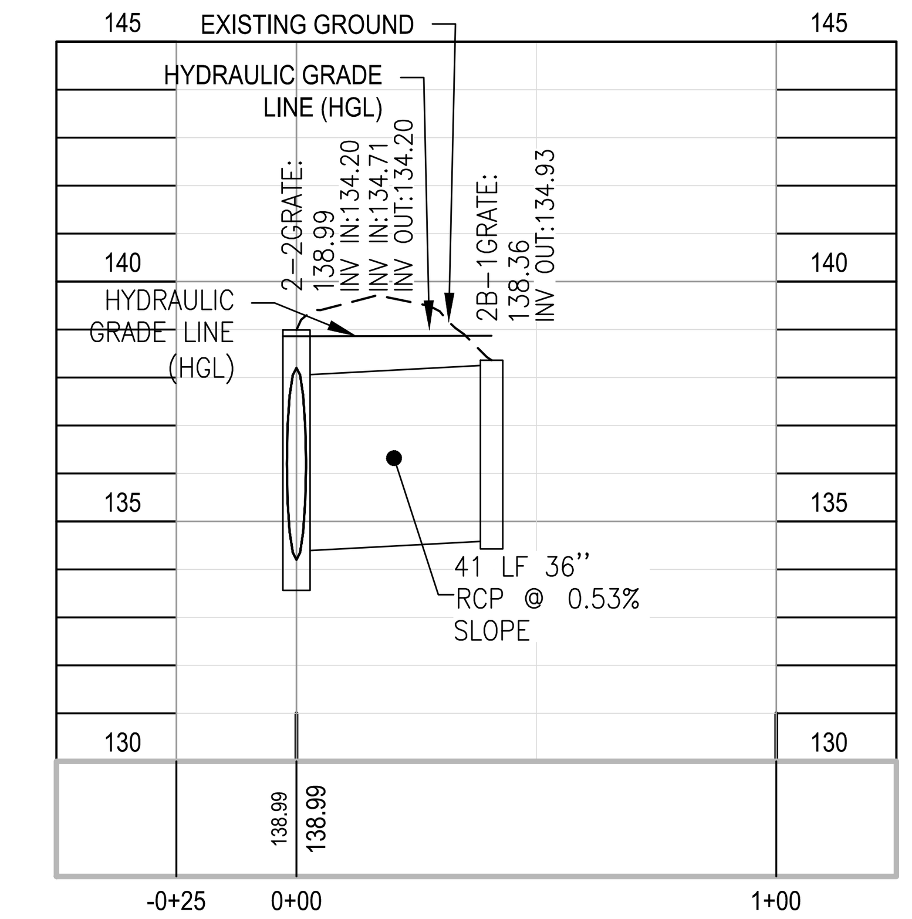
D'ANCONA DR. & BAGNAL ST. TRUNKLINE PLAN & PROFILE

SHEET NUMBER

C5

Filename: L:\LEGACY\2285SR-C87001\CAE\INTEROFFICE\60591852_SUMTER CROSSWELL STORMWATER\900-WORK\910-DRAWINGS\PHASE 1\SHEETS\60591852_C-05 PLAN & PROFILE (DANCONA-BAGNAL ST).DWG





TL2(B) PROFILE

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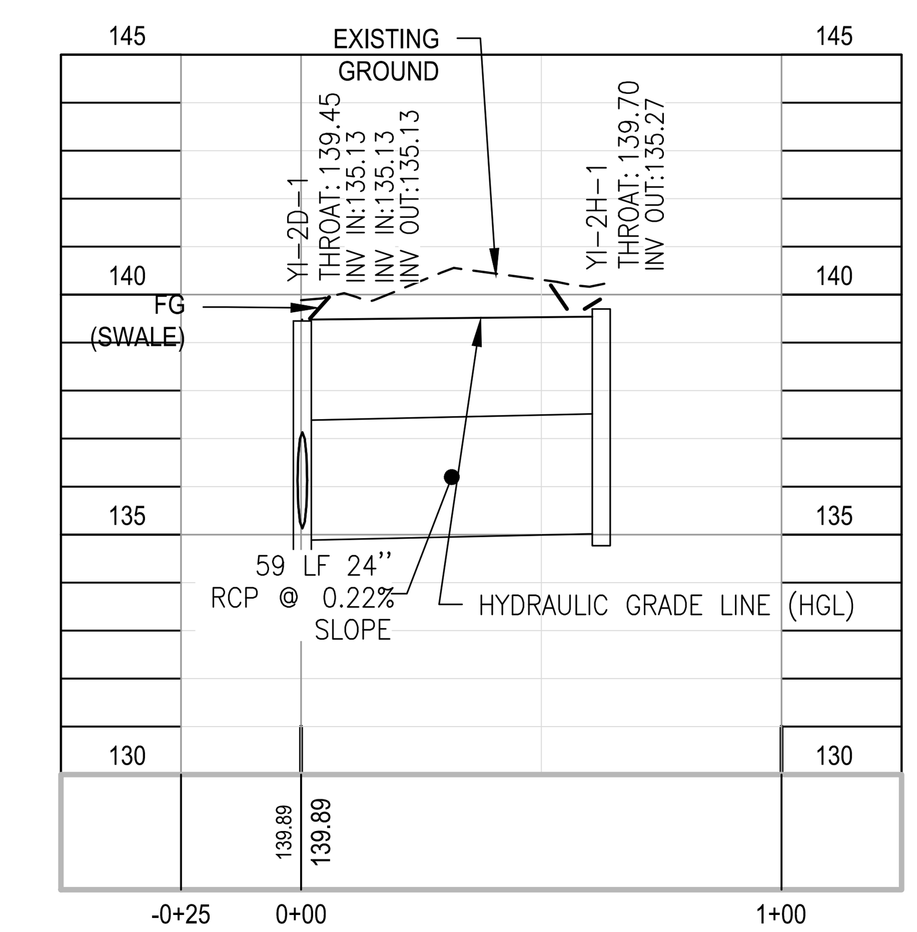
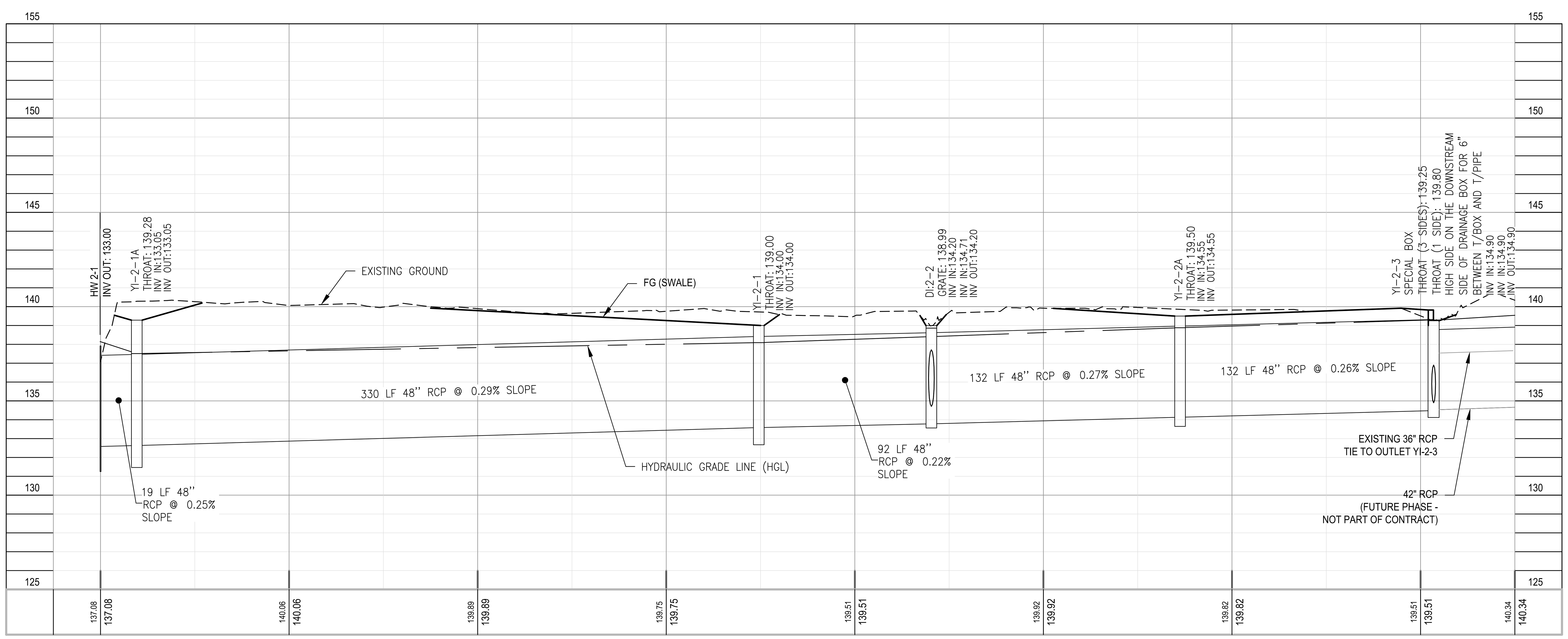
VERT. 1"=4'



TL2(H) PROFILE

SCALE: HORIZ. 1"=40'
VERT. 1"=4'



TL2 PROFILE

SCALE: HORIZ. 1"=40'
VERT. 1"=4'

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AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT

CITY OF SUMTER
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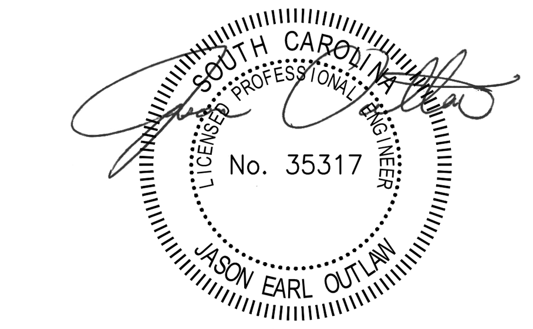
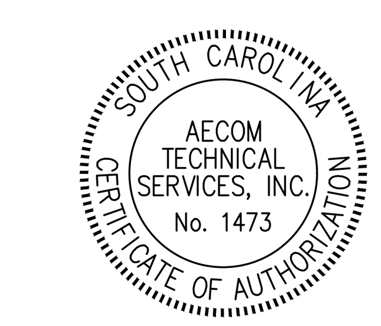
CONSULTANT

AECOM
101 RESEARCH DRIVE
COLUMBIA, SOUTH CAROLINA, 29203
803.254.4400 TEL 803.771.6675 FAX
WWW.AECOM.COM

REGISTRATION



March 28, 2024



ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	03/28/2024	FOR BID

KEY PLAN

PROJECT NUMBER

60591852

SHEET TITLE

COMMERCE ST. TRUNKLINE PLAN & PROFILES

SHEET NUMBER

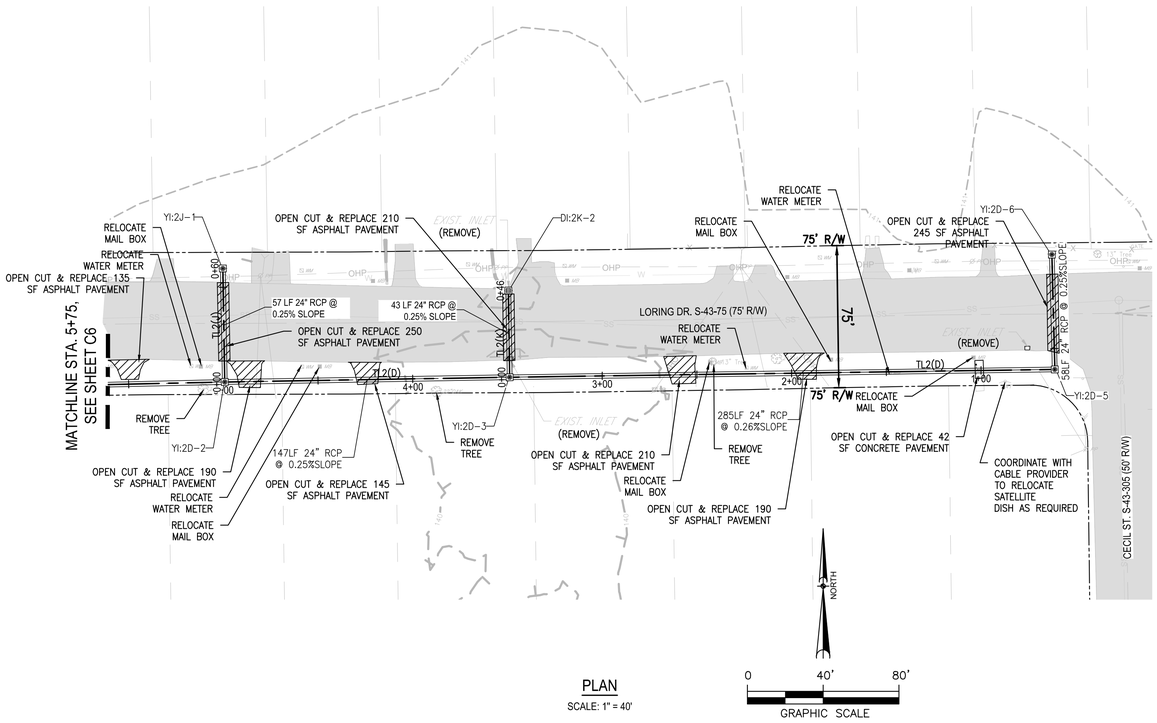
C6

BID DOCUMENTS

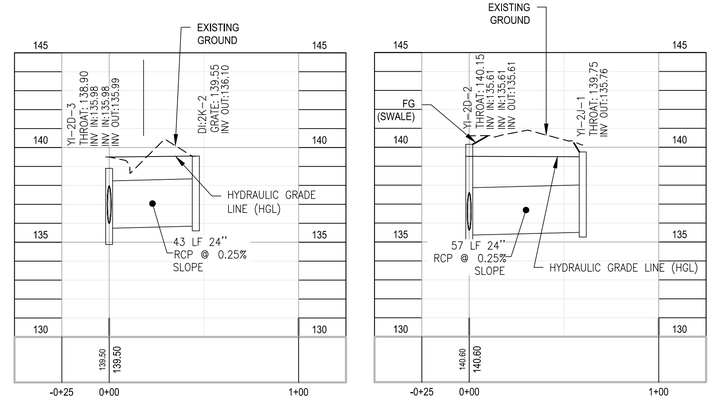
THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION

NOTE:

1. CONTRACTOR TO REMOVE EXISTING PIPES AND BOXES WHERE INDICATED.

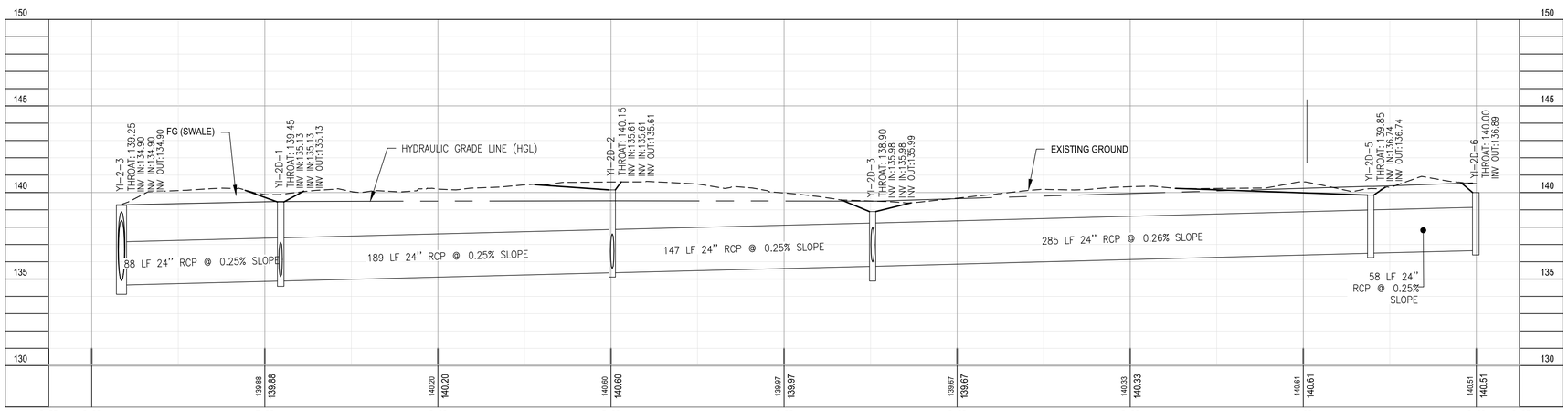


PLAN
SCALE: 1" = 40'



TL2(K) PROFILE
SCALE: HORIZ. 1"=40'
VERT. 1"=4'

TL2(J) PROFILE
SCALE: HORIZ. 1"=40'
VERT. 1"=4'



TL2(D) PROFILE
SCALE: HORIZ. 1"=40'
VERT. 1"=4'

