

Contract Documents & Specifications

North Maple Street Extension Project

October 2022

Town of Summerville
200 S. Main Street
Summerville, SC 29483

Bid Document Set No. _____

CONTRACT DOCUMENTS & SPECIFICATIONS

North Maple Street Extension Project

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SECTION 1

Section 1 Documents:

Invitation for Bids

Information for Bidders

INVITATION FOR BIDS

Sealed Bids will be received by the Town of Summerville, South Carolina, at Town Hall, 200 South Main Street, Summerville, SC 29483, up to 2:00 p.m. local time on Monday, October 31, 2022, and immediately thereafter publicly opened and read aloud in the 2nd floor training room at Summerville Town Hall Annex, located at 200 S. Main Street, Summerville, SC 29483, for the furnishing of labor, material, and equipment for:

North Maple Street Extension Project

The work includes grading, drainage, and paving for S-59 (Parsons Road), S-131 (North Maple Street), S-65 (W Richardson Avenue, and US 78 (W 5th N Street). Work also includes the relocation of S-59 (Parsons Road), pavement markings, signing, and traffic control for the entire project, and street lighting along S-131 (North Maple Street). The project also includes traffic signal installation, in-contract sewer line relocation, railroad and utility coordination. The total estimated roadway length of the project is approximately 2.22 miles.

A mandatory pre-bid conference will be held at 9:30 a.m. local time on Wednesday, October 12, 2022, in the Council Chambers, Summerville Town Hall Annex, 200 South Main Street, Summerville, South Carolina 29483.

The Contract Documents will be available on or about October 3, 2022 on the Town's website.

All questions in connection with this bid shall be directed to the Town of Summerville Representative: Scott McDonald at SMcdonald@summervillesc.gov or 843-695-6508.

Each Bid must be accompanied by a certified check of the Bidder, or by a Bid Bond made payable to the Town of Summerville, for an amount equal to not less than five percent (5%) of the total Bid as a guarantee that, if the Bid is accepted, the required Agreement will be executed and that a 100% Performance Bond and 100% Payment Bond will be furnished.

The Town of Summerville reserves the right to waive any informalities in bidding and to reject all Bids if it is in the Town's best interest to do so. Unless all bids are rejected, award will be made by the Town of Summerville.

Scott McDonald
Purchasing Agent

INFORMATION FOR BIDDERS

RECEIPT AND OPENING OF BIDS: Bids will be received at the time and place as specified in the Invitation for Bids, and then at said office publicly opened and read aloud.

LICENSES: The attention of Bidders is directed to the provisions of the acts for licensing of General Contractors for the State of South Carolina and all requirements of such acts which have bearing upon this work shall be deemed a part of the Specifications as if written therein in full. The showing by the Contractor of his license number shall be deemed as the Contractor's representation that he is legally qualified to enter into the prescribed Contract for any or all portions of the work included in his Bid.

All Bidders submitting a Bid shall have a currently valid "Contractor's License" for the State of South Carolina. This license number shall be shown on the bid form immediately below the signature identification and on the face of the sealed envelope containing the submitted Bid. **BIDS SUBMITTED WITHOUT THIS AFFIDAVIT MAY BE REJECTED AS UNRESPONSIVE.**

Subcontractors who will be engaged by the General Contractor shall also hold the required licenses.

PREQUALIFICATIONS: Prequalification of prime contractors is the procedure established and administered by South Carolina Department of Transportation by virtue of which prospective bidders (prime contractors) are required to establish their responsibility and competence in advance of submitting bid proposals. The Town of Summerville shall only accept bids from properly prequalified prime contractors.

BID SECURITY: Each Bid must be accompanied by a certified check from the Bidder, drawn through a recognized financial institution, or a Bid Bond duly executed by the Bidder as principal and having as surety thereon a surety company qualified to do business under the laws of the State of South Carolina and satisfactory to the Town, in an amount not less than five (5) percent of the Bid.

Such check or Bid Bond will be returned to all except the three (3) lowest Bidders within three (3) days after the opening of the Bids, and the remaining checks or Bid Bonds will be returned promptly after the Town and the accepted Bidder have executed the Agreement, or if no award has been made within one hundred and twenty (120) calendar days after the date of the opening of Bids, upon demand of the Bidder at any time thereafter, so long as he has not been notified of the acceptance of his bid.

The Bid Security will be forfeited to the Town of Summerville as penalties in case an award is made and the:

- a. Notice of Award is not accepted
- b. Performance/Payment Bonds are not submitted, and/or
- c. The Contract is not performed in a manner satisfactory to the Town of Summerville based on the requirements as set out in the Invitation for Bids documents.

Bids in excess of \$25,000.00 received without said bid security deposit shall be considered as non-responsive and rejected.

DRUG-FREE WORKPLACE: Bidder shall comply with the South Carolina Drug-free Workplace Act, Section 44-107-10 et seq., South Carolina Code of Laws (1976, as amended) and shall file a certification form with the Town of Summerville in accordance with the same. Aforesaid certification form is provided by the Town of Summerville in this Invitation for Bid and shall be executed by the Bidder (or, in case of a corporation, by a duly authorized representative of the corporation) and shall be delivered to the Town of Summerville together with the Bid. **BIDS SUBMITTED WITHOUT THIS AFFIDAVIT MAY BE REJECTED AS UNRESPONSIVE.**

AFFIDAVIT OF NON-COLLUSION: An affidavit of Non-Collusion contained herein, shall be signed, notarized and attached to and become a part of the bid. **BIDS SUBMITTED WITHOUT THIS AFFIDAVIT MAY BE REJECTED AS UNRESPONSIVE.**

AFFIDAVIT OF DELINQUENT TAX: An Affidavit of Delinquent Tax contained herein, **SHALL BE** signed, notarized and attached to and become a part of the bid. **BIDS SUBMITTED WITHOUT THIS AFFIDAVIT MAY BE REJECTED AS UNRESPONSIVE.**

GUARANTY BONDS: The Bidder to whom the contract is awarded will be required to execute the Agreement and obtain the Performance Bond and Payment Bond, each in the sum of the full amount of the Contract Price, within ten (10) calendar days from the date when Notice of Award is delivered to the Bidder.

The Bonds must be duly executed and acknowledged by the Bidder as principal and by a corporate surety company qualified to do business under the laws of the State of South Carolina and satisfactory to the Town as surety, for the faithful performance of the Contract and payment for labor and materials. The premiums for such Bonds shall be paid by the Contractor.

Each Bond must be valid for one year beyond the date of final acceptance of the project.

EXECUTION OF CONTRACT: The Town, within ten (10) calendar days of receipt of acceptable Performance Bond, Payment Bond, and Agreement signed by the party to whom the Agreement was awarded, shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the Town not execute the Agreement within such period, the Bidder may by written notice withdraw his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Town.

POWER OF ATTORNEY FOR BONDS: Attorneys-in-fact who sign Bid Bonds or Performance Bonds or Payment Bonds must file with each Bond a certified and effective dated copy of their power of attorney.

PENALTIES FOR FAILURE TO ENTER INTO CONTRACT: The successful Bidder, upon his failure or refusal to execute and deliver the Contract and Bonds required within ten (10) calendar days after he has received notice of the acceptance of his Bid, shall forfeit to the Town, as penalties for such failure or refusal, the security deposited with his bid.

LAWS AND REGULATIONS: All applicable laws, 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 as though herein written out in full.