BID DOCUMENTS

THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION

AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT

CITY OF SUMTER
303 EAST LIBERTY STREET
SUMTER, SOUTH CAROLINA, 29150
TEL: 803.436.2558

CONSULTANT

AECOM
101 RESEARCH DRIVE
COLUMBIA, SOUTH CAROLINA, 29203
803.254.4400 TEL 803.771.6675 FAX
WWW.AECOM.COM

REGISTRATION

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER
No. 35317
JASON EARL OUTLAW
March 28, 2024

AECOM TECHNICAL SERVICES, INC.
No. 1473
CERTIFICATE OF AUTHORIZATION
SOUTH CAROLINA

ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	03/28/2024	FOR BID

KEY PLAN

PROJECT NUMBER

60591852

SHEET TITLE

LORING DR. (WEST)
TRUNKLINE PLAN & PROFILES

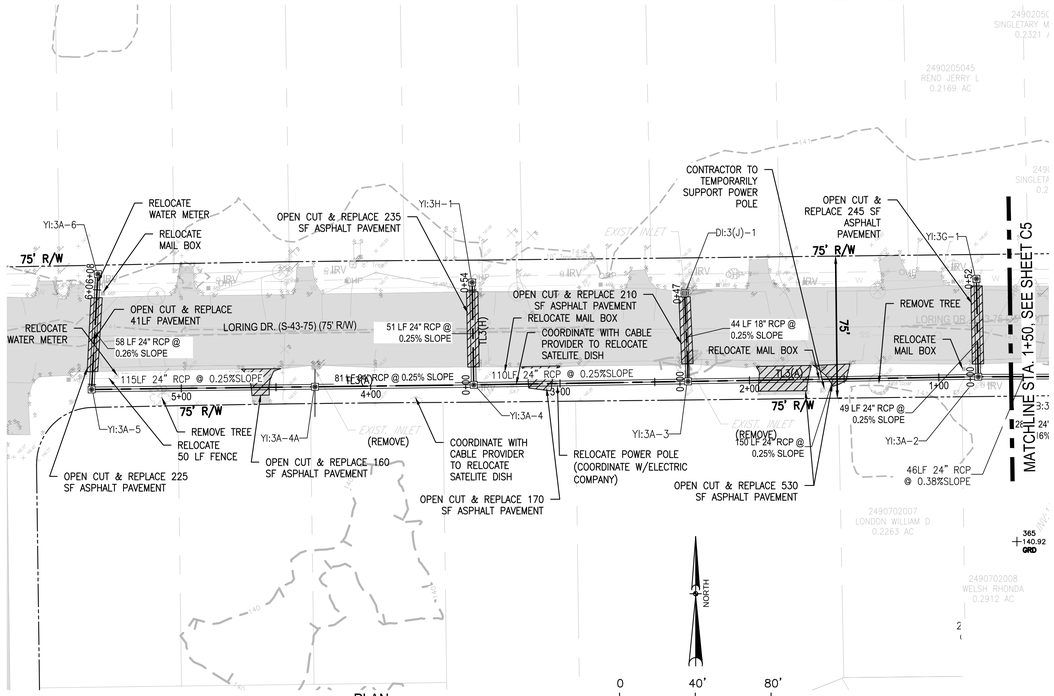
SHEET NUMBER

C7

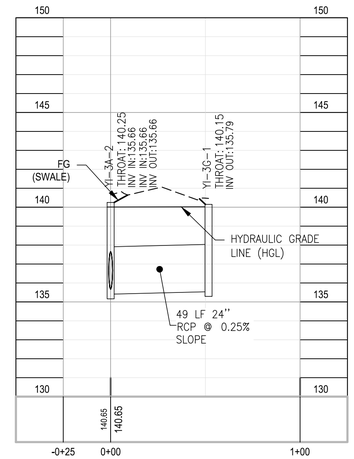
Filename: L:\LEGACY\2285SR-C87001\CAE\INTEROFFICE\60591852_SUMTER CROSSWELL STORMWATER\900-WORK\910-DRAWINGS\PHASE 1\SHEETS\60591852_C-07 PLAN & PROFILE (LORING).DWG

NOTE:

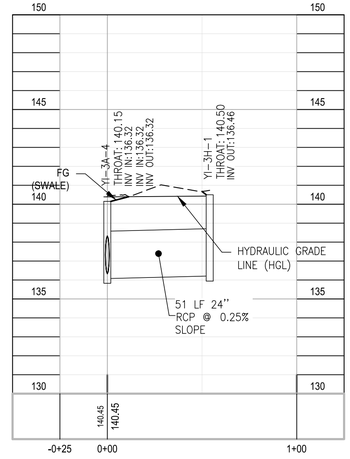
1. CONTRACTOR TO REMOVE EXISTING PIPES AND BOXES WHERE INDICATED.



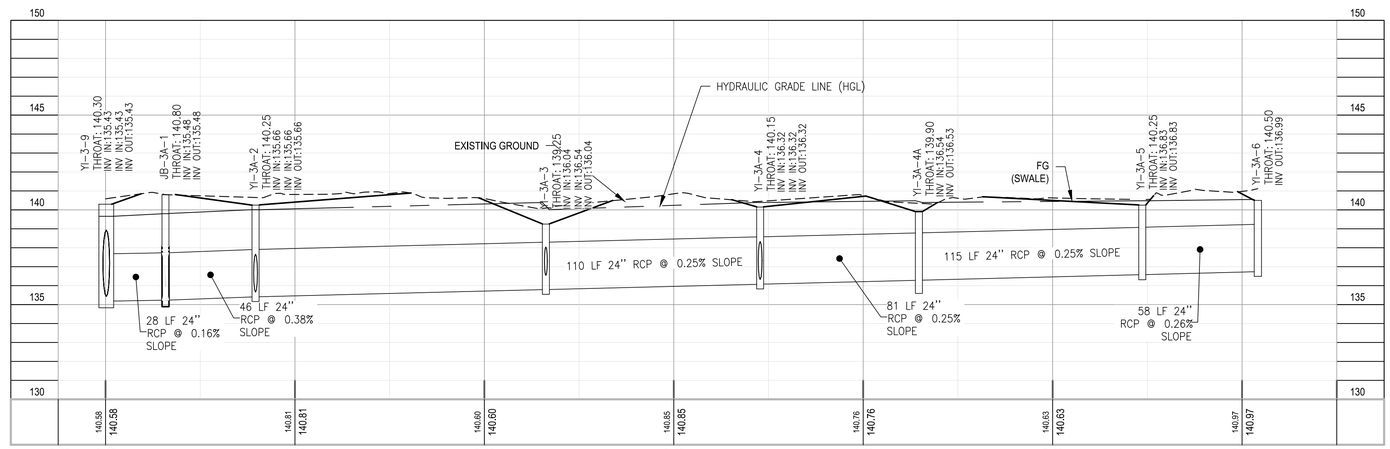
PLAN
SCALE: 1" = 40'



TL3(G) PROFILE
SCALE: HORIZ. 1"=40'
VERT. 1"=4'



TL3(H) PROFILE
SCALE: HORIZ. 1"=40'
VERT. 1"=4'



TL3(A) PROFILE
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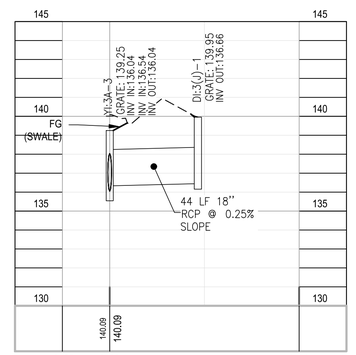
VERT. 1"=4'



TL3(J) PROFILE
SCALE: HORIZ. 1"=40'
VERT. 1"=4'

BID DOCUMENTS

THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION

AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT

CITY OF SUMTER
303 EAST LIBERTY STREET
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REGISTRATION

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER
No. 35317
JASON EARL OUTLAW
March 28, 2024

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION
AECOM TECHNICAL SERVICES, INC.
No. 1473

ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	03/28/2024	FOR BID

KEY PLAN

PROJECT NUMBER

60591852

SHEET TITLE

LORING DR. (EAST)
TRUNKLINE PLAN & PROFILES

SHEET NUMBER

C8

Filename: L:\LEGACY\229SSR-C87001CAE\INTEROFFICE\60591852_SUMTER CROSSWELL STORMWATER\900-WORK\910-DRAWINGS\PHASE 1\SHEETS\60591852_C-08 PLAN & PROFILE (LORING).DWG

SCDOT STANDARD NOTES

1. THERE CAN BE NO WORK PERFORMED IN THE SCDOT R/W BEFORE AN ENCROACHMENT PERMIT HAS BEEN ISSUED AND A PRECONSTRUCTION MEETING HAS BEEN HELD. THE PROPERTY OWNER AND CONTRACTOR MUST SCHEDULE AND ATTEND THE PRECONSTRUCTION MEETING.
2. ANY WORK PERFORMED BEFORE THE PRECONSTRUCTION MEETING WILL HAVE TAKEN PLACE WITHOUT SCDOT KNOWLEDGE, OVERSIGHT, AND CONSENT AND SHALL BE SUBJECT TO REMOVAL BY THE APPLICANT AND/OR AT THE APPLICANT'S EXPENSE.
3. ANY REVISIONS TO THIS APPROVED PLAN SET MUST HAVE PRIOR, WRITTEN APPROVAL FROM SCDOT OR ARE SUBJECT TO REMOVAL AT THE APPLICANT'S EXPENSE.
4. THE CONSTRUCTION ENTRANCE MUST BE ESTABLISHED AT THE LOCATION DESIGNATED IN THIS PLAN SET AND ACCORDING TO SCDOT TYPICAL 815-505-00. NO ADDITIONAL ENTRANCES OR LOCATIONS OTHER THAN SHOWN IN THIS PLAN SET ARE ALLOWED WITHOUT WRITTEN NOTICE FROM SCDOT. APPROVED CONSTRUCTION ENTRANCE SHALL BE INSTALLED PROPERLY AND SHALL BE MAINTAINED AT ALL TIMES. KEEP ROADWAY PROTECTED AND SWEPT OFF AT ALL TIMES. ANY ADDITIONAL, EXISTING DRIVEWAYS OR CONSTRUCTION ENTRANCES, IF ANY, SHALL BE REMOVED FROM SCDOT RIGHT OF WAY AT NO EXPENSE TO SCDOT.
5. NO DEWATERING ACTIVITIES SHALL BE PERFORMED WITHIN SCDOT R/W OR BRING FORTH WATER TO THE SCDOT RIGHT OF WAY BY DIRECT OR INDIRECT METHODS.
6. POST DEVELOPMENT STORMWATER FLOWS TO THE SCDOT R/W CANNOT EXCEED PREDEVELOPMENT FLOW RATES AT ANY TIME FOR ANY REASON.
7. THE APPLICANT IS SOLELY RESPONSIBLE FOR REPAIRS OF ANY AND ALL DAMAGE TO THE TRAVEL WAY DUE TO ANY WORK ALONG THE FRONTAGE OF THIS SITE, AT NO EXPENSE TO SCDOT AND ALL REPAIRS MUST MEET CURRENT SCDOT STANDARDS.
8. ANY DAMAGE TO THE TRAVEL LANE WILL REQUIRE A FULL DEPTH ASPHALT PATCH AND TOTAL ROADWAY (ALL ADJACENT TRAVEL LANES) ASPHALT OVERLAY. PATCHES LARGER THAN A FEW SQUARE FEET OR EXTENDING PAST 1 FOOT INTO THE TRAVEL LANE SHALL REQUIRE AN OVERLAY OF THE ENTIRE WIDTH OF THE EXISTING TRAVEL WAY FOR 50 FEET BEYOND EACH SIDE OF THE FULL DEPTH PATCH. ALL OF THIS WORK WILL BE SOLELY AT THE EXPENSE OF THE APPLICANT AND MUST MEET CURRENT SCDOT STANDARDS.
9. BEFORE INSTALLATION OF ANY NEW DRIVEWAY, THE EXISTING TRAVEL EDGE MUST BE SAW CUT TO PROVIDE A STRAIGHT AND UNIFORM EDGE ALONG THE MOUTH OF THE PROPOSED DRIVEWAY. CARE MUST BE TAKEN TO NOT TO DAMAGE THE EDGE ONCE CUT. ANY DAMAGE TO THE TRAVEL LANE MUST BE REPAIRED AT THE APPLICANT'S EXPENSE.
10. PAVEMENT SECTION IN THE SCDOT R/W SHALL BE, AT A MINIMUM:

    a. 6 INCHES OF COMPACTED GABC

    b. 4 INCHES OF COMPACTED TYPE B BINDER COURSE HOT MIX ASPHALT

    c. 2 INCHES OF COMPACTED TYPE B SURFACE COURSE HOT MIX ASPHALT

    SEE SCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION FOR SURFACE COURSE HOT MIX ASPHALT INSTALLATION TIME AND TEMPERATURE RESTRICTIONS AND THERMO PLASTIC TIME AND TEMPERATURE RESTRICTIONS.

    OR

    d. 8 INCHES OF COMPACTED GABC

    e. 4 INCHES OF 4,000 PSI CONCRETE

    NO REINFORCEMENT WIRE, REBAR, OR METAL OF ANY KIND IS PERMITTED
11. DRIVEWAY LANES SHALL BE A MINIMUM OF 12 FEET IN WIDTH MEASURED FROM EDGE TO EDGE OF ASPHALT.
12. DRIVEWAY RADII SHALL BE 30 FEET. (UNLESS NOTED OTHERWISE ON THE SCDOT APPROVED PLANS.)
13. PAVEMENT MARKINGS SHALL BE THERMOPLASTIC WITH REFLECTIVE BEADS PER SECTION 627 OF THE SCDOT STANDARD SPECIFICATIONS:

    a. ALL WHITE MARKINGS SHALL BE 125 MIL MINIMUM THICKNESS

    b. ALL YELLOW MARKINGS SHALL BE 90 MIL MINIMUM THICKNESS
14. ALL PERMANENT SIGNAGE SHALL BE INSTALLED ON BREAKAWAY POSTS PER SCDOT STANDARD DRAWING 651-110-00 AND SHALL HAVE A 7 VERTICAL FOOT CLEARANCE FROM THE GROUND TO THE BOTTOM OF THE SIGN.
15. DRIVEWAYS SHALL BE CONSTRUCTED TO HAVE A MINIMUM OF A 2 FOOT GRASSED SHOULDER ON EACH SIDE OF THE DRIVEWAY THROAT.
16. DITCH SLOPES SHALL BE NO STEEPER THAN 3H:1V.
17. ALL DRIVEWAY CULVERTS SHALL BE INSTALLED AND SEALED ACCORDING TO SCDOT TYPICAL 714-205-01 DETAIL 4 AND 5 WITH AN AASHTO M 315 RUBBER GASKET SEAL, ON PROPER GRADE TO ALLOW FOR POSITIVE STORM WATER FLOW WITHIN THE PIPE AND TO/FROM ADJACENT PIPES/CROSS LINES.
18. ALL CULVERTS INSIDE OF THE SCDOT R/W ARE TO BE INSTALLED WITH BEVELED ENDS PER SCDOT STANDARD DRAWING 719-610-00 AND SEALED PER SCDOT STANDARD DRAWING 714-205-01 AND CANNOT BE COVERED UNTIL AFTER AN INSPECTION BY THE SCDOT INSPECTOR ASSIGNED TO THE PROJECT AT THE REQUIRED SCDOT PRECONSTRUCTION MEETING.
19. LANE CLOSURES ARE REQUIRED FOR ALL WORK WITHIN ONE FOOT OF THE TRAVEL WAY. SEE SCDOT LOCAL MAINTENANCE WORK RESTRICTIONS FOR ADDITIONAL INFORMATION.
20. SHOULDER CLOSURES ARE REQUIRED FOR ALL WORK IN THE SCDOT R/W BEYOND ONE FOOT FROM THE TRAVEL WAY.
21. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SCHEDULE ALL REQUIRED INSPECTIONS IN ADVANCE. IF WORK REQUIRING INSPECTION IS PERFORMED WITHOUT PRIOR NOTICE BEING GIVEN TO SCDOT, THAT INSTALLATION SHALL BE SUBJECT TO REMOVAL AT THE APPLICANT'S EXPENSE. SEVERAL MEANS OF CONTACT WILL BE GIVEN AT THE PRECONSTRUCTION MEETING. FAILURE TO OBTAIN CONTACT IS NOT AN APPROVAL TO PROCEED WITH ANY WORK.
22. NO VEGETATION INSTALLED ON PRIVATE PROPERTY SHALL BLOCK THE SCDOT SIGHT TRIANGES OR SIGHT DISTANCES FOR MOTORISTS INGRESS OR EGRESSING FROM APPROVED DRIVEWAYS AND OR ROADWAY INTERSECTIONS. THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR KEEPING OFFSITE LANDSCAPINGS PROPERLY MAINTAINTED TO IMPROVE ALL SIGHT DISTANCES. THE PROPERTY OWNER SHALL ALSO BE RESPONSIBLE FOR THE REPAIR OF ANY DAMAGES TO SIDEWALK, DRIVEWAY OR ROADWAY, UTILITY, DRAINAGE OR OTHER STRUCTURES DAMAGED DUE TO THE INSTALLATION OR EXISTENCE OF OFFSITE LANDSCAPING.
23. THE DEPARTMENT SHALL NOT BE RESPONSIBLE FOR DAMAGE TO ANY UTILITY STRUCTURES LOCATED WITHIN THE RIGHT-OF-WAY AS A RESULT OF ROUTINE HIGHWAY MAINTENANCE OPERATIONS. THESE STRUCTURES INCLUDE BUT ARE NOT LIMITED TO ARV, METERS, VALVES, MANHOLES, ALL TYPE OF PEDESTALS AND UTILITY LINES (OVERHEAD AND/OR UNDERGROUND). THE APPLICANT SHOULD USE MECHANICAL MOWERS TO CUT AROUND THESE TYPE STRUCTURES TO INCREASE VISIBILITY FOR HIGHWAY MAINTENANCE WORKERS.
24. APPLICANT IS RESPONSIBLE FOR THE INSTALLATION AND SECURING OF ANY VALVE OR MANHOLE RISERS AS NEEDED.
25. THE DEPARTMENT SHALL BE HELD HARMLESS FROM AND AGAINST ANY AND ALL CLAIMS, DAMAGES AND LOSSES ASSOCIATED WITH WORK AS APPROVED UNDER THIS PERMIT APPLICATION. ANY SUCH DAMAGE CLAIMS RECEIVED BY THE DEPARTMENT SHALL BE THE RESPONSIBILITY OF THE APPLICANT TO PROCESS ACCORDINGLY. THE HOLD HARMLESS AGREEMENT SHALL BE FOR THE LIFE OF THE FACILITY, STRUCTURE(S) OR ENCROACHMENT AS IT REMAINS WITHIN PUBLIC RIGHT-OF-WAY.
26. APPLICANT IS RESPONSIBLE FOR THE REPAIR OF ANY TRAFFIC SIGNAL LOOPS/WIRES/HEAD/CABINETS IF DAMAGED DUE TO THIS INSTALLATION. ALL WORK SHALL BE APPROVED UNDER THE DIRECTION OF THE SCDOT DISTRICT SIGNAL SHOP AND PERFORMED BY A SCDOT APPROVED SIGNAL CONTRACTOR, AT NO EXPENSE TO THE DEPARTMENT.
27. IF REQUIRED UNDER THE APPROVED SCDOT ENCROACHMENT PERMIT, A THIRD PARTY TESTER SHALL BE REQUIRED AT THE APPLICANT'S EXPENSE TO PERFORM COMPACTION ANALYSIS AND WITNESS A PASSING PROOF ROLL ON ALL SUB-GRADE, BASE, AND ASPHALT. ONE THIRD PARTY INSPECTOR SHALL TAKE DENSITY READINGS AT RANDOM STATION NUMBERS. A SECOND (2^{ND}) THIRD PARTY INSPECTOR/TESTER SHALL BE AT THE ASPHALT PLANT TESTING THE ASPHALT AT THE TIME THAT SURFACE ASPHALT IS BEING PRODUCED AND PUT DOWN ON THE JOB. ONE CORE SAMPLE (LOCATIONS TO BE DETERMINED) SHALL BE TAKEN AND WEIGHED BY THE THIRD PARTY INSPECTOR. ALL RESULTS TO BE SUBMITTED IN WRITING TO SCDOT FOR REVIEW THE FOLLOWING DAY. WINTER WORK RESTRICTIONS AND HOLIDAY WORK RESTRICTIONS MUST BE ADHERED TO. SEE PERMIT FOR MORE DETAILS.
28. AN INSPECTION DATE SHALL BE SET UP IN ADVANCE FOR WHICH THE INSPECTOR WILL COME OUT AND INSPECT THE SIDEWALK FORMS BEFORE POURING CONCRETE. DO NOT LEAVE MORE THAN A 2" DROP OFF UNATTENDED. NO MORE THAN A 2" DROP OFF OR A 3:1 DITCH SLOPE IS PERMITTED ANYWHERE WITHIN THE RIGHT OF WAY DUE TO THE CONSTRUCTION ASSOCIATED WITH THIS SIDEWALK. THE INSTALLATION OF SIDEWALK SHALL BE FLUSH WITH SHOULDER OR HAVE A DRAINAGE INLET BUILT UNDERNEATH TO ALLOW FOR PROPER STORM WATER FLOW. NO WATER SHALL POND IN SHOULDER, ROADWAY, DRIVEWAYS, OR RIGHT OF WAY DUE TO THIS INSTALLATION.
29. ADA MATS (RAISED DETECTABLE WARNING PADS) SHALL BE INSTALLED AS WET INSETS AND AT ROADWAY INTERSECTIONS ONLY.
30. NO VALVES OR OTHER APPURTENANCES IN ROADWAY ASPHALT, WITHIN 5 FEET OF EDGE OF PAVEMENT, OR WITHIN DITCH LINE OR SWALE LINE. APPLICANT SHALL INSTALL 8-16 FEET OF NEW, UNDAMAGED RCP ON PROPER GRADE, FACING THE PROPER DIRECTION, MATCHING THE DIAMETER OF DRIVEWAY AND/OR CROSS LINE UPSTREAM, BUT NOT EXCEEDING THE PIPE DIAMETER DOWNSTREAM, IF THE ABOVE CANNOT BE AVOIDED. INSTALL RIP RAP AROUND ANY EXPOSED PIPES, COVER AND SOD TO MEET SCDOT MINIMUM STANDARDS. CALL SCDOT ENCROACHMENT OFFICE FOR INSPECTION OF PIPE BEFORE COVERING.
31. PROPOSED UTILITY INSTALLATION LOCATED IN SHOULDER AREA SHALL HAVE A MINIMUM COVER OF 42" ACCORDING TO FIGURE 6 OF APPENDIX B. ANY EXPOSED ROOTS TO BE REMOVED OR TRIMMED FLUSH WITH SHOULDER/DITCH.

TRAFFIC CONTROL

1. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL IN ACCORDANCE WITH SCDOT STANDARD DRAWING DETAILS 610-205-00, 610-005-10, & 610-005-30.

BID DOCUMENTS

THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION

AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT

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REGISTRATION

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 35317 JASON EARL OUTLAW

March 28, 2024

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION AECOM TECHNICAL SERVICES, INC. No. 1473

ISSUE/REVISION

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1	03/28/2024	FOR BID

KEY PLAN

PROJECT NUMBER

60591852

SHEET TITLE

SCDOT STANDARD NOTES

SHEET NUMBER

C9

Filename: L:\LEGACY\22855R-C87001\CAE\INTEROFFICE\60591852_SUMTER CROSSWELL STORMWATER\900-WORK\910-DRAWINGS\PHASE 1\SHEETS\60591852_DETAILS.DWG

REFERENCES

NATIONAL DOCUMENTS

ASTM C890, ASTM A706, ASTM C913, AASHTO M55, AASHTO M221, AASHTO M199

SCDOT DOCUMENTS

QUALIFIED PRODUCT LIST 14

RELATED DRAWINGS & KEYWORDS

719-315-00, 719-420-00, 719-550-00

PRECONSTRUCTION SUPPORT ENGINEER

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER NO. 8858 EDWIN SYLVESTER EARGLE, II

SIGNATURE

MARCH 3, 2008

DATE

#	DATE	CHK	DESCRIPTION
6			
5			
4			
3			
2			
1			
0	3/2008	DSO	GENERAL REVISIONS

SCDOT

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

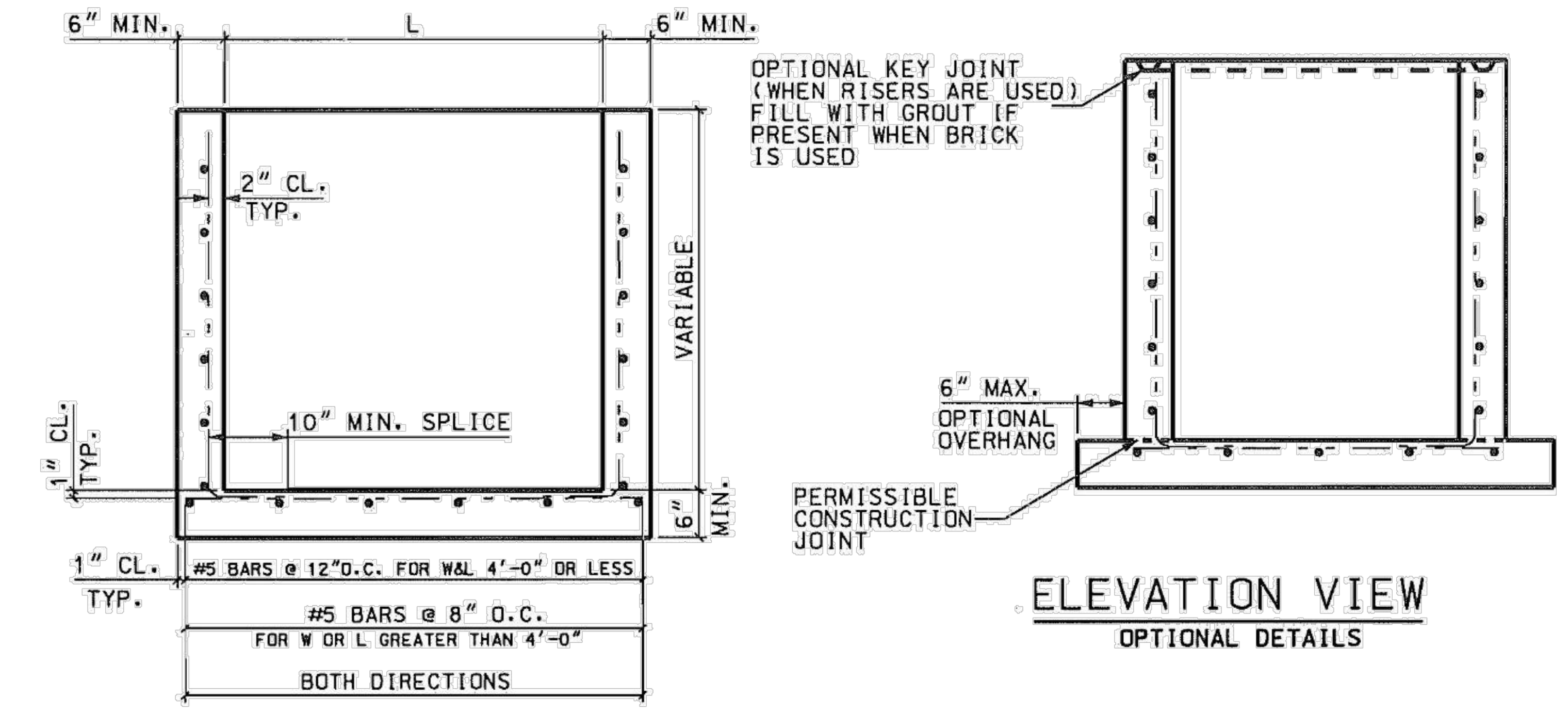
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 405
COLUMBIA, SC 29201

STANDARD DRAWING

DRAINAGE SUBSTRUCTURE RECTANGULAR (PRECAST SOLID WALL BOX)

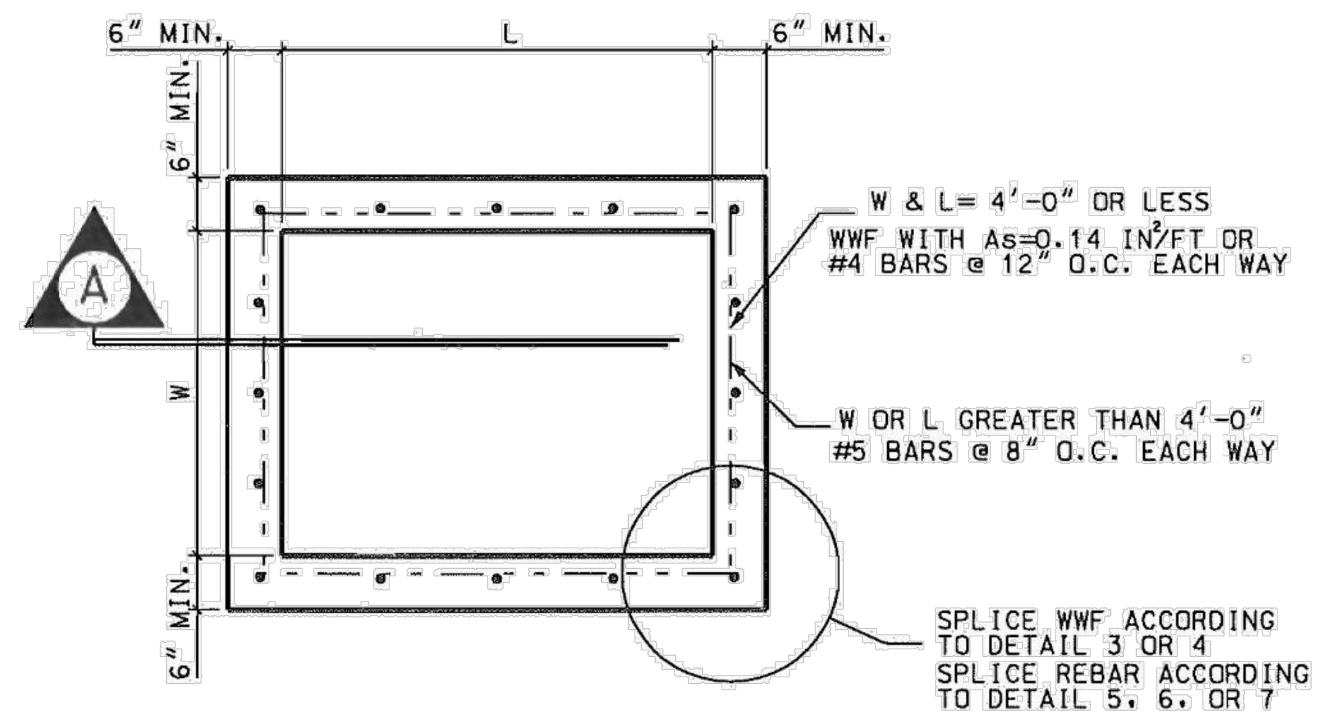
719-305-00

EFFECTIVE LETTING DATE MAY 2008



SECTION (A)
FRONT ELEVATION

ELEVATION VIEW
OPTIONAL DETAILS



PLAN VIEW
PRECAST BOX

TABLE 719-305A		
STANDARD BOX SIZE (WXLXH)	SUGGESTED MAX. PIPE OUTSIDE DIA. (OD) SEE 714	MAX. HOLE DIA. IN (LONG SIDE OF BOX) (HD)
2'x2'x2'	23"	24"
2'x2'x3'	23"	24"
2'x2'x4'	23"	24"
2'x2'x5'	23"	24"
2'x2'x6'	23"	24"
2'x3'x2'	23"	24"
2'x3'x3'	35"	36"
2'x3'x4'	35"	36"
2'x3'x5'	35"	36"
2'x3'x6'	35"	36"
2'x4'x2'	23"	24"
2'x4'x3'	35"	36"
2'x4'x4'	47"	48"
2'x4'x5'	47"	48"
2'x4'x6'	47"	48"
3'x3'x2'	23"	24"
3'x3'x3'	35"	36"
3'x3'x4'	35"	36"
3'x3'x5'	35"	36"
3'x3'x6'	35"	36"
3'x4'x2'	23"	24"
3'x4'x3'	35"	36"
3'x4'x4'	47"	48"
3'x4'x5'	47"	48"
3'x4'x6'	47"	48"
3'x5'x2'	23"	24"
3'x5'x3'	35"	36"
3'x5'x4'	47"	48"
3'x5'x5'	58"	60"
3'x5'x6'	58"	60"
3'x6'x2'	23"	24"
3'x6'x3'	35"	36"
3'x6'x4'	47"	48"
3'x6'x5'	58"	60"
3'x6'x6'	72"	72"
4'x4'x2'	23"	24"
4'x4'x3'	35"	36"
4'x4'x4'	47"	48"
4'x4'x5'	47"	48"
4'x4'x6'	47"	48"
4'x5'x2'	23"	24"
4'x5'x3'	35"	36"
4'x5'x4'	47"	48"
4'x5'x5'	58"	60"
4'x5'x6'	58"	60"
4'x6'x2'	23"	24"
4'x6'x3'	35"	36"
4'x6'x4'	47"	48"
4'x6'x5'	58"	60"
4'x6'x6'	72"	72"
5'x5'x2'	23"	24"
5'x5'x3'	35"	36"
5'x5'x4'	47"	48"
5'x5'x5'	58"	60"
5'x5'x6'	58"	60"
5'x6'x2'	23"	24"
5'x6'x3'	35"	36"
5'x6'x4'	47"	48"
5'x6'x5'	58"	60"
5'x6'x6'	72"	72"
6'x6'x2'	23"	24"
6'x6'x3'	35"	36"
6'x6'x4'	47"	48"
6'x6'x5'	58"	60"
6'x6'x6'	72"	72"
6'x6'x7'	72"	72"

MAX PIPE OUTSIDE DIAMETER=HD-0.5"
TO FIND MAX HOLE DIA. IN SHORT SIDE, FIND SQUARE BOX WITH SAME H
[ie:3'X5'X5' BOX⇒3'X3'X5'⇒HD=36" IN THE 3' SIDE]
[ie:4'X6'X5' BOX⇒4'X4'X5'⇒HD=48" IN THE 4' SIDE]

USE THIS CHART AS A GUIDE FOR PIPE SIZES BEING INSTALLED IN SOLID WALL PRECAST AND BRICK BOXES.