IMMIGRATION ACT COMPLIANCE: By submitting an offer, Bidder certifies that it will comply with the applicable requirements of Title 8, Chapter 14 of the South Carolina code of Laws (originally enacted as Section 3 of The South Carolina Illegal Immigration act, 2008 S.C. Act No. 280) and agrees to provide upon request any documentation required to establish either: (a) the applicability of Title 8, Chapter 14 to Bidder and any subcontractor or sub-subcontractors; or (b) the compliance with Title 8, Chapter 14 by Bidder and any subcontractors or sub-subcontractors. Pursuant to Section 8-14-60, "A person who knowingly makes or files any false, fictitious, or fraudulent document, statement, or report pursuant to this chapter is guilty of a felony and, upon conviction, must be fined within the discretion of the court or imprisoned for not more than five years, or both". Bidder agrees to include in any contracts with its subcontractors language requiring the subcontractors to (a) comply with the applicable requirements of Title 8, Chapter 14, and (b) include in any contracts with the sub-subcontractors language requiring the sub-subcontract to comply with the applicable requirements of Title 8, Chapter 14.

NON-RESIDENT CONTRACTORS: A Bidder, who is a non-resident contractor, shall be aware of Section 12-9-310, Article 3, of the South Carolina Income Tax Act of 1926, as amended. This article requires the Town entering into a contract with a non-resident taxpayer, where such contract exceeds ten thousand dollars

(\$ 10,000), to withhold two percent (2%) of each payment made to the non-resident.

The funds deducted from the payment made to the non-resident contractor are funds deemed to be held in trust for the State of South Carolina and will be reported by the Town to the South Carolina Tax Commission. This Deduction is in addition to the retainage deductions specified in the General Conditions.

EXAMINATION OF DRAWINGS AND SPECIFICATIONS: Each Bidder shall carefully examine Drawings and Specifications and all Addenda or other revisions thereto and thoroughly familiarize himself with the detailed requirements thereof prior to submitting a Bid. If any Bidder is in doubt as to the true meaning of any part of the Drawings, Specifications, or other Documents, or if any error, discrepancy, conflict, or omission is noted, the Bidder should immediately contact the Town in writing and request clarification. The Town will clarify the intent of the Documents and/or correct such error, discrepancy, conflict, or omission, and will notify all Bidders by Addendum in cases where the extent of work or the cost thereof will be appreciably affected. No allowance will be made after Bids are received for oversight by a Bidder.

EXAMINATION OF SITE: Each Bidder shall visit the site of proposed work and fully acquaint himself with conditions relating to construction and labor so he may fully understand facilities, difficulties, and restrictions attending execution of work under contract. By executing the Agreement, the Contractor represents that he has visited the site, familiarized himself with the local conditions under which the work is to be performed, and correlated his observations with the requirements of the Contract Documents.

INFORMATION NOT GUARANTEED: All information given on the Drawings or in the Contract Documents relating to subsurface conditions, existing structures, location of utilities, sewer inverts, or other information on existing facilities, is from the best sources at present available to the Town. All such information is furnished only for the **information and convenience** of the Bidders. Bidders are advised that site conditions may vary from the plans due to development changes by property owner and the construction of the North Maple Street Extension.

It is agreed and understood that the Town does not warrant or guarantee that the conditions, utilities, pipes, or other structures encountered during construction will be the same as those indicated on the Drawings or in the Contract Documents. The Bidder must satisfy himself regarding the character, quantities, and conditions of the various materials and the work to be done.

It further is agreed and understood that the Bidder or the Contractor will not use any of the information made available to him or obtained in any examination made by him in any manner as a basis or ground of claim or demand of any

nature, against the Town or the Engineer, arising from or by reason of any variance which may exist between the information offered by the actual materials or structures encountered during the construction work, except as may otherwise be provided for in the Contract Documents.

If any work is performed by the Contractor, or any subcontractor, prior to adequate verification of applicable data, any resultant extra cost for adjustment of work necessary to conform to existing conditions, or damage to existing facilities, shall be assumed by the Contractor without reimbursement or compensation by the Town.

COMPLETE WORK REQUIRED: The Drawings, Specifications, and all supplementary documents are essential parts of the Contract, and requirements occurring in one are as binding as though occurring in all. They are intended to be cooperative, to describe and provide for a complete work. In case of discrepancy on the Drawings, figured dimensions shall govern. In case of omissions from the Specifications as to items of equipment and materials or quantities therefore, the Drawings shall govern.

It shall be the responsibility of the Bidder to call to the attention of the Town obvious omissions of such magnitude as to affect the strength, adequacy, function, completeness, or cost of any part of the work in ample time for amendment by Addendum prior to letting date.

ADDENDA AND INTERPRETATIONS: No interpretation of the meaning of the Drawings, Specifications, quantities, or other Bid Documents will be made orally to any Bidder by the Town prior to award of the contract. Every request for such interpretation should be in writing directed to Scott McDonald, Purchasing Agent via email SMcdonald@summervilleesc.gov. To be given consideration, such request must be received at least ten (10) days prior to the date fixed for the opening of Bids. Any and all such interpretations and any supplemental instructions will be made in the form of written Addenda to the Specifications which, if issued, **will be posted on the Town's website** not later than five (5) 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 his Bid as submitted. All Contractors are to create an account with the Town of Summerville to request plans and register for notifications of Addendas. All Addenda so issued shall become part of the Contract Documents which the Contractor shall acknowledge.

ABILITY AND EXPERIENCE OF BIDDER: It is the purpose of the Town not to award this Contract to any Bidder who does not furnish satisfactory evidence that he has the experience of successfully completing projects of this type and magnitude and that he has sufficient capital, equipment, plant, and personnel to enable him to prosecute the work successfully and to complete it in the time

named. **The Contractor must be on South Carolina Department of Transportation prequalified Contractor's list.**

The Town may make such investigation as it deems necessary to determine the ability of the Bidder to perform the work, and the Bidder shall furnish to the Town, under oath if so required, all such information and data for this purpose as the Town may request.

The successful Bidder will be required to construct the work with his own directly employed personnel to an extent not less than thirty percent (30%) of the Contract Amount.

BIDS AND QUALIFICATIONS: Before a Bid is considered for award, the Bidder may be requested by the Town to submit a statement of facts in detail as to his previous experience in performing similar or comparable work, and of his business and technical organization and financial resources and plant available to be used in performing the contemplated work.

TIME FOR COMPLETION: The Bidder must agree to commence work within the time stipulated in the Agreement. The Bidder also must agree to fully complete the project within the time stipulated in the Agreement.

PENALTIES: The Bidder must agree to pay as penalties the amount set forth in the Agreement for each consecutive calendar day that the work is incomplete after the date of completion.

MODIFICATION OF BIDS: Bids may be modified in writing, executed (in the manner that a bid must be executed) and delivered to the place where bids are to be submitted at any time prior to the opening of bids. Telegraphic modifications of the Bid will not be allowed.

WITHDRAWAL OF BIDS: Any Bidder may withdraw his Bid, either personally or by written request, at any time prior to the scheduled time for opening of Bids or authorized postponement thereof.

No Bidder may withdraw his Bid for a period of ninety (90) calendar days after the date set for the opening thereof, and all Bids shall be subject to acceptance by the Town during this period.

IRREGULAR BIDS: A Bid will be considered irregular and may be rejected for any one of the following reasons:

1. If the Bid is on a form other than that furnished by the Town; or if the form is altered or any part detached.

2. If there are unauthorized additions, conditional or alternate bids, or irregularities of any kind which may tend to make the Bid incomplete, indefinite, or ambiguous as to its meaning.
3. If the Bidder adds any provisions reserving the right to accept or reject an award, or to enter into a contract pursuant to an award.
4. If the Bid does not contain a price for each item listed.
5. If the Bid does not contain the aggregate of the Bid, obtained by adding the extended amounts of the various items, if applicable.
6. If the Bid contains obviously unbalanced bid prices.
7. If there is reason to believe that any Bidder is interested in more than one Bid on the same project or that there has been collusion among the Bidders.

DISQUALIFICATION OF BIDDERS: More than one Bid from an individual, a firm or partnership, a corporation or any association, under the same or different names, will not be considered. Reasonable grounds for believing that any Bidder is interested as a principal in more than one Bid for the work contemplated will cause the rejection of all Bids in which such Bidder is believed to be interested. Any or all Bids will be rejected if there is reason to believe that collusion exists among the Bidders. Contracts will be awarded only to responsible Bidders capable of performing the class of work contemplated within the time specified, and having sufficient resources and finances to carry on the work properly. **The Bidder is not currently on South Carolina Department of Transportation prequalified construction contractor's list for bridge and/or highway construction.**

ACCEPTANCE OR REJECTION OF BIDS: The Town reserves the right to reject any and all Bids when such rejection is in the interest of the Town; to reject the Bid of a Bidder who has previously failed to perform properly or complete on time contracts of a similar nature; and to reject the Bid of a Bidder who is not, in the opinion of the Engineer, in a position to perform the Contract. The Town also reserves the right to waive any informalities and technicalities in bidding. The Town may also accept or reject any of the alternates that may be set forth on the Bid.

METHOD OF AWARD: Unless all Bids are rejected, the Contract will be awarded to the lowest responsive, responsible Bidder. A responsive Bidder is defined as one whose Bid is complete and submitted in accordance with the Contract Documents without excisions, exceptions, special conditions or alternate bids (unless specifically requested in the bid form). A responsible Bidder is defined as one who is legally licensed to bid and perform work in the State of South Carolina, maintains a permanent place of business, has adequate

plant equipment to complete the work properly and within the established time limit, has adequate financial status to meet his obligations contingent to the work, is prequalified by South Carolina Department of Transportation, and is considered by the Town and Engineer to be capable of performing the work in accordance with the Contract Documents

NOTICE TO PROCEED: The Notice to Proceed will be issued within one ninety (90) calendar days of the execution of the Agreement by the Town. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the Town and Contractor. If the Notice to Proceed has not been issued within the ninety (90) calendar day period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

ESTIMATED QUANTITIES: Bidders must satisfy themselves of the accuracy of the estimated quantities in the Bid Schedule by examination of the site and a review of the Drawings and Specifications, including Addenda. After Bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the work to be done.

COMPARISON OF BIDS: Bids will be compared on the basis of the prices stated in the Bid. In the event there is a discrepancy between the unit price and/or the computed total amount, the unit price shall govern.

RIGHT TO INCREASE OR DECREASE THE AMOUNT OF WORK: The work comprises approximately the quantities shown on the Drawings. The Town reserves the right to increase or decrease the amount of work under the Contract to the extent of 25% of the work contemplated, at the unit prices quoted in the Bid, without invalidating the Agreement. Further changes may be made, with the written agreement of the Contractor, up to the limits allowed by the prevailing County Procurement Ordinance. Compensation and time of completion affected by the change will be adjusted at the time of ordering such change.

FORM OF BID: All Bids must be submitted on the blank bid form provided therefore and must state the total price and total contract time for which the Bidder will complete the work in accordance with the terms of the Contract Documents. All blank spaces must be filled in and there shall be no interlineations, alterations, or erasures.

The Bid must be signed manually by a principal or an officer duly authorized to make contracts. The Bidder's legal name must be fully stated and the name and title of the person signing must be typed below his signature.

SUBMITTING BIDS: Each Bid must be submitted on the prescribed bid form. All blank spaces for bid prices must be filled in, in ink or typewritten, and the Bid

must be fully completed and executed when submitted. Only one copy of the bid form is required.

Bidders are cautioned that it is the responsibility of each individual Bidder to assure that his Bid is in the possession of the responsible official or his designated alternate prior to the stated time and at the stated place of the bid opening. The Town is not responsible for Bids delayed by mail and/ or delivery services of any nature.

Each Bid must be submitted in an opaque sealed envelope, plainly marked on the outside, addressed and delivered as shown below. If forwarded by mail, the sealed envelope containing the Bid must be enclosed in another envelope addressed to the Town.

Upper Left Hand Corner:

Bidder's Name
Bidder's Address

To:

Town of Summerville
200 South Main Street
Summerville, SC 29483

Attention: Scott McDonald
Purchasing Agent

Lower Left Hand Corner:

Bid for Construction of: North Maple Street Extension Project

South Carolina General Contractor's License No.: ____
Classification: ____
Expiration Date: ____

SECTION 2

Section 2 Documents

Bid Forms

Bid Schedules

Bid Bond

Bidder's Experience Form

Drug-Free Workplace Certification Form

Non-Collusion Affidavit of Bidder

Delinquent Tax Affidavit

BID FORM

TO: Town of Summerville
Attn: Scott McDonald
Purchasing Agent
200 S. Main Street
Summerville, SC 29483

FROM: _____

Phone: _____

Fax No.: _____

of the City of _____ County of _____, and
State of _____, hereinafter called "Bidder".

PROJECT: North Maple Street Extension Project

Bidders:

The Bidder, in compliance with your Advertisement for Bids for the construction of above-referenced project, having examined the Drawings 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 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.

The Bidder declares that he has carefully examined the site of the proposed Work and fully informed and satisfied himself as to the conditions there existing, the character and requirements of the proposed Work, and the difficulties attendant upon its execution, and that he has carefully read and examined the Drawings, the annexed proposed Agreement, and the Specifications and other Contract Documents therein referred to and knows and understands the terms and provisions thereof.

Bidder understands that information relative to existing structures, apparent and latent conditions, and natural phenomena, as furnished to him on the Drawings, in the Contract Documents, or by

the Town or the Engineer, carries no guarantee expressed or implied as to its completeness or accuracy, and he has made due allowance therefore.

He further understands that the quantities of work tabulated in the Bid are only approximate and are subject to increase or decrease as deemed necessary to the performance of the work by the Engineer; and that these quantities as shown will be used in arriving at the total Contract Price and determination of the lowest Bidder.

Bidder hereby agrees to commence work under this contract within 30 days of receipt of the Notice to Proceed and to fully complete the project(s) within 730 consecutive calendar days thereafter.

Bidder also agrees to pay \$2,200.00 a day as penalties for each consecutive calendar day thereafter as hereinafter provided in the General Conditions.

Bidder acknowledges receipt of the following Addenda:

Addendum No. _____ Date _____

Addendum No. _____ Date _____

Addendum No. _____ Date _____

Addendum No. _____ Date _____

BID FORM - ROADWAY

All work performed by the Contractor as essential to the completion of the intent of the Contract Documents shall be paid for in accordance with the Bid Form. No direct payment will be made for work performed which is not shown as a separate Bid Item. All costs shall be included in the various pay items in the Bid Schedule or an amount shown as Total Bid Amount for the work shown on the proposed project plans.

ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE (\$)	TOTAL AMOUNT (\$)
1031000	MOBILIZATION	1	LS		
1032010	BONDS AND INSURANCE	1	LS		
1050800	CONSTRUCTION STAKES, LINES & GRADES	1	EA		
1052000	UTILITY RELOCATION (SEWER)	1	LS		
1071000	TRAFFIC CONTROL	1	LS		
1080300	CPM PROGRESS SCHEDULE	1	LS		
1090200	AS-BUILT CONSTRUCTION PLANS	1	LS		
2012000	CLEARING & GRUBBING WITHIN ROADWAY	1	LS		
2022000	REMOVAL & DISPOSAL ITEM NO. 1	1	LS		
2022000	REMOVAL & DISPOSAL ITEM NO. 2	1	LS		
2022000	REMOVAL & DISPOSAL ITEM NO. 3	1	LS		
2022000	REMOVAL & DISPOSAL ITEM NO. 4	1	LS		
2022000	REMOVAL & DISPOSAL ITEM NO. 5	1	LS		
2022000	REMOVAL & DISPOSAL ITEM NO. 6	1	LS		
2022000	REMOVAL & DISPOSAL ITEM NO. 7	1	LS		
2022000	REMOVAL & DISPOSAL ITEM NO. 8	1	LS		
2022000	REMOVAL & DISPOSAL ITEM NO. 9	1	LS		
2022000	REMOVAL & DISPOSAL ITEM NO. 10	1	LS		
2023000	REMOVAL & DISPOSAL OF EXISTING PAVEMENT	10600	SY		
2025000	REMOVAL & DISPOSAL OF EXISTING ASPHALT PAVEMENT	3626	SY		
2030010	FURNISH AND INSTALL MAILBOX	100	EA		
2031000	UNCLASSIFIED EXCAVATION	15554	CY		
2033000	BORROW EXCAVATION	30697	CY		
2034000	MUCK EXCAVATION	10073	CY		
2034518	18" DIAMETER PIPE ADDITIONAL FOUNDATION WORK	581	LF		
2034524	24" DIAMETER PIPE ADDITIONAL FOUNDATION WORK	391	LF		
2034530	30" DIAMETER PIPE ADDITIONAL FOUNDATION WORK	100	LF		
2034536	36" DIAMETER PIPE ADDITIONAL FOUNDATION WORK	48	LF		
2034560	60" DIAMETER PIPE ADDITIONAL FOUNDATION WORK	146	LF		
2081001	FINE GRADING	38436	SY		
2103000	FLOWABLE FILL	810	CY		
3069900	MAINTENANCE STONE	790	TON		
3100310	HOT MIX ASPHALT BASE COURSE - TYPE A	14006	TON		
4011004	LIQUID ASPHALT BINDER PG64-22	1679	TON		
4012100	FULL DEPTH ASPH. PAV. PATCHING 10"UNIF	110	SY		

BID FORM - ROADWAY

ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE (\$)	TOTAL AMOUNT (\$)
4013990	MILLING EXISTING ASPHALT PAVEMENT (VARIABLE)	3034	SY		
4020320	HOT MIX ASPHALT INTERMEDIATE COURSE TYPE B	11738	TON		
4020330	HOT MIX ASPHALT INTERMEDIATE COURSE TYPE C	230	TON		
4030320	HOT MIX ASPHALT SURFACE COURSE TYPE B	8824	TON		
4030340	HOT MIX ASPHALT SURFACE COURSE TYPE C	184	TON		
6020106	SOLAR LED CHANGEABLE MESSAGE SIGN & DETECTION EQUIPMENT	7	EA		
6021120	PERMANENT CONSTRUCTION SIGNS (GROUND MOUNTED)	1164	SF		
6021125	PERMANENT CONSTRUCTION SIGNS (BARRICADE MOUNTED)	210	SF		
6041200	BARRICADE - TYPE 3	252	LF		
6250005	4" WHITE BROKEN LINES -(GAPS EXCLUDED)-FAST DRY PAINT	7320	LF		
6250010	4" WHITE SOLID LINES (PVT. EDGE LINES)-FAST DRY PAINT	25490	LF		
6250015	8"WHITE SOLID LINES(CROSSWALK&CHANNELIZATION)FAST DRY PAINT	11580	LF		
6250025	24" WHITE SOLID LINES (STOP/DIAGONAL LINES)-FAST DRY PAINT	2299	LF		
6250030	WHITE SINGLE ARROW (LEFT, STRAIGHT, RIGHT)-FAST DRY PAINT	78	EA		
6250035	WHITE WORD MESSAGE "ONLY"-FAST DRY PAINT	66	EA		
6250043	WHITE LANE DROP ARROW (LEFT OR RIGHT)-FAST DRY PAINT	4	EA		
6250045	RAILROAD CROSSING SYMBOLS - FAST DRY PAINT	4	EA		
6250105	4" YELLOW BROKEN LINES(GAPS EXC) - FAST DRY PAINT	3580	LF		
6250110	4"YELLOW SOLID LINE(PVT.EDGE&NO PASSING ZONE)-FAST DRY PAINT	47794	LF		
6250112	6" YELLOW SOLID LINE ON CURB/MEDIAN - FAST DRY PAINT	2685	LF		
6250115	24" YELLOW DIAGONAL LINES - FAST DRY PAINT	235	LF		
6271005	4" WHITE BROKEN LINES(GAPS EXCL.)THERMOPLASTIC- 90 MIL.	3760	LF		
6271010	4" WHITE SOLID LINES (PVT. EDGE LINES) THERMO.- 90 MIL.	4348	LF		
6271015	8" WHITE SOLID LINES THERMOPLASTIC - 125 MIL.	5857	LF		
6271024	24IN X 36IN WHITE TRIANG. YIELD BAR (GAPS EXC)THERMO-125MIL	28	LF		
6271025	24" WHITE SOLID LINES (STOP/DIAG LINES)-THERMO.-125 MIL	1182	LF		
6271030	WHITE SINGLE ARROWS (LT, STRGHT, RT) THERMO.-125 MIL.	41	EA		
6271035	WHITE WORD MESSAGE "ONLY" -THERMOPLASTIC - 125 MIL.	36	EA		
6271043	WHITE LANE DROP ARROW(LT.OR RT.)THERMO-125MIL	2	EA		
6271045	RAILROAD CROSSING SYMBOLS - THERMOPLASTIC - 125 MIL.	2	EA		
6271064	4" YELLOW BROKEN LINES(GAPS EXC)THERMOPLASTIC - 90 MIL.	1918	LF		
6271074	4" YELLOW SOLID LINES(PVT.EDGE LINES) THERMO-90 MIL.	24747	LF		
6300005	PERMANENT CLEAR PAVEMENT MARKERS- MONO-DIR.- 4"X4"	256	EA		
6301005	PERMANENT YELLOW PAVEMENT MARKERS MONO-DIR.- 4"X 4" PERM. YEL.	179	EA		
6301100	PERMANENT YELLOW PAVEMENT MARKERS BI-DIR.- 4"X4"	520	EA		
6510105	FLAT SHEET, TYPE III, FIXED SZ. & MSG. SIGN	366	SF		
6510106	FLAT SHEET, TYPE III, SIZE DETERMINED BY MSG	65.25	SF		
6510108	FLAT SHEET, TYPE XI, SIZE DETERMINED BY MSG, OVERHEAD	86	SF		
6513020	F&I MOUNTING ASSEMBLY FOR F.S. SIGN ERCTD ON MAST ARM	9	EA		
6531210	U-SECTION POST FOR SIGN SUPPORTS - 3P	691	LF		
6551110	SQUARE TUBING POST 12 GAUGE - 1 3/4" X 1 3/4" X 8	204	LF		