GENERAL NOTES:

1. PRECAST CONCRETE MANUFACTURER MUST HAVE THEIR BOX INCLUDED ON THE DEPARTMENT'S QUALIFIED PRODUCT LIST 14 PRIOR TO FABRICATION. DESIGN CALCULATION AND ENGINEERING DRAWINGS OF EACH SIZE BOX (WXL) MUST BE PREPARED. VARIABLE DEPTHS (H) MAY BE INCLUDED ON THE SAME DRAWING. ENGINEERING DRAWINGS SHOULD BE PROVIDED ON 11"X17" SHEET. DRAWING MUST INCLUDE ALL DIMENSIONS, CLEARANCES, STEEL LAYOUT DETAILS AND CONSTRUCTION NOTES. EACH ENGINEERING DRAWING MUST STATE THE ASTM SPECIFICATION THAT IT MEETS AND ALL MATERIAL SPECIFICATIONS. A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF SOUTH CAROLINA MUST SIGN AND SEAL ALL ENGINEERING DRAWINGS AND DESIGN CALCULATIONS. SUBMITTALS MUST INCLUDE ONE ORIGINAL AND TWO COPIES OF THE DESIGN CALCULATIONS WITH DRAWINGS AS SPECIFIED ABOVE. SEND SUBMITTALS TO THE CONTACT LISTED ON QUALIFIED PRODUCT POLICY 14.

2. PRECAST CONCRETE COMPONENTS FOR DRAINAGE ITEMS AT EACH LOCATION MUST BE SUPPLIED FROM A SINGLE SOURCE PRECAST MANUFACTURER THAT HAS BEEN INSPECTED AND APPROVED BY THE MATERIALS AND RESEARCH ENGINEER.

3. THE PRECAST CONCRETE DRAINAGE BOX MAY BE USED WITH THE FOLLOWING DRAINAGE STRUCTURES:

CATCH BASIN TYPE 1	CATCH BASIN TYPE 17
CATCH BASIN TYPE 1(SPECIAL)	CATCH BASIN TYPE 18
CATCH BASIN TYPE 9 & TYPE 9 MH	DROP INLETS
CATCH BASIN TYPE 12	JUNCTION BOXES
CATCH BASIN TYPE 16	INCLUDING ALL INLET ADAPTORS

4. DESIGN FOR PRECAST DRAINAGE STRUCTURES MUST MEET OR EXCEED ASTM C 890 OR ASTM C 913 AND THE DESIGN REQUIREMENTS SHOWN ON THIS SHEET. ALL DESIGN COMPUTATIONS WILL BE PROVIDED FOR A DEPTH OF 12'-0". A JOINT DESIGN FOR RISERS AND TOP OF BOX MUST ALSO BE PROVIDED.

5. THE BURIAL DEPTH FROM THE TOP OF THE DRAINAGE BOX BOTTOM SLAB TO THE TOP OF THE GROUND SHALL NOT EXCEED 12'-0".

6. DRAWINGS OF PRECAST DRAINAGE BOX WITH SOLID WALLS SHALL INDICATE LOCATION OF CONSTRUCTION JOINTS & ADDITIONAL CONSTRUCTION DETAILS REQUIRED BY THE MANUFACTURER.

7. ONLY THOSE STRUCTURES SIZES (WXLXH) SHOWN IN TABLE 719-305A WILL BE SUBMITTED FOR DESIGN APPROVAL.

8. DURING MANUFACTURING, DRAINAGE BOX SIZES (WXLXH), MAY VARY BETWEEN THE APPROVED DESIGN BOX SIZES. WHEN DRAINAGE BOX SIZE HEIGHT 'H', WIDTH 'W' OR LENGHT'L' FALLS BETWEEN THE APPROVED DESIGN SIZES. THE BOX WITH GREATER SIZES MUST BE USED FOR DESIGN OF THAT BOX. BOX HEIGHT 'H' GREATER THAN THE MAXIMUM APPROVED DESIGN SIZES WILL NOT BE STANDARD.

MATERIAL NOTES:

9. CONCRETE FOR PRECAST STRUCTURES SHALL BE CLASS 4000P MEETING THE REQUIREMENTS OF SECTION 701 OF THE SCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (LATEST EDITION).

10. REINFORCING STEEL SHALL BE ASTM A-706, LOW-ALLOY STEEL DEFORMED BARS FOR CONCRETE REINFORCEMENT, GRADE 60. WIRE MESH SHALL CONFORM TO AASHTO M 55, OR M 221.

DETAIL NOTES:

11. BRICK MASONRY OR CLASS 4000 CONCRETE MAY BE USED TO FINISH THE PORTION ABOVE THE TOP OF THE BOX (2 FT. MAX.) TO BRING TO GRADE OR TO COMPLETE AN INLET STRUCTURE. THESE MATERIALS SHALL CONFORM TO SECTION 719 OF THE SCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (LATEST EDITION).

12. LIFT HOLES AND/OR DEVICES MAY BE PLACED AS NECESSARY. ALL LIFT HOLES SHALL BE GROUTED PRIOR TO COMPLETION OF THE INSTALLATION. ALL LIFTING METHODS MUST MEET OSHA REGULATIONS.

13. FORM OPENINGS FOR PIPE AS REQUIRED TO ACCOMODATE PIPE SIZE AND LOCATION SPECIFIED. ORIENT PRECAST DRAINAGE STRUCTURE SO THAT PIPES ENTER THROUGH THE WALLS. PIPES MAY ENTER THROUGH THE CORNERS OF SOLID WALL BOXES IF A MINIMUM OF 6" OF WALL IS PROVIDED ABOVE THE HOLE TO THE TOP OF THE BOX OR TO ANOTHER OPENING.

14. DURING MANUFACTURING OF THE PRECAST DRAINAGE BOX, THE WALL (FULL THICKNESS) MAY BE EXTENDED A MAXIMUM OF 2 FEET ABOVE THE TOP OF THE BOX TO BRING TO GRADE OR TO COMPLETE AN INLET STRUCTURE. IF THIS OPTION IS TO BE USED, THE SHOP DRAWING SUBMITTAL MUST INCLUDE ALL DIMENSIONS AND DETAILS FOR THESE BOXES. CONTINUE REINFORCEMENT FROM BOX INTO THE EXTENDED HEIGHT.

15. TOP OF WALL SHALL BE CAST WITH A KEY JOINT WHEN PRECAST RISERS ARE USED.

16. THE HEIGHT OF PRECAST DRAINAGE BOX WITH SOLID WALLS CAN BE INCREASED BY USE OF RISERS TO THE REQUIRED DEPTH UP TO A MAXIMUM BURIAL DEPTH OF 12' (SEE STD. 719-315-00).

17. JOINTS SHALL BE SEALED WITH A FLEXIBLE BUTYL OR BITUMINOUS SEALANT CONFORMING TO AASHTO M 199.

18. WHEN BURIAL DEPTH EXCEEDS 4'-6", PLACE STEPS IN ACCORDANCE WITH STANDARD DRAWING NO. 719-550-00.

19. GROUT THE FLOW LINE FROM THE BASE TO THE OUTLET PIPE TO MAINTAIN A CONTINOUS FLOW. GROUT SHALL BE TYPE M MORTAR MATERIAL IN ACCORDANCE WITH SECTION 718 OF THE SCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (LATEST EDITION).

20. THE MINIMUM STEEL REINFORCEMENT REQUIRED FOR ALL BOX SIZES SHALL BE AS SHOWN ON THIS SHEET.

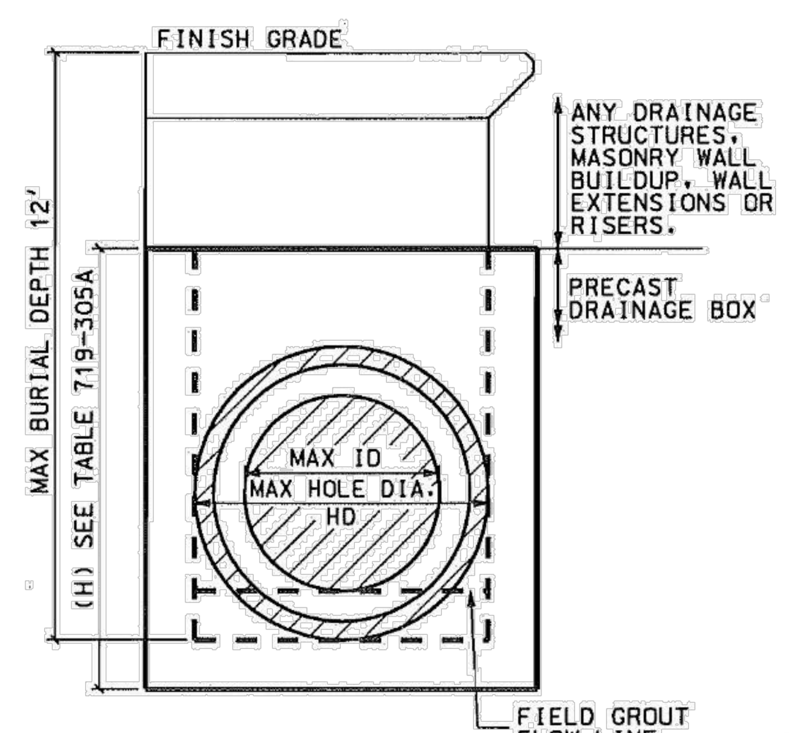
21. PRECAST CONCRETE CIRCULAR STRUCTURES (AS SHOWN ON 719-420-00) ARE REQUIRED FOR THE FOLLOWING APPLICATIONS UNLESS PROHIBITED BY THE PLANS OR SPECIAL PROVISIONS.

(a) ON DRAINAGE STRUCTURES WITH A DEPTH EQUAL TO OR GREATER THAN 12 FEET.

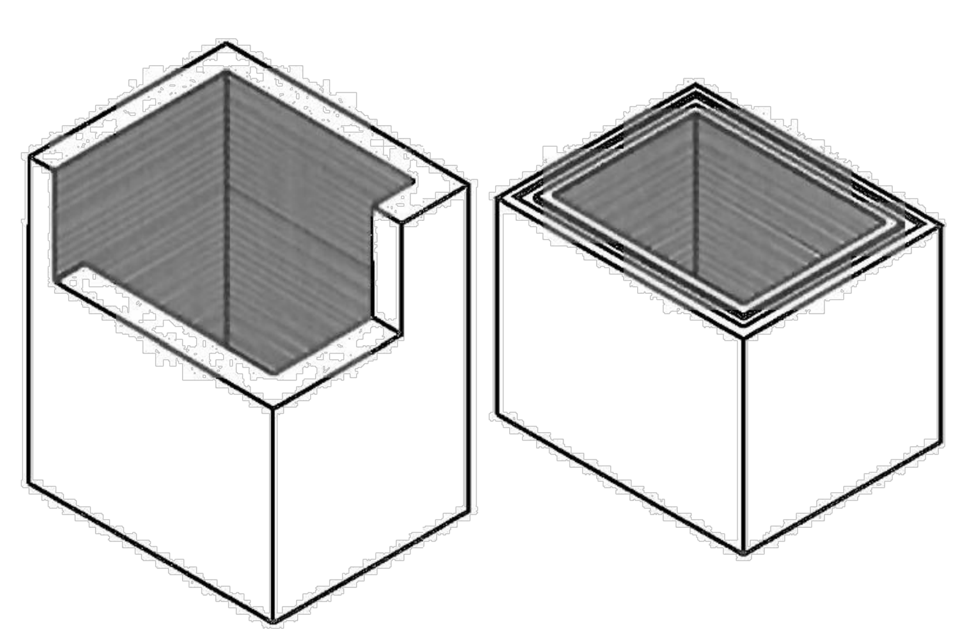
(b) ON DRAINAGE STRUCTURES WHERE THE FLOW LINE ELEVATION OF THE INLET PIPE IS EQUAL TO OR HIGHER THAN THE INSIDE TOP (SOFFIT) OF THE OUTLET PIPE.

(c) AS REQUIRED BY THE PROJECT PLANS.

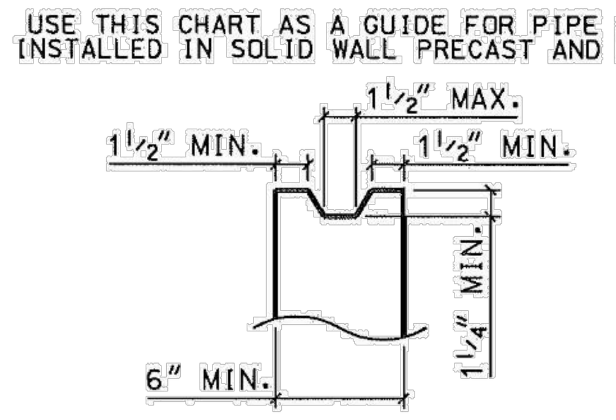
22. PAY ITEM: THESE ITEMS WILL BE PAID FOR IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR THE DRAINAGE STRUCTURE LISTED IN NOTE 3. EXTRA DEPTH BOX WILL BE MEASURED AND PAID FOR AS NOTED IN SECTION 719 OF THE STANDARD SPECIFICATIONS.



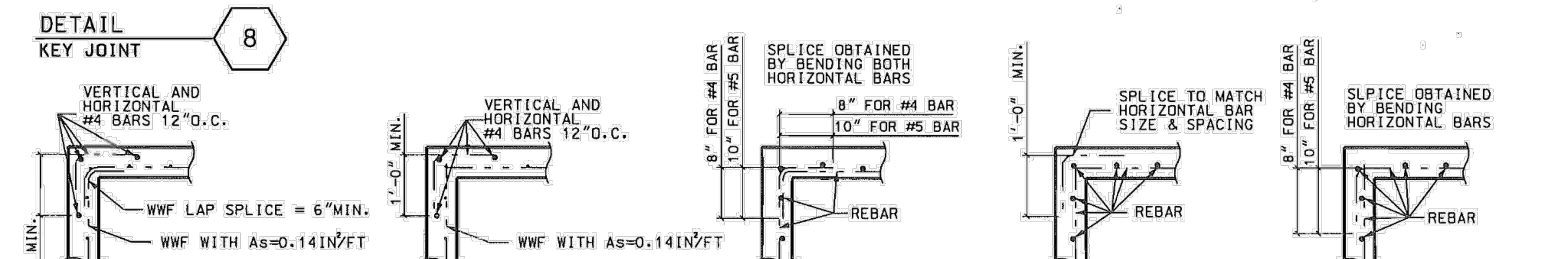
DETAIL (1)
INSTALLED SIDE ELEVATION



DETAIL (2)
ISOMETRIC VIEW



DETAIL (8)
KEY JOINT



DETAIL (3) WWF DETAIL

DETAIL (4) WWF DETAIL

DETAIL (5) REBAR DETAIL

DETAIL (6) REBAR DETAIL

DETAIL (7) REBAR DETAIL

ACCEPTABLE SPLICE OPTIONS

THIS DRAWING IS NOT TO SCALE

STORM DRAINAGE BOX DETAIL

NOT TO SCALE

AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT

CITY OF SUMTER
303 EAST LIBERTY STREET
SUMTER, SOUTH CAROLINA, 29150
TEL: 803.436.2558

CONSULTANT

AECOM
101 RESEARCH DRIVE
COLUMBIA, SOUTH CAROLINA, 29203
803.254.4400 TEL 803.771.6675 FAX
WWW.AECOM.COM

REGISTRATION

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 35317 JASON EARL OUTLAW
March 28, 2024

SOUTH CAROLINA AECOM TECHNICAL SERVICES, INC. No. 1473 CERTIFICATE OF AUTHORIZATION

ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	03/28/2024	FOR BID

KEY PLAN

PROJECT NUMBER

60591852

SHEET TITLE

STORMWATER DETAILS

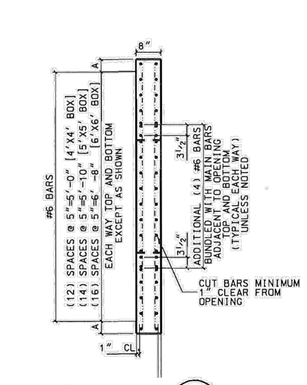
SHEET NUMBER

C10

BID DOCUMENTS

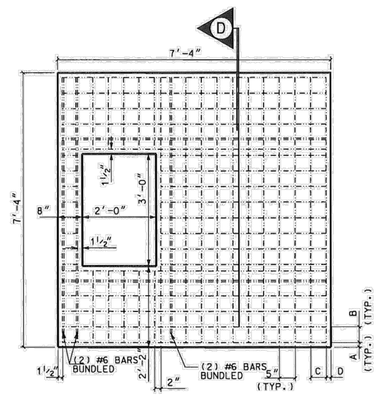
THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION

Filename: L:\LEGACY\22855R-C87001\CAE\INTEROFFICE\60591852_SUMTER CROSSWELL STORMWATER\900-WORK\910-DRAWINGS\PHASE 1\SHEETS\60591852_DETAILS.DWG

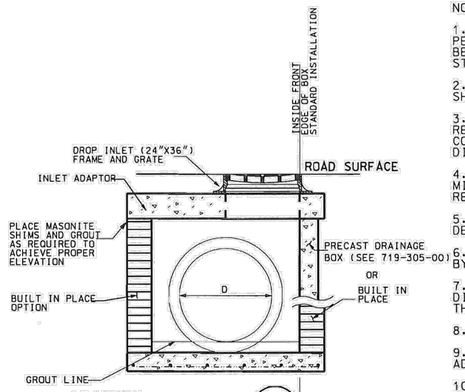


SECTION
SIDE ELEVATION
DROP INLET (24"X36")
INLET ADAPTOR

D

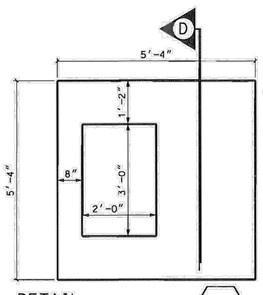


DROP INLET (24"X36") INLET ADAPTER FOR A 6'X6' BOX (88"X88"X8")
PLAN VIEW SHOWING REINFORCING
A=1½"
B=5"
C=5"
D=1½"

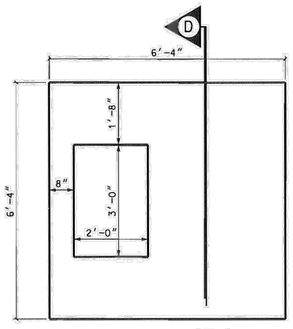


SECTION
SIDE ELEVATION
DROP INLET (24"X36")
INLET ADAPTOR INSTALLED
SEE ALSO 719-105-01

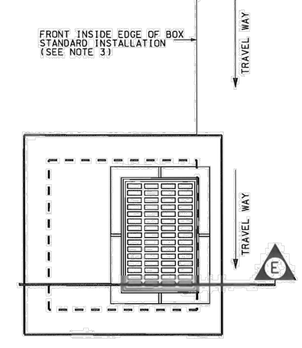
E



DETAIL
DROP INLET (24"X36")
INLET ADAPTOR FOR
4'X4' BOX (64"X64"X8")
2
A=1½"
B=3"
C=5"
D=2½"



DETAIL
DROP INLET (24"X36")
INLET ADAPTOR FOR
5'X5' BOX (76"X76"X8")
3
A=1½"
B=4"
C=3"
D=1½"



DETAIL
INSTALLED
DROP INLET (24"X36")
INLET ADAPTER
4

NOTES:

1. ALL MATERIALS, DESIGN, MANUFACTURING, TESTING AND PRODUCT PERFORMANCE FOR PRECAST CONCRETE COMPONENTS AND ACCESSORIES SHALL BE IN ACCORDANCE WITH AASHTO M 199 AND SECTION 719 OF THE SCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION(LATEST EDITION).

2. FOR PRECAST CONSTRUCTION, A MINIMUM OF CLASS 4000P CONCRETE SHALL BE USED.

3. DROP INLET (24"X36") INLET ADAPTORS ARE DESIGNED TO BE REVERSIBLE AND CAN BE ROTATED UP TO 180 DEGREES TO SATISFY FIELD CONDITIONS. ENGINEER SHALL NOTE BOX POSITION ON FINAL PLANS WHEN DIFFERENT FROM STANDARD.

4. ALL DROP INLET (24"X36") INLET ADAPTOR SLABS ARE TO BE A MINIMUM OF 8 INCHES THICK WITH THE REINFORCING STEEL PLACED RELATIVE TO THE DROP INLET OPENING.

5. REINFORCING STEEL SHALL BE ASTM A-706, LOW-ALLOY STEEL DEFORMED BARS FOR CONCRETE REINFORCEMENT, GRADE 60.

6. USE OF INLET ADAPTOR SLABS ON EXISTING BOXES MUST BE APPROVED BY THE ENGINEER BEFORE INSTALLATION.

7. FOR USE ON NEW BUILT IN PLACE BRICK BOXES THE MAXIMUM OUTSIDE DIMENSIONS OF THE BOX SHALL NOT EXCEED THE OUTSIDE DIMENSIONS OF THE ADAPTOR SLAB.

8. THE ADAPTER SLAB AS SHOWN IS DESIGNED FOR HS 25 LIVE LOAD.

9. CHAIRS ARE TO BE USED TO POSITION THE STEEL MATS IN THE ADAPTOR SLAB.

10. RISERS MUST BE PLACED BETWEEN BOX AND INLET ADAPTOR AND MAY NOT BE PLACED BETWEEN INLET ADAPTOR AND DROP INLET.

11. SEE DRAWING 719-105-01 OF THE STANDARD DRAWINGS FOR DETAILS ON DROP INLETS.

12. SEE SCDOT STANDARD DRAWINGS 719-315-00 AND 719-305-00 FOR APPROPRIATE BOX SIZE BASED ON PIPE DIAMETERS REQUIRED.

13. SUPPLY PRECAST CONCRETE COMPONENTS FOR DRAINAGE ITEMS AT EACH LOCATION FROM A SINGLE SOURCE PRECAST MANUFACTURER THAT HAS BEEN INSPECTED AND APPROVED BY THE MATERIALS AND RESEARCH ENGINEER. SUPPLY ALL INTERCHANGEABLE PRECAST PARTS ON ENTIRE PROJECT FROM A SINGLE SOURCE MANUFACTURER LISTED ON QUALIFIED PRODUCT LIST 14 UNLESS APPROVED BY RCE. ITEMS FROM MULTIPLE MANUFACTURERS SHOULD NOT BE INSTALLED IN INDIVIDUAL LOCATIONS.

14. THE USE OF PRECAST UNITS WILL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF OBTAINING SATISFACTORY INSTALLATIONS. SEE STANDARD DRAWINGS FOR PRECAST CONCRETE DRAINAGE BOX OR STRUCTURE FOR ADDITIONAL DETAILS AND SPECIFICATIONS.

15. LIFT HOLES AND/OR DEVICES MAY BE PLACED AS NECESSARY. ALL LIFT HOLES SHALL BE GROUTED SHUT PRIOR TO COMPLETION OF THE INSTALLATION. ALL LIFTING METHODS MUST MEET OSHA REGULATIONS.

16. THE CONTRACTOR SHALL USE MANUFACTURERS LISTED ON QUALIFIED PRODUCT LIST 14 FOR PRECAST ITEMS ON THIS DRAWING. PRECAST MANUFACTURER SHALL FOLLOW QUALIFIED PRODUCT POLICY 14 BEFORE SUPPLYING THIS ITEM ON SCDOT PROJECTS.

17. CONTRACTOR MAY SUBMIT DESIGN DRAWINGS AND CALCULATIONS FOR MODIFICATIONS TO THIS ITEM ON A PROJECT BY PROJECT BASIS. MODIFICATIONS TO THESE ITEMS WILL NOT BE LISTED ON ANY QUALIFIED PRODUCT LIST. SUBMIT ALL PROPOSALS FOR PROJECT SPECIFIC MODIFICATIONS TO THE RESIDENT ENGINEER FOR REVIEW BY THE ENGINEER OF RECORD.

18. JOINTS BETWEEN INSTALLED PIECES AND PRECAST ITEMS TO BE PLACED SHALL BE SEALED WITH A ½" GROUT LIFT OR AN APPROPRIATE PLASTIC PREFORMED GASKET (FROM QUALIFIED PRODUCT LIST 13.)

19. THE CONTRACT UNIT PRICE FOR DROP INLETS WITH STANDARD BOX SHALL INCLUDE THE COST OF FURNISHING ALL MATERIALS, INCLUDING INLET ADAPTOR, INLET SYSTEM, AND DRAINAGE BOX, AND WORK INCIDENTAL TO THE CONSTRUCTION OF THE STRUCTURE COMPLETE IN PLACE AS SHOWN IN ACCORDANCE WITH THE SCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (LATEST EDITION).

20. PRECAST CONCRETE CIRCULAR STRUCTURES (AS SHOWN ON 719-420-00) ARE REQUIRED FOR THE FOLLOWING APPLICATIONS UNLESS PROHIBITED BY THE PLANS OR SPECIAL PROVISIONS.

(a) ON DRAINAGE STRUCTURES WITH A DEPTH EQUAL TO OR GREATER THAN 12 FEET.

(b) ON DRAINAGE STRUCTURES WHERE THE FLOW LINE ELEVATION OF THE INLET PIPE IS EQUAL TO OR HIGHER THAN THE INSIDE TOP (SOFFIT) OF THE OUTLET PIPE.

(c) AS REQUIRED BY THE PROJECT PLANS.

21. THE PAY ITEM SHALL BE
DROP INLET (24"X36") WITH STANDARD 4'X4' BOX.....EA.
DROP INLET (24"X36") WITH STANDARD 5'X5' BOX.....EA.
DROP INLET (24"X36") WITH STANDARD 6'X6' BOX.....EA.
DROP INLET (24"X36") WITH MODIFIED BOX NO.(_).....EA.

TABLE 719-110D	
STD. DRAWINGS OF INLET ADAPTORS THAT HAVE SIMILAR STRUCTURAL DESIGN	
CB TYPE 1	719-001-04
CB TYPE 9	719-009-04
DI 24"X24"	719-105-02
DI 24"X36"	719-110-02
MANHOLE	719-505-03
JB SHALLOW	719-330-02

TABLE 719-110C PRECAST ITEMS
DROP INLET (24"X36") INLET ADAPTOR FOR 4X4 BOX (64"X64"X8")
DROP INLET (24"X36") INLET ADAPTOR FOR 5X5 BOX (76"X76"X8")
DROP INLET (24"X36") INLET ADAPTOR FOR 6X6 BOX (88"X88"X8")
SEE ALSO 719-105-01, 719-310-00, & 719-305-00

USE SHEETS 719-110-01 THROUGH 719-110-02 FOR THIS ITEM.

THIS DRAWING IS NOT TO SCALE

DROP INLET (DI) DETAIL
NOT TO SCALE

REFERENCES

NATIONAL DOCUMENTS
AASHTO M199, ASTM A706

SCDOT DOCUMENTS
QUALIFIED PRODUCT LIST 14,
QUALIFIED PRODUCT LIST 13

RELATED DRAWINGS & KEYWORDS
719-110-01 TO 719-110-02, 719-001-04, 719-009-04, 719-110-02, 719-420-00, 719-505-03, 719-330-02, 719-105-01, 719-310-00, 719-305-00, 719-315-00

PRECONSTRUCTION SUPPORT ENGINEER

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER
NO. 8858
EDWIN SYLVESTER EAGLE, II

SIGNATURE

MARCH 3, 2008
DATE

#	DATE	CHK	DESCRIPTION
6			
5			
4			
3			
2			
1			
0	3/2008	DSO	GENERAL REVISIONS

SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 405
COLUMBIA, SC 29201

STANDARD DRAWING

DROP INLET
(24"X36")
INLET ADAPTOR

719-110-02

EFFECTIVE LETTING DATE: MAY 2008

BID DOCUMENTS
THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION

AECOM

PROJECT
CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT
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REGISTRATION

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER
No. 35317
JASON EARL OUTLAW
March 28, 2024

SOUTH CAROLINA
AECOM TECHNICAL SERVICES, INC.
No. 1473
CERTIFICATE OF AUTHORIZATION

ISSUE/REVISION

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1	03/28/2024	FOR BID

KEY PLAN

PROJECT NUMBER
60591852

SHEET TITLE
STORMWATER DETAILS

SHEET NUMBER
C11

Filename: L:\LEGACY\228SSR-C87001\CAE\INTEROFFICE\60591852_SUMTER CROSSWELL STORMWATER\900-WORK\910-DRAWINGS\PHASE 1\SHEETS\60591852_DETAILS.DWG

REFERENCES

NATIONAL DOCUMENTS

AASHTO M235

SCDOT DOCUMENTS

QUALIFIED PRODUCT LIST 14

RELATED DRAWINGS & KEYWORDS

719-310-00, 719-305-00, 719-009-01 TO 719-009-05

PRECONSTRUCTION SUPPORT ENGINEER

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER NO. 8858 EDWIN SYLVESTER EAGLE, III

SIGNATURE

MARCH 3, 2008

DATE

#	DATE	CHK	DESCRIPTION
6			
5			
4			
3			
2			
1			
0	3/2008	DSO	GENERAL REVISIONS

SCDOT

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 405
COLUMBIA, SC 29201

STANDARD DRAWING

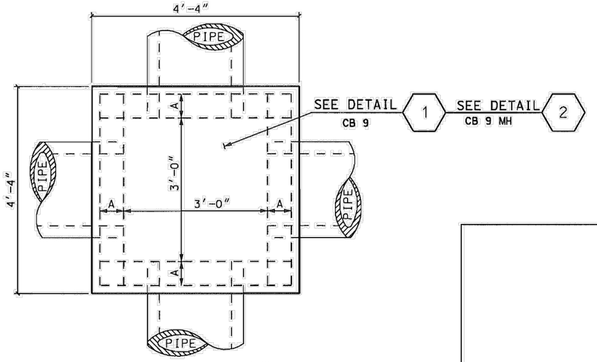
CATCH BASIN TYPE 9 & 9MH DETAILS

719-009-01

EFFECTIVE LETTING DATE: MAY, 2008

USE SHEETS 719-009-01 THROUGH 719-009-05 FOR THIS ITEM

THIS DRAWING IS NOT TO SCALE

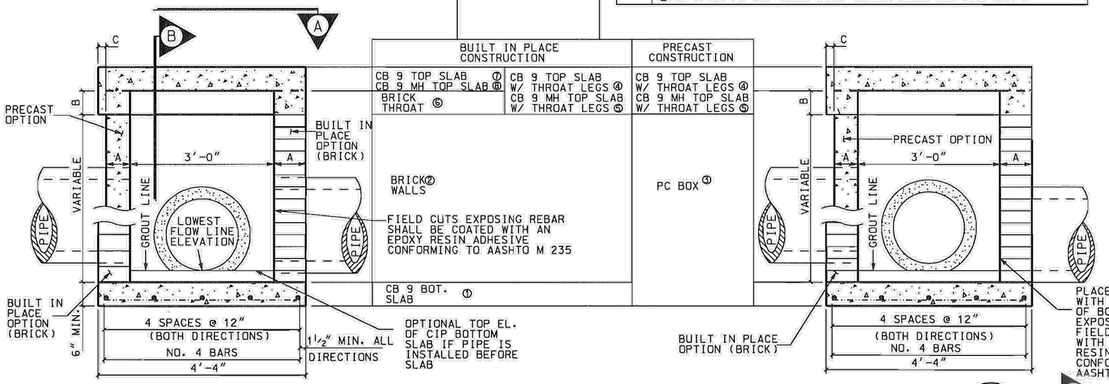


SECTION PLAN A

CONTRACTOR MAY USE PRECAST OR BUILT IN PLACE CONSTRUCTION NOTED ABOVE OR COMBINE OPTIONS AS DESIRED.

SEE QUALIFIED PRODUCT LIST 14 FOR MANUFACTURERS OF PRECAST ITEMS.