BID FORM - ROADWAY

ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE (\$)	TOTAL AMOUNT (\$)
6750213	2.0" SCHEDULE 40 PVC CONDUIT (GRAY W/ PULL STRING)	3000	LF		
6750220	3.0" SCHEDULE 40 PVC CONDUIT (GRAY W/ PULL STRING)	500	LF		
6750248	2.0" SCHEDULE 40 PVC CONDUIT - 90 DEGREE BEND (GRAY W/ PULL STRING)	42	EA		
675024C	3.0" SCHEDULE 40 PVC CONDUIT - 90 DEGREE BEND (GRAY W/ PULL STRING)	6	EA		
6750275	FURNISH & INSTALL 1.0" SCHEDULE 80 PVC CONDUIT	310	LF		
6750278	FURNISH & INSTALL 2.0" SCHEDULE 80 PVC CONDUIT	1350	LF		
675027C	FURNISH & INSTALL 3.0" SCHEDULE 80 PVC CONDUIT	80	LF		
675027S	FURNISH & INSTALL 2.0" SCHD 80 PVC CONDUIT (DIRECTION.BORED)	2290	LF		
6770388	FURNISH & INSTALL NO. 14 COPPER WIRE, 4 CONDUCTOR - BLACK	1005	LF		
6770389	FURNISH & INSTALL NO. 14 COPPER WIRE, 4 CONDUCTOR - GRAY	1005	LF		
6770393	FURNISH & INSTALL NO. 14 COPPER WIRE, 8 CONDUCTOR (BLACK)	1640	LF		
6770394	FURNISH & INSTALL NO. 14 COPPER WIRE, 8 CONDUCTOR (GRAY)	2360	LF		
6770413	FURNISH & INSTL NO. 14 COPPER WIRE,1-CONDUCTOR FOR LOOP WIRE	5250	LF		
6780495	SAWCUT FOR LOOP DETECTOR	2350	LF		
6800499	FURNISH & INSTALL ELECTRICAL SERVICE FOR TRAFFIC SIGNAL	2	EA		
6800518	F&I-13"X24"X18"D.ELEC.FLUSH UNDGRD.ENCLOS-(STR.POLY.CONC.)HD	23	EA		
680052C	F&I-17"X30"X24"D.ELEC.FLUSH UNDGRD.ENCLOS-(STR.POLY.CONC.)HD	3	EA		
6825020	FURNISH & INSTALL - 35' WOOD POLE-CLASS II-CCA TR(0.60)	3	EA		
6825045	FURNISH & INSTALL 3/8" BACK GUY FOR WOOD POLE	3	EA		
682511F	F&I 21' STEEL POLE WITH 56' MAST ARM	1	EA		
682511H	F&I 21' STEEL POLE WITH 60' MAST ARM	3	EA		
682512K	27' STEEL POLE WITH 66' MAST ARM	4	EA		
6825484	FURNISH & INSTALL 10' BREAK-AWAY ALUM PEDESTAL POLE AND BASE	10	EA		
6825486	FURNISH & INSTALL ALUMINUM PEDESTAL POLE CONCRETE FOUNDATION	10	EA		
6845511	F&I - CONTR 332/336 CABINET ASSEMBLY - BASE MOUNTED	3	EA		
6865720	FURNISH & INSTALL -12" 4 SECTION SIGNAL HEAD	5	EA		
6865723	FURNISH & INSTALL - 12" 3 SECTION SIGNAL HEAD	27	EA		
6865783	F&I - 1-WAY-1SECT.(COUNTDOWN HAND/MAN EMBLEM)PED.SIG.HEAD	16	EA		
6865794	F&I-PED PUSH BUTTON MICRO ASSEMBLY(9"X15")AND SIGN(R-10-3E or R10-4	16	EA		
6865830	VEHICLE TRAFFIC SIGNAL HEAD MOUNTING ASSEMBLY FOR SPAN WIRE	8	EA		
6865831	F&I VEHICLE TRAFFIC SINGAL HEAD MOUNTING ASSEMBLY FOR MAST ARM	24	EA		
6865834	BACKPLATE W/ RETROREFL.BORDERS FOR TRAFF. SIG.	32	EA		
6885990	REMOVAL,SALVAGE,&DISP.OF EXISTING TRAF. SIGNAL EQUIPMENT	1	LS		
6886041	INSTALL VIDEO DETECTION SYSTEM INCLUDING LEAD-IN	1	EA		
6886042	FURNISH & INSTALL VIDEO DETECTION CAMERA W/ HARDWARE & LEAD-IN	4	EA		
6887951	FURNISH & INSTALL CONCRETE CABINET FOUNDATION	3	EA		
7141133	18" RC PIPE CUL.-CLASS V	100	LF		
7141141	14"X 23" HORIZONTAL ELLIPTICAL(HE) RC PIPE CUL.-CLASS HE-III	340	LF		
7141142	19"X 30" HORIZONTAL ELLIPTICAL(HE) RC PIPE CUL.-CLASS HE-III	60	LF		
714114D	14"X 23" HORIZONTAL ELLIPTICAL(HE) RC PIPE CUL.-CLASS HE-IV	700	LF		
7143618	18" SMOOTH WALL PIPE	10510	LF		

BID FORM - ROADWAY

ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE (\$)	TOTAL AMOUNT (\$)
7143624	24" SMOOTH WALL PIPE	5128	LF		
7143630	30" SMOOTH WALL PIPE	2000	LF		
7143636	36" SMOOTH WALL PIPE	56	LF		
7143660	60" SMOOTH WALL PIPE	164	LF		
7149999	CLEANING EXISTING PIPE	1500	LF		
7191005	CATCH BASIN -TYPE 1 CB - TYPE 1	5	EA		
7191605	CATCH BASIN -TYPE 16	114	EA		
7191610	CATCH BASIN -TYPE 16 WITH MODIFIED BOX NO.()	7	EA		
7191650	CATCH BASIN -TYPE 18	22	EA		
7191655	CATCH BASIN -TYPE 18 WITH MODIFIED BOX NO.()	2	EA		
7192020	DROP INLET (24" X 36")	48	EA		
7192021	DROP INLET (24" X 36") WITH STANDARD 4' X 4' BOX	8	EA		
7192022	DROP INLET (24" X 36") WITH STANDARD 5' X 5' BOX	2	EA		
7192023	DROP INLET (24" X 36") WITH STANDARD 6' X 6' BOX	2	EA		
7192105	MANHOLE	13	EA		
7192260	48" X 48" JUNCTION BOX	10	EA		
7196000	EXTRA DEPTH OF BOX	36	LF		
7198495	MANHOLE-CONVERT CATCH BASIN	1	EA		
7199100	BEVELING OF PIPE END	67	EA		
7203210	CONCRETE CURB AND GUTTER(2'-0") VERTICAL FACE	19838	LF		
7204100	CONCRETE SIDEWALK(4" UNIFORM)	7871	SY		
7204900	DETECTABLE WARNING MATERIAL	773	SF		
7205000	CONCRETE DRIVEWAY(6" UNIFORM)	2000	SY		
7206000	CONCRETE MEDIAN	785	SY		
7209000	PEDESTRIAN RAMP CONSTRUCTION	1028	SY		
8041010	RIP-RAP (CLASS A)	26	TON		
8041020	RIP-RAP (CLASS B)	675	TON		
8048215	GEOTEXTILE FOR EROSION CONTROL UNDER RIPRAP(CLASS 2)TYPE D	839	SY		
8063100	48"-CHAIN LINK FENCE	250	LF		
8064100	4' WIDE - CHAIN LINK FENCE GATE (48"HT)	2	EA		
8068301	TEMPORARY BARRIER FENCE	1000	LF		
8081000	MOVING ITEM NO. 1	1	LS		
8081000	MOVING ITEM NO. 2	1	LS		
8081000	MOVING ITEM NO. 3	1	LS		
8081000	MOVING ITEM NO. 4	1	LS		
8081000	MOVING ITEM NO. 5	1	LS		
8081000	MOVING ITEM NO. 6	1	LS		
8081000	MOVING ITEM NO. 7	1	LS		
8081000	MOVING ITEM NO. 8	1	LS		
8091010	RIGHT OF WAY MARKER(REBAR AND CAP)	197	EA		
8091050	RIGHT OF WAY PLAT	1	LS		
8100100	PERMANENT COVER	8	ACRE		
8100200	TEMPORARY COVER	15	ACRE		
8101105	COMPOST	2034	CY		

BID FORM - ROADWAY

ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE (\$)	TOTAL AMOUNT (\$)
8101110	STRAW OR HAY MULCH WITH TACKIFIER	20	ACRE		
8104005	FERTILIZER (NITROGEN)	758	LB		
8104010	FERTILIZER (PHOSPHORIC ACID)	758	LB		
8104015	FERTILIZER (POTASH)	758	LB		
8105005	AGRICULTURAL GRANULAR LIME	15164	LB		
8109050	SELECTIVE WATERING	135750	GAL		
8109901	MOWING	46	ACRE		
8131000	SODDING	0.5	MSY		
8151203	HYDRAULIC EROSION CONTROL PRODUCT (HECP) - TYPE 3	25	ACRE		
8152004	INLET STRUCTURE FILTER - TYPE F (WEIGHTED)	2920	LF		
8152006	INLET STRUCTURE FILTER- TYPE F (NON-WEIGHTED)	2780	LF		
8152007	SEDIMENT TUBES FOR DITCH CHECKS	1140	LF		
8153000	SILT FENCE	14150	LF		
8153090	REPLACE/REPAIR SILT FENCE	1405	LF		
8154050	REMOVAL OF SILT RETAINED BY SILT FENCE	3512	LF		
8156205	INLET STRUCTURE FILTER - TYPE D1	58	EA		
8156207	FILTER MATERIAL FOR INLET STRUCTURE FILTER - TYPE D1	110	EA		
8156490	STABILIZED CONSTRUCTION ENTRANCE	1,925	SY		

Roadway Base Bid Subtotal

BID FORM - FORCE MAIN ITEMS

All work performed by the Contractor as essential to the completion of the intent of the Contract Documents shall be paid for in accordance with the Bid Form. No direct payment will be made for work performed which is not shown as a separate Bid Item. All costs shall be included in the various pay items in the Bid Schedule or an amount shown as Total Bid Amount for the work shown on the proposed project plans.

ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE (\$)	TOTAL AMOUNT (\$)
1	MOBILIZATION	1	LS		
4" FORCE MAIN RELOCATION					
2	4" PVC FORCE MAIN	795	LF		
3	4" PVC FORCE MAIN – RESTRAINED JOINT	195	LF		
4	4" PVC FORCE MAIN INSTALLED IN STEEL CASING – RESTRAINED JOINT	210	LF		
5	18" STEEL CASING INSTALLED BY OPEN TRENCH	90	LF		
6	18" STEEL CASING INSTALLED BY JACK AND BORE	120	LF		
7	90° BEND	3	EA		
8	45° BEND	2	EA		
9	22.5° BEND	4	EA		
10	8"X4" REDUCER	1	EA		
11	CONNECTION TO EXISTING FORCE MAIN	1	LS		
12	CONNECTION TO EXISTING MANHOLE	1	LS		
13	LINE EXISTING DISCHARGE MANHOLE AND NEXT TWO DOWNSTREAM MANHOLES	1	LS		
14	ABANDON MANHOLE (STA 8 + 75)	1	LS		
15	AIR RELEASE VALVE IN MANHOLE	1	EA		
SEWER SERVICES ON EXISTING SEWER					
16	6" PVC SEWER SERVICE LATERAL PIPE	1,100	LF		
17	SINGLE CLEAN OUT INSTALLATION	13	EA		
18	DOUBLE CLEAN OUT INSTALLATION	2	EA		
19	SINGLE CLEAN OUT (BETTERMENT)	2	EA		
20	SINGLE CLEAN OUT INTO MANHOLE-CORE (BETTERMENT)	1	EA		
21	DOUBLE CLEAN OUT (BETTERMENT)	1	EA		
22	CLEAN OUT RELOCATION	3	EA		
23	ABANDON CLEAN OUT	4	EA		
24	LOCATING SEWER SERVICE PIPE	20	EA		
25	SEWER SERVICE PIPE ELEVATION CHANGE	3	EA		
8" GRAVITY SEWER EXTENSION (NORTH MAPLE ST.)					
26	8" PVC GRAVITY SEWER (8-10 DEPTH)	49	LF		
27	4' MANHOLE (8-10 DEPTH)	1	EA		
28	CONNECTION TO EXISTING MANHOLE	1	LS		
8" GRAVITY SEWER EXTENSION (US 78/W 5TH N ST.)					
29	8" PVC GRAVITY SEWER (0-6 DEPTH)	582	LF		
30	8" PVC GRAVITY SEWER (6-8 DEPTH)	392	LF		
31	8" PVC GRAVITY SEWER (8-10 DEPTH)	95	LF		
32	4' MANHOLE (0-6 FT DEPTH)	6	EA		
33	4' MANHOLE (6-8 FT DEPTH)	1	EA		
34	4' MANHOLE (8-10 FT DEPTH)	1	EA		
35	DOGHOUSE MANHOLE & TIE IN TO EXISTING	1	LS		
36	DRIVEWAY REMOVAL AND REPAIR – CONCRETE (2 DRIVEWAYS)	23	SY		
37	DRIVEWAY REMOVAL AND REPAIR - ASPHALT	4	SY		
38	DRIVEWAY REMOVAL AND REPAIR - GRAVEL	23	SY		
39	6" PVC SEWER SERVICE LATERAL PIPE	150	LF		
40	SINGLE CLEAN OUT INSTALLATION	7	EA		
41	SINGLE CLEAN OUT INTO MANHOLE-CORE	1	EA		
42	DOUBLE CLEAN OUT INSTALLATION	1	EA		

BID FORM - FORCE MAIN ITEMS

ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE (\$)	TOTAL AMOUNT (\$)
43	ABANDON CLEAN OUT	8	EA		
44	ABANDON 8" GRAVITY SEWER (311 LF)	1	LS		
45	ABANDON MANHOLE (STA 9 + 65)	1	LS		
46	TREE REMOVAL (2 TREES)	1	LS		
SCDOT ROAD WORK FOR FM AND GRAVITY					
47	SCDOT ROAD PAVEMENT CUT AND REPAIR	40	SY		
48	TRAFFIC CONTROL	1	LS		
TESTING					
49	SOIL COMPACTION TESTING	1	LS		

Force Main Base Bid Subtotal

BID FORM TOTALS

Base Bid List and Total

Roadway Base Bid Subtotal:

Force Main Base Bid Subtotal:

Total Cost (Roadway + Force Main):

Total Project Bid:

--

Additions to work and deletions from work shall be paid in accordance with these unit prices.

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

Bidder understands that the Town 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 120 calendar days after the scheduled closed time for receiving bids. This period may be extended by mutual agreement of Bidder and Town.

Upon receipt of written notice of the acceptance of this Bid, Bidder will execute the formal Agreement attached within 10 days, and deliver Surety Bonds and evidence of insurance as required by the General Conditions.

The bid security attached, in the sum of:

_____, (\$_____)

is to become the property of the Town in the event the Agreement and Bonds are not executed within the time above set forth as penalties for the delay and additional expense to the Town caused thereby.

The undersigned declares that his firm is (delete those not applicable):

A corporation organized and existing under the laws of the State of _____.

A partnership consisting of _____

_____.

The undersigned declares that the person or persons signing this proposal is fully authorized to sign the proposal on behalf of the firm listed and to fully bind the firm listed to all the conditions and provisions thereof.

It is agreed that no person or persons or company other than the firm listed below or as otherwise indicated hereinafter has any interest whatsoever in this proposal or the contract that may be entered into as a result thereof, and that in all respects the proposal is legal and fair, submitted in good faith, without collusion or fraud.

Respectfully Submitted:

Contractor

(SEAL - if bid is by a Corporation)

By: _____

(Title)

(Address)

S.C. General Contractor's License No. _____

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 Town of Summerville, 200 S. Main Street, Summerville, SC 29483, hereinafter called the Town,

in the penal sum of _____

Dollars, (\$_____), being not less than five percent (5%) of the amount bid, in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas the Principal has submitted a Bid to the Town of Summerville, which is attached hereto and made a part hereof for the construction of:

North Maple Street Extension Project

NOW, THEREFORE, if said Bid is accepted, the Principal shall execute and deliver a Contract in accordance with the terms of such Bid, and give such bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished therefore. Should Principal fail to execute and deliver the Contract along with the bonds and certificate(s) of insurance, the amount of this security will be forfeited to the Town of Summerville.