BUILT IN PLACE	① CB 9 BOTTOM SLAB (PC OR CIP 52"X52"X6") AND ② BRICK WALLS (8") AND ④ CB 9 PC TOP SLAB WITH THROAT LEGS (52"X52"X10") OR ⑤ CB 9 MH PC TOP SLAB WITH THROAT LEGS (52"X52"X10")
ALTERNATE BUILT IN PLACE	① CB 9 BOTTOM SLAB (PC OR CIP 52"X52"X6") AND ② BRICK WALLS (8") AND ⑥ BRICK THROAT (2 COARSE) AND ⑦ CB 9 PC TOP SLAB WITHOUT THROAT LEGS (52"X52"X5") OR ⑧ CB 9 MH PC TOP SLAB WITHOUT THROAT LEGS (52"X52"X5")
PRECAST	③ PC DRAINAGE BOX CONFORMING TO 719-310-00 OR 719-305-00 (3'X3'X__) (MAX 12' DEPTH) AND ④ CB 9 PC TOP SLAB WITH THROAT LEGS (52"X52"X10") OR ⑤ CB 9 MH PC TOP SLAB WITH THROAT LEGS (52"X52"X10")

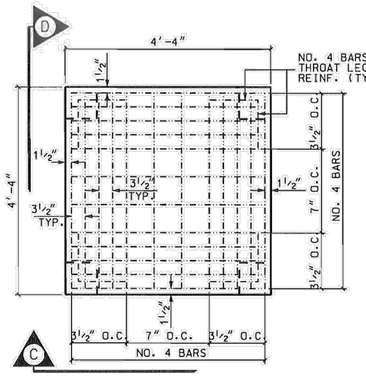


FRONT ELEVATION
CATCH BASIN TYPE 9

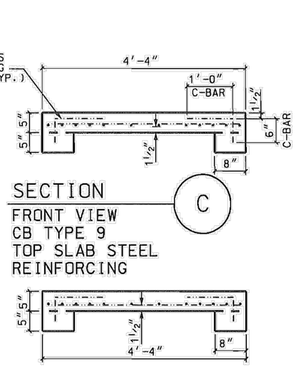
SECTION SIDE ELEVATION B

PRECAST ITEMS
CB 9 BOTTOM SLAB (52"X52"X6")
CB 9 TOP SLAB WITH THROAT LEGS (52"X52"X10")
CB 9 MH TOP SLAB WITH THROAT LEGS (52"X52"X10")
ALTERNATE CB 9 TOP SLAB WITHOUT THROAT LEGS (52"X52"X5")
SEE ALSO STD. DRAWING 719-310-00 & 719-305-00

TABLE 719-009A		
DIMENSION LABEL	PRECAST OPTION	BUILT IN PLACE OPTION
A	6"	8"
B	5"	2 COURSE OF BRICK
C	2"	0

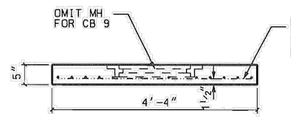


DETAIL 1
PLAN VIEW
CB TYPE 9
TOP SLAB STEEL
REINFORCING

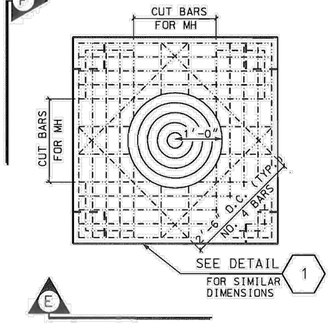


SECTION C
FRONT VIEW
CB TYPE 9
TOP SLAB STEEL
REINFORCING

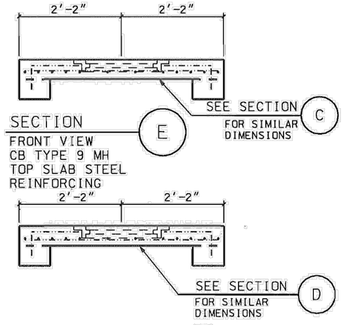
SECTION D
SIDE VIEW
CB TYPE 9
TOP SLAB STEEL
REINFORCING



DETAIL 3
ALTERNATE
CB 9 MH TOP
SLAB WITHOUT
THROAT LEGS
(ALLOWED ONLY
ON BRICK BOXES)



DETAIL 2
PLAN VIEW
CB TYPE 9 MH
TOP SLAB STEEL
REINFORCING



SECTION E
FRONT VIEW
CB TYPE 9 MH
TOP SLAB STEEL
REINFORCING

SECTION F
SIDE VIEW
CB TYPE 9 MH
TOP SLAB STEEL
REINFORCING

YARD INLET (YI) DETAIL
NOT TO SCALE

BID DOCUMENTS

THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION

AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT

CITY OF SUMTER
303 EAST LIBERTY STREET
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REGISTRATION

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March 28, 2024

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ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	03/28/2024	FOR BID

KEY PLAN

PROJECT NUMBER

60591852

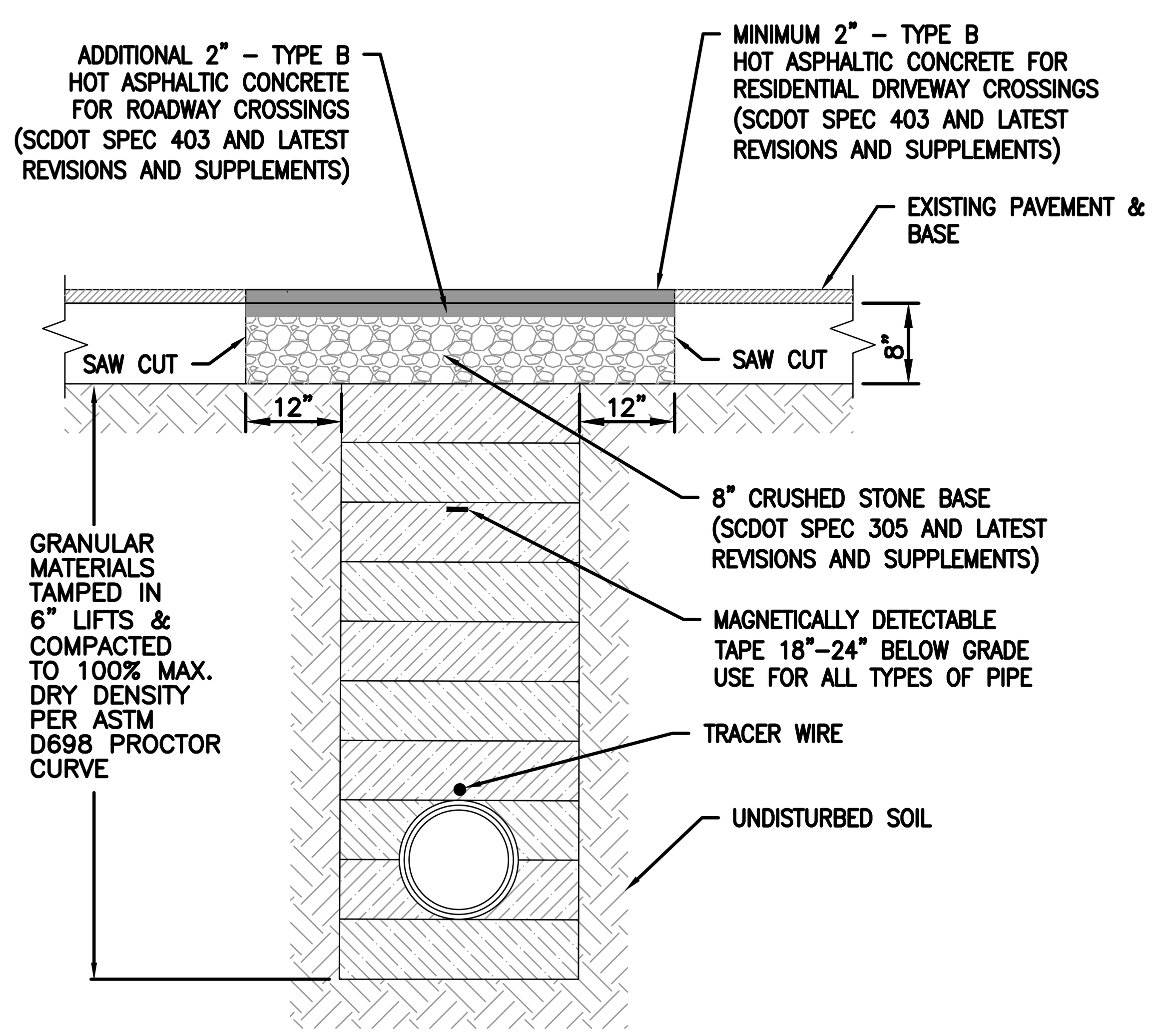
SHEET TITLE

STORMWATER DETAILS

SHEET NUMBER

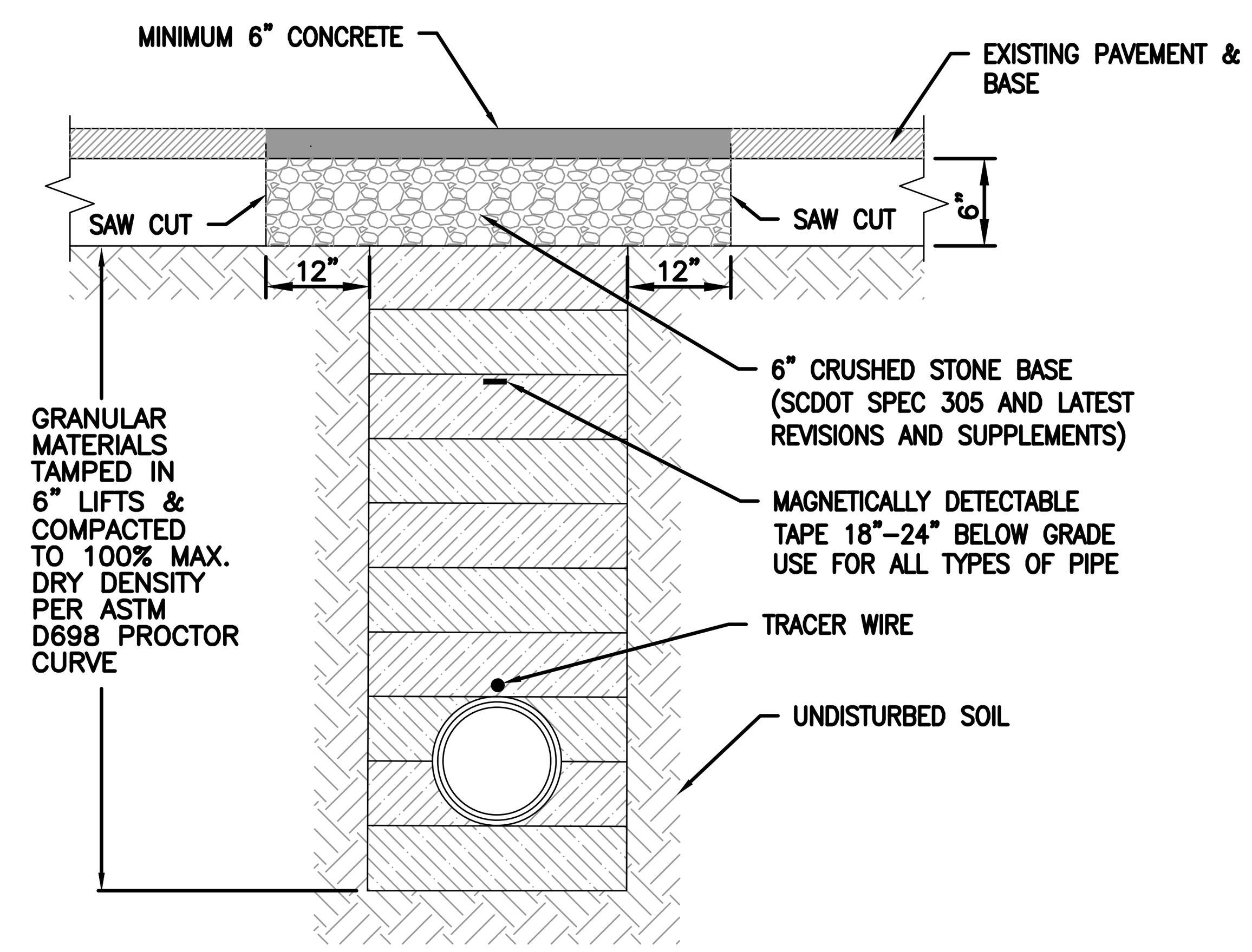
C12

Filename: L:\LEGACY\2285SR-C870011CAE\INTEROFFICE\60591852_SUMTER CROSSWELL STORMWATER\900-WORK\910-DRAWINGS\PHASE 1\SHEETS\60591852_DETAILS.DWG



ASPHALT PAVEMENT REPLACEMENT

SCALE: NTS

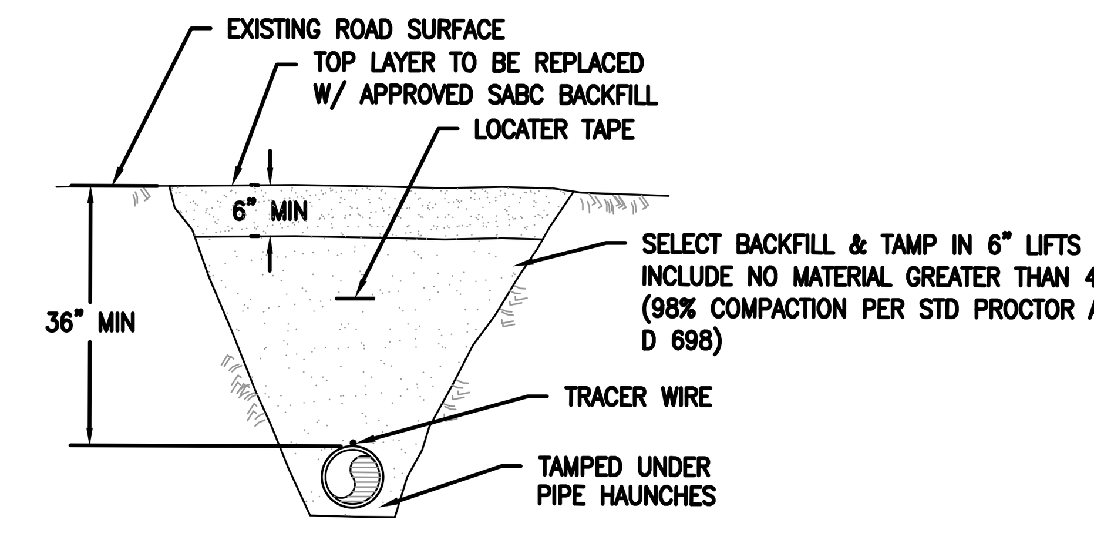


NOTE:

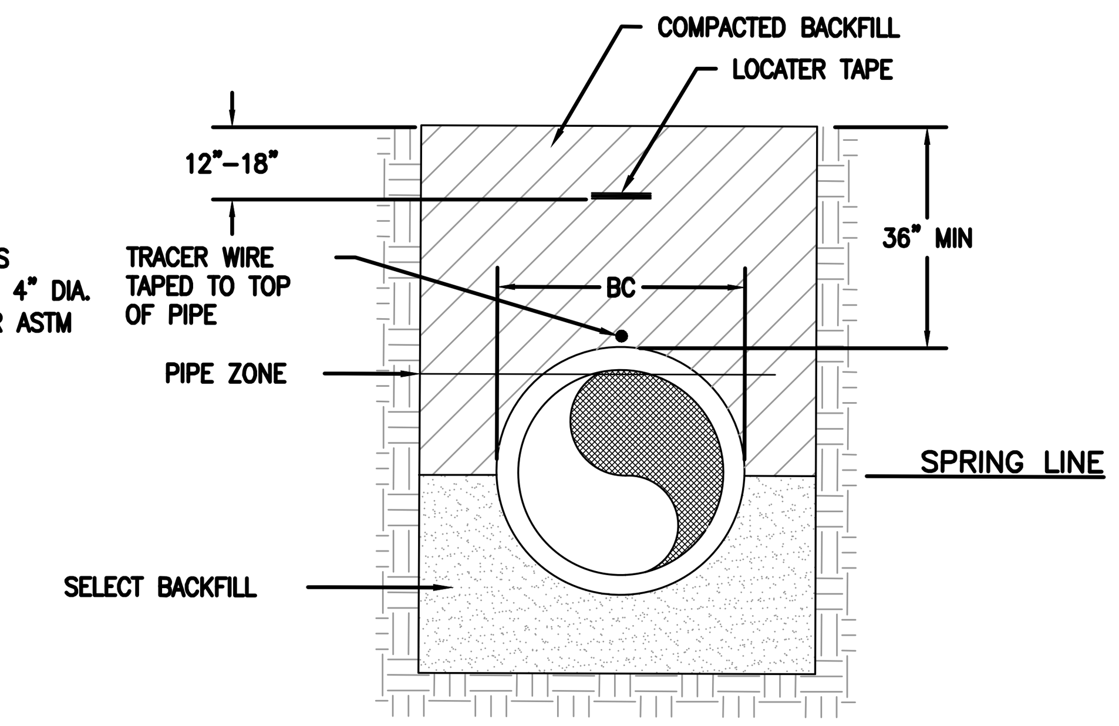
1. FOR CONCRETE DRIVEWAY REPLACEMENT, USE MINIMUM 4" OF 3500 PSI CONCRETE AND 6" CRUSHED STONE BASE AS PER PERMIT REQUIREMENTS