PROVIDED, FURTHER, that the said 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 Town may accept such Bid; and said Surety does hereby waive notice of any such extension.

Signed and sealed this ____ day of _____, 2022.

ATTEST:

Principal

(Principal) Secretary (SEAL)

By: _____

Address

Witness as to Principal

Address

Surety

ATTEST:

(Surety) Secretary (SEAL)

By: _____

Attorney-in-Fact

Address

Witness as to Surety

Address

IMPORTANT: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and must be authorized to transact business in the State of South Carolina.

BIDDER'S EXPERIENCE FORM

North Maple Street Extension Project

THIS SHEET IS TO BE COMPLETED AND RETURNED WITH YOUR BID PROPOSAL
(Attach additional sheets, if needed, to provide further explanation.)

Name of Bidder: _____

How many years have you been engaged in the contracting business under your present firm or trade name? _____

Provide a general description of the type of work performed by your company. _____

Have you ever failed to complete any work awarded to you? _____ If so, where and why? _____

Have you ever defaulted on a contract? _____ If so, where and why? _____

The Bidder shall provide, in the space below, references for at least three (3) projects of a similar nature for which comparable work has been performed.

1. Project: _____

Client: _____

Address: _____

Contact Person: _____ Phone: _____

Construction Cost: _____ Year Completed: _____

2. Project: _____

Client: _____

Address: _____

Contact Person: _____ Phone: _____

Construction Cost: _____ Year Completed: _____

3. Project: _____
Client: _____
Address: _____
Contact Person: _____ Phone: _____
Construction Cost: _____ Year Completed: _____

The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Town of Summerville in verification of the recitals comprising this Bidder's Experience Form.

Dated this _____ day of _____, 202_.

Bidder: _____

By: _____

Title: _____

DRUG-FREE WORKPLACE CERTIFICATION FORM

(CONTRACTOR/VENDOR OTHER THAN INDIVIDUALS)

This certification is required by the Drug-Free Workplace Act, Section 44-107-10 et seq. South Carolina Code of Laws (1976, as amended). The regulations require certification by Contractors/Vendors prior to award, that they will maintain a drug-free workplace as defined below.

The certification set out below is a material requirement of fact upon which reliance will be placed when determining the award of contract. False certification or violation of the certification shall be grounds for suspension of payments, suspension or termination of contract, or suspension or debarment from the right to submit bids or proposals for the Town of Summerville projects.

For purposes of this Certification "Drug-Free Workplace" is defined as set forth in Section 44-107-20 (1), South Carolina Code of Law (1976, as amended). The aforesaid Section defines workplace to include any site where work is performed to carry out the Contractor's/Vendor's duties under the Contract. Contractor's/Vendor's employees shall be prohibited from engaging in the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance in accordance with the requirements of the Drug-Free Workplace Act.

By signing this document, the Contractor/Vendor hereby certifies that it will provide a drug-free workplace by:

1. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the Contractor's/Vendor's workplace and specifying the actions that will be taken against employees for violation of the prohibition.
2. Establishing a drug-free awareness program to inform employees about:
 - a) The damages of drug abuse in the workplace.
 - b) The Contractor's/Vendor's policy of maintaining a drug-free workplace.
 - c) Any available drug counseling, rehabilitation, and employee assistance programs; and;
 - d) The penalties that may be imposed upon employees for drug violations.
3. Making it a requirement that each employee to be engaged in the performance of the contract be given a copy of the statement required by paragraph #1 above;

4. Notifying the employee in the statement required by paragraph #1 that, as a condition of employment under the contract, the employee will:
 - a) Abide by the terms of the statement; and
 - b) Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five (5) days after the conviction.
5. Notifying the Town of Summerville within ten (10) days after receiving notice under subparagraph #4-b, from an employee or otherwise receiving actual notice of the conviction.
6. Taking one of the following actions, within thirty (30) days of receiving notice under subparagraph #4-b with respect to any employee who is convicted:
 - a) Taking appropriate personnel action against the employee up to and including termination; or
 - b) Requiring the employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency.
7. Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraph #1, 2, 3, 4, 5, and 6 above.

Project Name: North Maple Street Extension Project

Firm Name: _____

Address: _____

Attest: _____

Signed: _____

Date: _____

Title: _____

NON-COLLUSION AFFIDAVIT OF BIDDER

State of _____)
County of _____)ss.

_____, being first duly sworn, deposes and says that:

1. He is _____ (Owner, partner, officer, representative or agent) of _____, the Bidder that has submitted the attached Bid for;

North Maple Street Extension Project

- 2. He is fully informed regarding the preparation and contents of the attached Bid and all pertinent circumstances regarding such Bid;
- 3. Such Bid is genuine and is not a collusive or sham Bid;
- 4. Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, including this affidavit, has in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from quoting in connection with such Contract, or has in any manner directly or indirectly, sought by agreements or collusion or communication or conference with any other Bidder, firm or person to fix the price of prices in the attached Bid or of any other Bidder, or to fix any overhead, profit or cost element of the bid price or the bid price of any other Bidder or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Town of Summerville, South Carolina, or any person interested in the proposed Contract; and
- 5. The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest.

SIGNED: _____

TITLE: _____

Subscribed and sworn to before me this the

_____ Day of _____, 202_.

Notary Public for _____

My Commission Expires _____.

DELINQUENT TAX AFFIDAVIT

Please note the Procurement Department shall verify that all taxes have been paid to the Town of Summerville by vendors with which they intend to do business. If you owe delinquent taxes your bid may be disqualified from consideration. If you wish to inquire as to your tax status, you may contact the Berkeley County Delinquent Tax Office at one of the following numbers:

Moncks Corner	(843) 719-4030	
Charleston	(843) 723-3800	extension 4030
St. Stephen	(843) 567-3136	extension 4030

IS YOUR BUSINESS DELINQUENT IN PAYING ANY TAXES OWED TO BERKELEY COUNTY? _____(YES OR NO).

BIDDER SIGNATURE:_____

BIDDER NAME:_____

POSITION:_____

FIRM NAME:_____

ADDRESS:_____

TELEPHONE:_____

Subscribed and sworn to before me this _____ day of _____, 202_.

_____ My Commission

Expires _____
NOTARY PUBLIC
STATE OF SOUTH CAROLINA

SECTION 3

Section 3 Contract Forms

Notice of Award

Agreement

Performance Bond

Payment Bond

NOTICE OF AWARD

To: (Contractor)

Project: North Maple Street Extension Project

The Town of Summerville has considered the Bid submitted by you on _____ 2022, for the above described Project in response to its Advertisement for Bids and Information for Bidders.

You are hereby notified that your Bid has been accepted for items in the amount of \$_____ for a Total Construction time of _____ days.

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, the Town will be entitled to consider all your rights arising out of the Town's acceptance of your Bid as abandoned and as forfeiture of your Bid Bond. The Town 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 Town.

Dated this ____ day of _____, 202_.

Town of Summerville
By: Scott McDonald
Title: Purchasing Agent

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by

_____ on this the ____ day of _____, 202_.
(Contractor)

By: _____ Title: _____

AGREEMENT

THIS AGREEMENT, made this [] Day of [], by and between the Owner The Town of Summerville, hereinafter called "Town" and [], hereinafter called "Contractor".

Town and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

Article 1. PROJECT

Contractor shall complete all work as specified or indicated in the Contract Documents. The Project, for which the work specified, is generally described as:

North Maple Street Extension Project

Article 2. ENGINEER

The Project has been designed by

MICHAEL BAKER INTERNATIONAL INCORPORATED
700 Huger Street
Columbia, South Carolina 29201

who is hereinafter called Engineer and who is to assume all duties and responsibilities and have the rights and authority assigned to Engineer in the Contract Documents in connection with completion of the work in accordance with the Contract Documents.