CONCRETE DRIVE PAVEMENT REPLACEMENT

SCALE: NTS

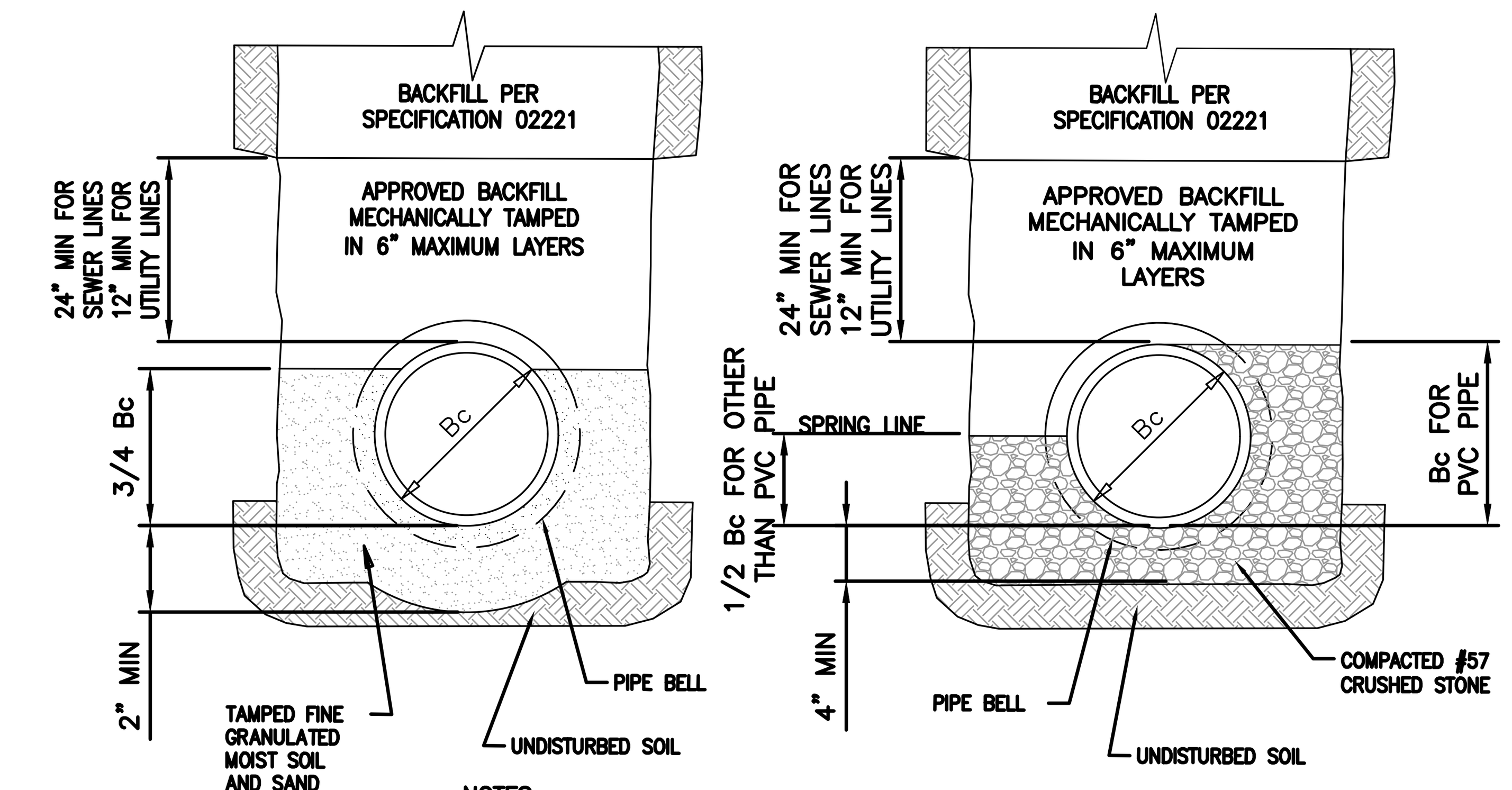


UNPAVED ROADWAY BEDDING DETAIL



TYPICAL BEDDING DETAIL

NOTES:
1. PAVEMENT CUT TO EXTEND 12" BEYOND EDGES OF TRENCH AS SHOWN.
2. MATCH EXISTING PAVEMENT TYPE AND THICKNESS. MINIMUM THICKNESS OVER TRENCH IS 2".
3. ALL INSTALLATIONS IN PUBLIC ROADWAYS SHALL COMPLY WITH CONDITIONS OUTLINED ON APPLICABLE ENCROACHMENT PERMIT.



NOTES:
1. 1/4 Bc HAND SHAPED BOTTOM - SHAPE BELL HOLES FOR USE IN DRY EARTH TRENCHES ONLY. APPLICABLE TO BOTH EARTH AND ROCK TRENCHES.

TYPE 1

TYPE 2

BEDDING DETAIL

NOT TO SCALE

BID DOCUMENTS

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Filename: L:\LEGACY\2285SR-C87001\CAE\INTEROFFICE\60591852_SUMTER CROSSWELL STORMWATER\900-WORK\910-DRAWINGS\PHASE 1\SHEETS\60591852_DETAILS.DWG

AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

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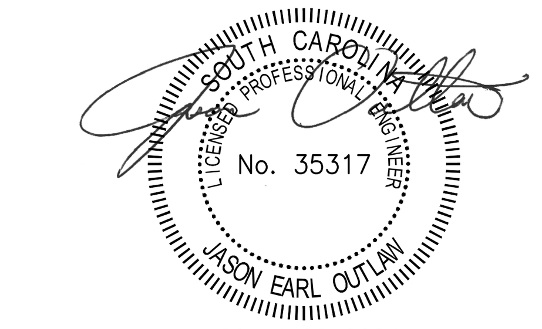
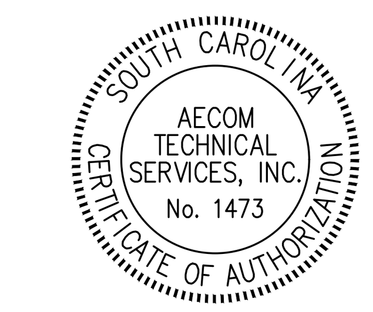


March 28, 2024



ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	03/28/2024	FOR BID

KEY PLAN

PROJECT NUMBER

60591852

SHEET TITLE

MISCELLANEOUS DETAILS

SHEET NUMBER

C13

STANDARD SCDHEC NOTES

1. IF NECESSARY, SLOPES, WHICH EXCEED EIGHT (8) VERTICAL FEET SHOULD BE STABILIZED WITH SYNTHETIC OR VEGETATIVE MATS, IN ADDITION TO HYDROSEEDING. IT MAY BE NECESSARY TO INSTALL TEMPORARY SLOPE DRAINS DURING CONSTRUCTION. TEMPORARY BERMS MAY BE NEEDED UNTIL THE SLOPE IS BROUGHT TO GRADE.
2. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOURTEEN (14) DAYS AFTER WORK HAS CEASED, EXCEPT AS STATED BELOW.
   A. WHERE STABILIZATION BY THE 14TH DAY IS PRECLUDED BY SNOW COVER OR FROZEN GROUND CONDITIONS STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICABLE.
   B. WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, & EARTH-DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 14 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE.
3. ALL SEDIMENT & EROSION CONTROL DEVICES SHALL BE INSPECTED ONCE EVERY CALENDAR WEEK. IF PERIODIC INSPECTION OR OTHER INFORMATION INDICATES THAT A BMP HAS BEEN INAPPROPRIATELY OR INCORRECTLY INSTALLED, THE PERMITTEE MUST ADDRESS THE NECESSARY REPLACEMENT OR MODIFICATION REQUIRED TO CORRECT THE BMP WITHIN 48 HOURS OF IDENTIFICATION.
4. PROVIDE SILT FENCE AND/OR OTHER CONTROL DEVICES, AS MAY BE REQUIRED, TO CONTROL SOIL EROSION DURING UTILITY CONSTRUCTION. ALL DISTURBED AREAS SHALL BE CLEANED, GRADED, AND STABILIZED WITH GRASSING IMMEDIATELY AFTER THE UTILITY INSTALLATION. FILL, COVER, AND TEMPORARY SEEDING AT THE END OF EACH DAY ARE RECOMMENDED. IF WATER IS ENCOUNTERED WHILE TRENCHING, THE WATER SHOULD BE FILTERED TO REMOVE ANY SEDIMENTS BEFORE BEING PUMPED BACK INTO ANY WATERS OF THE STATE.
5. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES & ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFFSITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED.
6. THE CONTRACTOR MUST TAKE NECESSARY ACTION TO MINIMIZE THE TRACKING OF MUD ONTO PAVED ROADWAY(S) FROM CONSTRUCTION AREAS & THE GENERATION OF DUST. THE CONTRACTOR SHALL DAILY REMOVE MUD/SOIL FROM PAVEMENT, AS MAY BE REQUIRED.
7. RESIDENTIAL SUBDIVISIONS REQUIRE EROSION CONTROL FEATURES FOR INFRASTRUCTURE AS WELL AS FOR INDIVIDUAL LOT CONSTRUCTION. INDIVIDUAL PROPERTY OWNERS SHALL FOLLOW THESE PLANS DURING CONSTRUCTION OR OBTAIN APPROVAL OF AN INDIVIDUAL PLAN IN ACCORDANCE WITH S.C. REG. 72-300 ET. SEQ. AND SCR100000.
8. TEMPORARY DIVERSION BERMS AND/OR DITCHES WILL BE PROVIDED AS NEEDED DURING CONSTRUCTION TO PROTECT WORK AREAS FROM UPSLOPE RUNOFF AND/OR TO DIVERT SEDIMENT-LADEN WATER TO APPROPRIATE TRAPS OR STABLE OUTLETS.
9. ALL WATERS OF THE STATE (WOS), INCLUDING WETLANDS, ARE TO BE FLAGGED OR OTHERWISE CLEARLY MARKED IN THE FIELD. A DOUBLE ROW OF SILT FENCE IS TO BE INSTALLED IN ALL AREAS WHERE A 50-FOOT BUFFER CAN'T BE MAINTAINED BETWEEN THE DISTURBED AREA AND ALL WOS. A 10-FOOT BUFFER SHOULD BE MAINTAINED BETWEEN THE LAST ROW OF SILT FENCE AND ALL WOS.
10. LITTER, CONSTRUCTION DEBRIS, OILS, FUELS, & BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT (SUCH AS STOCKPILES OF FRESHLY TREATED LUMBER) & CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE IN STORM WATER DISCHARGES.
11. A COPY OF THE SWPPP, INSPECTION RECORDS & RAINFALL DATA MUST BE RETAINED AT THE CONSTRUCTION SITE OR A NEARBY LOCATION EASILY ACCESSIBLE DURING NORMAL BUSINESS HOURS, FROM THE DATE OF COMMENCEMENT OF CONSTRUCTION ACTIVITIES TO THE DATE THAT FINAL STABILIZATION IS REACHED.
12. INITIATE STABILIZATION MEASURES ON ANY EXPOSED STEEP SLOPE (3H:1V OR GREATER) WHERE LAND-DISTURBING ACTIVITIES HAVE PERMANENTLY OR TEMPORARILY CEASED, & WILL NOT RESUME FOR A PERIOD OF 7 CALENDAR DAYS.
13. MINIMIZE SOIL COMPACTION &, UNLESS INFEASIBLE, PRESERVE TOPSOIL.
    MINIMIZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT & VEHICLE WASHING, WHEEL WASH WATER & OTHER WASH WATERS. WASH WATERS MUST BE TREATED IN A SEDIMENT BASIN OR ALTERNATIVE CONTROL THAT PROVIDES EQUIVALENT OR BETTER TREATMENT PRIOR TO DISCHARGE.
14. MINIMIZE THE DISCHARGE OF POLLUTANTS FROM DEWATERING OF TRENCHES & EXCAVATED AREAS. THESE DISCHARGES ARE TO BE ROUTED THROUGH APPROPRIATE BMPS (SEDIMENT BASIN, FILTER BAG, ETC.)
15. THE FOLLOWING DISCHARGES FROM SITES ARE PROHIBITED:
    A. WASTEWATER FROM WASHOUT OF CONCRETE, UNLESS MANAGED BY APPROPRIATE CONTROL;
    B. WASTEWATER FROM WASHOUT/CLEANOUT OF STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS & OTHER CONSTRUCTION MATERIALS;
    C. FUELS, OILS, OR OTHER POLLUTANTS USED IN VEHICLE & EQUIPMENT OPERATION & MAINTENANCE;
    D. SOAPS OR SOLVENTS USED IN VEHICLE & EQUIPMENT WASHING
17. AFTER CONSTRUCTION ACTIVITIES BEGIN, INSPECTIONS MUST BE CONDUCTED AT A MINIMUM OF AT LEAST ONCE EVERY CALENDAR WEEK & MUST BE CONDUCTED UNTIL FINAL STABILIZATION IS REACHED ON ALL AREAS OF THE CONSTRUCTION SITE.
18. IF EXISTING BMPS NEED TO BE MODIFIED OR IF ADDITIONAL BMPS ARE NECESSARY TO COMPLY WITH THE REQUIREMENTS OF THIS PERMIT AND/OR SC'S WATER QUALITY STANDARDS, IMPLEMENTATION MUST BE COMPLETED BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE. IF IMPLEMENTATION IS IMPRACTICABLE, THE SITUATION MUST BE DOCUMENTED IN THE SWPPP AND ALTERNATIVE BMPS MUST BE IMPLEMENTED AS SOON AS REASONABLY POSSIBLE.
19. A PRE-CONSTRUCTION CONFERENCE MUST BE HELD FOR EACH CONSTRUCTION SITE WITH AN APPROVED ON-SITE SWPPP PRIOR TO THE IMPLEMENTATION OF CONSTRUCTION ACTIVITIES. FOR NON-LINEAR PROJECTS THAT DISTURB 10 ACRES OR MORE THIS CONFERENCE MUST BE HELD ON-SITE UNLESS THE DEPARTMENT HAS APPROVED OTHERWISE.

CONSTRUCTION SEQUENCE

1. NOTIFY CITY OF SUMTER OFFICE AT LEAST 48 HOURS IN ADVANCE OF LAND DISTURBING ACTIVITIES. (DAY 1)
2. INSTALL PERIMETER EROSION CONTROL MEASURES. (WEEK 1)
3. PERFORM DEMOLITION OPERATIONS AS SHOWN IN THE ARCHITECT PHASING PLAN AS WELL AS DEMOLITION PLANS. CLEAR AND GRUB SITE IN THE AREAS TO BE DEVELOPED. REMOVE AND DISPOSE OF ITEMS OFFSITE AS APPROPRIATE. (WEEK #2)
4. IF NECESSARY, STRIP AND STOCKPILE TOPSOIL. (WEEK #3)
5. PERFORM ROUGH GRADING OPERATIONS ON THE SITE. (WEEK #3)
6. INSTALL EROSION CONTROL DEVICES AS REQUIRED OR NEEDED AS STORM DRAINAGE STRUCTURES AND THE SITE IS EXTENDED TO FINISHED GRADE. (WEEK #8)
7. CONSTRUCT REMAINDER OF THE SITE IMPROVEMENTS. (WEEK #12)
8. APPLY TOPSOIL AND INITIATE PERMANENT VEGETATIVE STABILIZATION MEASURES AS FINAL GRADE IS REACHED IN AREAS TO REMAIN UNPAVED. (WEEK #16)
9. INSPECT AND MAINTAIN ALL STORM DRAINS AND SEDIMENT AND EROSION CONTROL MEASURES UNTIL THE SITE IS COMPLETELY STABILIZED. (ON-GOING)
10. APPLY SEEDING AND SODDING AS NECESSARY AS TOPSOIL HAVE BEEN SPREAD AND THE SITE HAS BEEN BROUGHT TO FINAL GRADE.(WEEK #16)
11. SUBMIT TO THE ENGINEER AN AS-BUILT FIELD SURVEY OF ALL STORMWATER IMPROVEMENTS INCLUDING BUT NOT LIMITED TO PIPES AND FINALIZED UTILITY LOCATIONS. (WEEK #48)
12. UPON COMPLETE STABILIZATION OF SITE, REMOVE ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AND REMOVE SEDIMENT BUILDUP FROM THE STORMWATER SYSTEM. (WEEK #50)
13. UPON SUBSTANTIAL PROJECT COMPLETION, CONTRACTOR TO CLEAR EXISTING CULVERTS/PIPES, CATCH BASINS, AND DITCHES ALONG FRONTAGE AND DOWNSTREAM AS NECESSARY TO ACHIEVE POSITIVE DRAINAGE.

SEEDING SCHEDULE

(PER 1,000 SF)

PLANT SELECTION
PLANT SEED SELECTION SHOULD BE BASED ON THE TYPE OF SOIL, THE SEASON OF THE YEAR IN WHICH THE PLANTING IS TO BE DONE, AND THE NEEDS AND DESIRES OF THE PERMANENT LAND USER. REFER TO THE SPECIFICATIONS TO SELECT THE DESIRED SPECIES TO BE PLANTED. FAILURE TO CAREFULLY FOLLOW AGRONOMIC RECOMMENDATIONS OFTEN RESULT IN AN INADEQUATE STAND OF PERMANENT VEGETATION THAT PROVIDES LITTLE OR NO EROSION CONTROL. THE RATES ARE BASED ON PURITY AND GERMINATION STANDARDS REQUIRED FOR CERTIFICATION.

TOPSOIL
IF SURFACE SOIL OF THE SEEDBED IS NOT ADEQUATE FOR PLANT GROWTH, TOPSOIL SHOULD BE APPLIED.

TILLAGE
IF THE AREA HAS BEEN RECENTLY PLOWED, NO TILLAGE IS REQUIRED OTHER THAN RAKING OR SURFACE ROUGHENING TO BREAK ANY CRUST THAT HAS FORMED AND TO LEAVE A TEXTURED SURFACE. IF THE SOIL IS COMPACTED LESS THAN 6-INCHES, IT SHOULD BE DISKED FOR OPTIMAL GERMINATION. IF THE SOIL IS COMPACTED MORE THAN 6-INCHES, IT SHOULD BE SUB-SOILED AND DISKED.

SOIL TESTING
INFORMATION AND TEST PROVIDER IS AVAILABLE FROM THE PW/SWD AND THE SOIL AND WATER CONSERVATION DISTRICT OFFICE.

LIME
UNLESS A SPECIFIC SOIL TEST INDICATES OTHERWISE, APPLY 1¢ TONS OF GROUND COURSE TEXTURED AGRICULTURAL LIMESTONE PER ACRE (70 POUNDS PER 1,000 SQUARE FEET).

FERTILIZER
A MINIMUM OF 1,000 POUNDS PER ACRE OF A COMPLETE 10-10-10 FERTILIZER (23 POUNDS PER 1,000 SQUARE FEET) OR EQUIVALENT SHOULD BE APPLIED DURING PERMANENT SEEDING OF GRASSES UNLESS A SOIL TEST INDICATES A DIFFERENT REQUIREMENT. FERTILIZER AND LIME (IF USED) SHOULD BE INCORPORATED INTO THE TOP 4-6 INCHES OF THE SOIL BY DISKING OR OTHER MEANS WHERE CONDITIONS ALLOW. DO NOT MIX THE LIME AND THE FERTILIZER PRIOR TO THE FIELD APPLICATION.

SEEDING
THE SURFACE OF THE SOIL SHOULD BE LOOSENED JUST BEFORE BROADCASTING THE SEED. SEED SHOULD BE EVENLY APPLIED BY THE MOST CONVENIENT METHOD AVAILABLE FOR THE TYPE OF SEED TO BE APPLIED. TYPICAL APPLICATION METHODS INCLUDE BUT ARE NOT LIMITED TO CYCLONE SEEDERS, ROTARY SPREADERS, DROP SPREADERS, BROADCAST SPREADERS, HAND SPREADERS, CULTIPACKER SEEDER, AND HYDRO-SEEDERS. COVER APPLIED SEED BY RAKING OR DRAGGING A CHAIN OR BRUSH MAT, AND THEN LIGHTLY FIRM THE AREA WITH A ROLLER OR CULTIPACKER. DO NOT ROLL SEED THAT IS APPLIED WITH A HYDR-SEEDER AND HYDR-MULCH. BEING

MULCHING
ALL PERMANENT SEEDED AREAS SHOULD BE COVERED WITH MULCH IMMEDIATELY UPON COMPLETION OF THE SEEDING APPLICATION TO RETAIN SOIL MOISTURE AND REDUCE EROSION DURING ESTABLISHMENT OF VEGETATION. THE MULCH SHOULD BE APPLIED EVENLY IN SUCH A MANNER THAT IT PROVIDES A MINIMUM OF 75% COVERAGE. TYPICAL MULCH APPLICATIONS INCLUDE STRAW, WOOD CHIPS, BARK, WOOD FIBER, AND COMPOST MULCH. THE MOST COMMONLY ACCEPTED MULCH USED IN CONJUNCTION WITH PERMANENT SEEDING IS SMALL GRAIN STRAW. THIS STRAW SHOULD BE DRY AND FREE FROM MOLD DAMAGE AND NOXIOUS WEEDS. THE STRAW MAY NEED TO BE ANCHORED WITH NETTING OR ASPHALT EMULSIONS TO PREVENT IT FROM BEING BLOWN OR WASHED AWAY. THE STRAW MULCH MAY BE APPLIED BY HAND OR MACHINE AT THE RATE 2 TONS PER ACRE (90 POUNDS PER 1,000SF). FREQUENT INSPECTIONS ARE NECESSARY TO CHECK THAT CONDITIONS FOR GROWTH ARE GOOD.

IRRIGATION
PERMANENT SEEDED AREAS SHOULD BE KEPT ADEQUATELY MOIST, ESPECIALLY LATE IN THE SPECIFIC GROWING SEASON. IRRIGATE THE SEEDED AREA IF NORMAL RAINFALL IS NOT ADEQUATE FOR THE GERMINATION AND GROWTH OF SEEDLINGS. WATER SEEDED AREAS AT CONTROLLED RATES THAT ARE LESS THAN THE RATE AT WHICH THE SOIL CAN ABSORB WATER TO PREVENT RUNOFF.

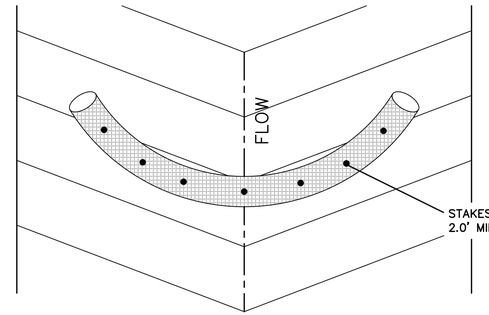
RE-SEEDING
INSPECT PERMANENTLY SEEDED AREAS FOR FAILURE, MAKE NECESSARY REPAIRS AND RE-SEED OR OVERSEED WITHIN THE SAME GROWING SEASON IF POSSIBLE. IF THE GRASS COVER IS SPARSE OR PATCHY, RE-EVALUATE THE CHOICE OF GRASS AND QUANTITIES OF LIME AND FERTILIZER APPLIED. IF THE PERMANENT SEEDING HAS LESS THAN 40% COVER, HAVE THE SOIL TESTED TO DETERMINE ANY ACIDITY OR NUTRIENT DEFICIENCY PROBLEMS. FINAL STABILIZATION BY PERMANENT SEEDING OF THE SITE REQUIRES THAT IT BE COVERED BY A 70% COVERAGE RATE.

POST-STABILIZATION
ONCE AREAS ARE STABILIZED THEY CAN BE CONVERTED TO NATIVE SPECIES OR FOR ESTABLISHING ON NON-CRITICAL, LEVEL SITES. TABLE 3.16 LISTS SOME NATIVE SPECIES OF LEXINGTON COUNTY THAT CAN BE USED.

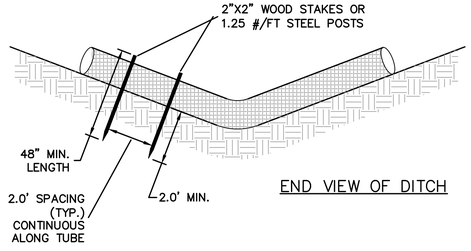
*** SEE SEEDING SCHEDULE TABLES ON SHEET 2 – EROSION CONTROL PLAN

INSTALLATION NOTES:

1. INSTALL OVER BARE SOIL, MULCHED AREAS OR EROSION CONTROL BLANKETS. BE COMPOSED OF GEOTEXTILES, CURLED EXCELSIOR WOOD, NATURAL COCONUT FIBER OR HARDWOOD MULCH ENCLOSED BY A FLEXIBLE NETTING MATERIAL. STRAW, STRAW FIBER, STRAW BALES, PINE NEEDLES AND LEAF MULCH ARE NOT ALLOWED.
2. THE MINIMUM DIAMETER SHOULD BE 18 INCHES. SEDIMENT TUBES SHOULD BE STAKED USING WOODEN STAKES (2-INCH X 2-INCH) OR STEEL POSTS (STANDARD "U" OR "T" SECTIONS WITH A MINIMUM WEIGHT OF 1.25 POUNDS PER FOOT) A MINIMUM OF 48-INCHES IN LENGTH PLACED ON 2-FOOT CENTERS.
3. STAKES SHOULD BE INTERTWINED WITH THE OUTER MESH ON THE DOWNSTREAM SIDE AND DRIVEN IN THE GROUND TO A MINIMUM DEPTH OF 1.5 FEET LEAVING LESS THAN 1 FOOT OF STAKE EXPOSED ABOVE THE SEDIMENT TUBE. ALWAYS REFER TO THE MANUFACTURER'S RECOMMENDATIONS FOR THE STAKING DETAIL. INSTALL ALL SEDIMENT TUBES INSURING THAT NO GAPS EXIST BETWEEN THE SOIL AND THE BOTTOM OF THE SEDIMENT TUBE. THE ENDS OF ADJACENT SEDIMENT TUBES SHOULD BE LAPPED 6-INCH TO PREVENT FLOW AND SEDIMENT FROM PASSING THROUGH THE FIELD JOINT.IN NO SITUATIONS SHOULD SEDIMENT TUBES BE STACKED ON TOP OF ONE ANOTHER.
4. CONSTUCT A TRENCH THAT IS 20% OF THE TUBE DIAMATER TO INTALL THE TUBE IN. AVOID DAMAGE TO SEDIMENT TUBES WHILE INSTALLING THEM. IF THE SEDIMENT TUBE BECOMES DAMAGED DURING INSTALLATION, A STAKE SHOULD BE PLACED ON BOTH SIDES OF THE DAMAGED AREA TERMINATING THE TUBE SEGMENT AND A NEW TUBE SEGMENT SHOULD BE INSTALLED. SHOULD BE INSTALLED IN SWALES OR DRAINAGE DITCHES PERPENDICULAR TO THE FLOW OF WATER. SEDIMENT TUBES SHOULD CONTINUE UP THE SIDE SLOPES A MINIMUM OF 1 FOOT ABOVE THE DESIGN FLOW DEPTH. SEDIMENT TUBES SHOULD BE SPACED ACCORDING TO THE FOLLOWING TABLE.



TOP VIEW OF DITCH



END VIEW OF DITCH

INSPECTION AND MAINTENANCE NOTES:

1. CHECK DAMS SHOULD BE INSPECTED EVERY 7 CALENDAR DAYS.
2. LARGE DEBRIS, TRASH, AND LEAVES SHOULD BE REMOVED.
3. IF EROSION CAUSES THE EDGES TO FALL TO A HEIGHT EQUAL TO OR BELOW THE HEIGHT OF THE CENTER, REPAIRS SHOULD BE MADE IMMEDIATELY.
4. REMOVE ACCUMULATED SEDIMENT FROM THE UPSTREAM SIDE OF THE SEDIMENT TUBE WHEN THE SEDIMENT HAS REACHED A HEIGHT OF APPROXIMATELY ONE-THIRD OF THE EXPOSED HEIGHT OF THE TUBE (MEASURED AT THE CENTER).
5. ACCUMULATED SEDIMENT SHOULD BE REMOVED PRIOR TO REMOVING SEDIMENT TUBES.
6. SEDIMENT TUBE REMOVAL SHOULD BE COMPLETED ONLY AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN COMPLETELY STABILIZED. PERMANENT VEGETATION SHOULD REPLACE AREAS FROM WHICH GRAVEL, STONE, SEDIMENT TUBES, OR OTHER MATERIALS HAVE BEEN REMOVED.
7. SEDIMENT TUBES ARE REQUIRED FOR ALL OPEN CHANNELS AND OUTFALLS WITHIN THE PROJECT AREA.

NOTES:

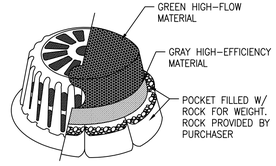
1. SEDIMENT TUBE LENGTH SELECTED SHOULD MINIMIZE THE NUMBER OF SEDIMENT TUBES NEEDED TO SPAN THE WIDTH OF THE DRAINAGE CONVEYANCE. IF THE DITCH CHECK LENGTH (PERPENDICULAR TO THE WATER FLOW) IS 15 FEET, THEN ONE 15 FOOT SEDIMENT TUBE IS PREFERRED COMPARED TO TWO OVERLAPPING 10 FOOT SEDIMENT TUBES.
2. SEDIMENT TUBES FOR DITCH CHECKS SHOULD REMAIN IN PLACE UNTIL FULLY ESTABLISHED VEGETATION AND ROOT SYSTEMS HAVE COMPLETELY DEVELOPED AND CAN SURVIVE ON THEIR OWN.

SEDIMENT TUBE SPACING

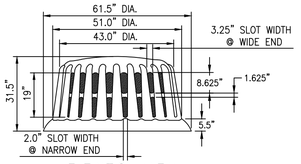
SLOPE	MAXIMUM SEDIMENT TUBE SPACING
LESS THAN 2%	150-FEET
2%	100-FEET
3%	75-FEET
4%	50-FEET
5%	40-FEET
6%	30-FEET
GREATER THAN 6%	25-FEET

SEDIMENT TUBING

(NOT TO SCALE)



ISOMETRIC VIEW

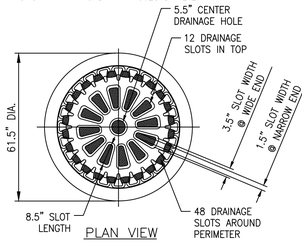


ELEVATION VIEW

REPLACEMENT FILTERS: MODEL # R-140

SILT-SAVER
Sediment Control Products

SHOWN WITH ROADWAY PROJECTS FILTER HAT

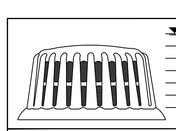


PLAN VIEW

NOTE:

1. SILT SAVERS ARE REQUIRED FOR ALL NEW INLETS WITHIN THE PROJECT AREA.

INLET PROTECTION
(SILT SAVER, OR APPROVED EQUAL)
(NOT TO SCALE)



FRAME & FILTER DISCHARGE ANALYSIS

HEAD (FT)	EQUATION USED	OPENING AREA (SF)	FRAME FLOW (CFS)	FILTER AREA (SF)	FILTERED FLOW (CFS)
0.5	0	2.1	7	6	2
1.0	0	3.9	19	12	3
1.5	0	7.0	41	18	5
2.0	0	8.0	54	24	7
2.5	0	9.2	70	30	9
3.0	0	9.2	77	—	77

DUE TO NARROW SLOT, A TRANSITION WILL OCCUR BETWEEN WEIR AND ORIFICE CONDITIONS. ORIFICE FLOW WILL PROVIDE A MORE CONSERVATIVE ESTIMATE OF FLOW, THEREFORE THE LESSER OF THE ORIFICE AND WEIR FLOWS WILL BE USED FOR EACH STAGE CALCULATION.

FILTER MATERIAL ALLOWS 129 gpm/SF OR 0.29cfs/SF
ORIFICE EQUATION (O) = Q=0.6A(2gh)^0.5
P = FEET PERIMETER
h = HEAD IN FEET
Q = CAPACITY IN cfs
A = FREE OPEN AREA OF FRAME
g = 32.2 FEET-PER-SECOND/SECOND

FILTER OPTIONS
FILTER HAT IS AVAILABLE IN THREE OPTIONS:
1) ALL HIGH-FLOW MATERIAL
2) ALL HIGH-EFFICIENCY MATERIAL
3) HIGH-FLOW MATERIAL ON TOP HALF OF HAT, HIGH-EFFICIENCY MATERIAL ON BOTTOM HALF (THIS FILTER COVER IS RECOMMENDED FOR ALL ROADWAY PROJECTS.)
IT IS THE PURCHASERS RESPONSIBILITY TO PURCHASE APPROPRIATE FILTER HAT. PURCHASER SHALL PROVIDE ROCK FOR FILTER POCKETS.

FILTER HAT INSTALLATION
FILTER HAT SLIDES DIRECTLY OVER FILTER FRAME. TO KEEP FILTER FRAME IN PLACE OVER STORM STRUCTURE, ROCK POCKETS ARE SEWN DIRECTLY INTO FILTER HAT MATERIAL. EVERY FILTER HAT COMES IN ONE PIECE FOR EASY INSTALLATION.

MAINTENANCE
ALL TEMPORARY EROSION, SEDIMENTATION, & POLLUTION CONTROL PRACTICES SHOULD BE INSPECTED DAILY. CONTRACTOR SHALL REMOVE SEDIMENT AND DISPOSE OF IN A PROPER MANNER. INSPECT R-100A DAILY FOR CUTS, ABRASIONS, AND PROPER INSTALLATION. REPLACE OR REPOSITION AS NECESSARY.

SPECIFICATIONS
FILTER FABRIC: SILT-SAVER HAT SHALL BE BASED ON DESIGN PROFESSIONAL'S SPECIFICATIONS.

BID DOCUMENTS

THESE DOCUMENTS ARE FOR THE PURPOSE OF SOLICITATION OF BIDS AND ARE NOT FOR USE FOR CONSTRUCTION

AECOM

PROJECT

CROSSWELL NEIGHBORHOOD STORMWATER IMPROVEMENTS PHASE 1

CLIENT

CITY OF SUMTER
303 EAST LIBERTY STREET
SUMTER, SOUTH CAROLINA, 29150
TEL: 803.436.2558

CONSULTANT

AECOM
101 RESEARCH DRIVE
COLUMBIA, SOUTH CAROLINA, 29203
803.254.4400 TEL 803.771.6675 FAX
WWW.AECOM.COM

REGISTRATION

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER
No. 35317
JASON EARL OUTLAW
March 28, 2024

SOUTH CAROLINA
AECOM TECHNICAL SERVICES, INC.
No. 1473
CERTIFICATE OF AUTHORIZATION

ISSUE/REVISION

1	03/28/2024	FOR BID
I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60591852

SHEET TITLE

SEDIMENT & EROSION CONTROL DETAILS

SHEET NUMBER

C14

Filename: L:\LEGACY\22855R-C87001\CAE\INTEROFFICE\60591852_SUMTER CROSSWELL STORMWATER\900-WORK\910-DRAWINGS\PHASE 1\SHEETS\60591852_DETAILS.DWG