Article 3. CONTRACT TIME

3.1 The Work will be complete within **730 calendar days** from the effective Notice to Proceed. This 730 consecutive calendar days shall include a specified 180-day utility window, established by the Town, that starts after clearing and grubbing operations. The Contractor shall be complete with the clearing and grubbing operations no later than March 31, 2023. The Town Engineer shall establish the beginning and end date of the utility windows. In addition, work that will require railroad flagging operations and on the railroad's property shall be complete in 180 consecutive calendar days. If flagging operations are required for more than 180 consecutive calendar days, it will be at the contractor's expense.

3.2 Town and Contractor recognize that time is of the essence for this Agreement and that the Town will suffer financial loss if the work is not finally complete within the time specified above. They also recognize the delays, expense and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the Town if the work is not completed on time. Accordingly, instead of requiring any such proof, Town and Contractor agree that as penalties for delay Contractor shall pay the Town **Two Thousand Two Hundred Dollars (\$2,200.00)** for each calendar day that expires after the time specified in paragraph 3.1 for final completion of work.

- 3.3 Contractor understands and hereby expressly agrees that in addition to delay penalty specified in Article 3.2 above, to pay the Town the actual costs to Town for any inspector or inspectors necessarily employed by Town on the work and the actual costs to Town for the observation of construction and project representative services including all travel and subsistence expenses after the date specified for completion until the work is completed and ready for final payment. Further, the Contractor agrees that the sums to be paid the Town may be deducted from the sum due the Contractor for work performed as provided in the General Conditions. Further, the Contractor agrees to pay the penalties provided in these contract documents.

Article 4. CONTRACT PRICE.

- 4.1.1.1 Town shall pay Contractor for completion of the work in accordance with the Contract Documents, and in accordance with the unit bid prices submitted on [REDACTED] with an initial contract amount of \$ [REDACTED].

Article 5. PAYMENT PROCEDURES.

Contractor shall submit Applications for Payment in accordance with the General Conditions, but in no case shall submit Applications for Payment more than once per month. Applications for Payment will be processed by Town as provided in the General Conditions.

- 5.1 Payment will be made within thirty (30) days after acceptance of completed work in accordance with the payment schedule. Payment application for construction contracts are to be submitted on an AIA Application for Payment form, or similar form acceptable to Town. Application for payment shall reflect work completed through the last day of the month. Retainage for construction contracts will be as follows: 10%. Partial payments will be made as follows: Provided an application for payment is received by the Project Manager no later than the 10th of the month, the Town shall make payment to the Contractor not later than the 30th day of the same month. If an application for payment is received after the 10th day of the month, payment shall be made by the Town no later than 20 days after the Project Manager receives the application for payment.
- 5.2 Upon final completion and acceptance of the work in accordance with the General Conditions, Town shall pay the remainder of the contract price as recommended by the Project Manager.

Article 6. CONTRACTOR'S REPRESENTATIONS.

In order to induce Town to enter into this Agreement, Contractor makes the following representations:

- 6.1 Contractor has familiarized itself with the nature and extent of the Contract Documents, work, site, locality, and all local conditions and laws and regulations that in any manner may affect cost, progress, performance or furnishing of the work.

- 6.2 Contractor has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all available examinations, investigations, explorations, tests, reports and studies which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise may affect the cost, progress, performance or furnishing of the work as Contractor considers necessary for the performance or furnishing of the work at the contract price, within the contract time and in accordance with the other terms and conditions of the Contract Documents, and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by Contractor for such purposes.
- 6.3 Contractor has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing underground facilities at or contiguous to the site and assumes responsibility for the accurate location of said underground facilities.
- 6.4 Contractor has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.
- 6.5 Contractor has given Town written notice of all conflicts, error or discrepancies that he has discovered in the Contract Documents and the written resolution thereof by Town is acceptable to Contractor.

Article 7. CONTRACT DOCUMENTS.

The Contract Documents which comprise the entire agreement between Town and Contractor concerning the work consist of the following:

- 7.1 This Agreement.
- 7.2 Invitation for Bids.
- 7.3 Information for Bidders.
- 7.4 Notice of Award.
- 7.5 Performance and Payment Bonds.
- 7.6 Addendum Number _____.
- 7.7 General Conditions
- 7.8 Special Provisions
- 7.9 Attachment A – North Maple Special Provisions and Utility Window.
- 7.10 Attachment B – In-contract DCW&S Bid Package / Standard Specifications Signal Special Provisions.

- 7.11 Attachment C: Norfolk Southern- Special Provisions for Protection of Railway Interests,
- 7.12 Attachment D: Norfolk Southern - Contractor Right of Entry Agreement
- 7.13 Attachment E: Norfolk Southern – Railroad Signal Plans (For Information Only)
- 7.14 Attachment F: Norfolk Southern Checklist for Construction
- 7.15 Attachment G: Permits
- 7.16 Contractor's Bid.
- 7.17 All written amendments and other documents amending, modifying or supplementing the Contract Documents, which may be delivered or issued after the effective date of the Agreement and not attached hereto.
- 7.18 Drawings prepared by the Engineer.
- 7.19 There are no Contract Documents other than those listed in this Article 7. The Contract Documents may only be amended, modified or supplemented as provided in the General Conditions.

Article 8. MISCELLANEOUS.

- 8.1 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically, but without limitation, monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.
- 8.2 Town and Contractor each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.
- 8.3 The Contractor will be allowed fuel or asphalt adjustment indexing on this project in accordance with SCDOT specifications.

IN WITNESS WHEREOF, the parties hereto have executed or caused to be executed by their duly authorized officials, this Agreement in three (3) counterparts, each of which shall be deemed an original, in the year and day first above written.

TOWN OF SUMMERSVILLE

By: _____
Lisa Wallace
Town Administrator

(SEAL)

ATTEST:

(Secretary)

(Witness)



By: _____

Name: _____

Title: _____

Address: 

Phone: 

Fax: 

(SEAL)

ATTEST:

(Secretary)

(Witness)

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS that

(Name of Contractor)

(Address of Contractor)

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

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto Town of Summerville, 200 S. Main Street, Summerville, SC 29483 hereinafter called Town, in the penal sum of _____ Dollars, (\$ _____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, 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 Town, dated the _____ day of _____, 2022, a copy of which is hereto attached and made a part hereof for the construction of:

North Maple Street Extension Project

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 extension thereof which may be granted by the Town, with or without notice to the Surety, and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the Town from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Town all outlay and expense which the Town 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, extension of time, alteration or additions to the terms of the contract or to the work to be performed hereunder or the specifications accompanying the same shall in any wise affect its obligation of 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 Town and the Contractor shall abridge the right of any beneficiary hereunder whose claim may be unsatisfied.

Whenever the Contractor shall be, and declared by Town to be, in default under the Contract, the Town having performed Town's obligations thereunder, the Surety may promptly remedy the default; or shall promptly complete the Contract in accordance with its terms and conditions; or shall obtain a bid or bids for completing the Contract in accordance with its terms and conditions, arrange for a contract between such bidder and the Town, and make available sufficient funds to pay the cost of completion less the balance of the Contract price. The term "balance of the Contract price", as used in this paragraph, shall mean the total amount payable by the Town to the Contractor under the Contract and any amendments thereto, less the amount properly paid by Owner to Contractor.

IN WITNESS WHEREOF, this instrument is executed in three (3) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 2022.

ATTEST:

(Principal) Secretary (SEAL)

Witness as to Principal

Address

ATTEST:

(Surety) Secretary (SEAL)

Witness as to Surety

Address

Principal

By: _____

Address

Surety

By: _____

Attorney-in-Fact

Address

NOTE: Date of Bond must not be prior to the date of the Contract. If Contractor is a Partnership, all partners shall execute the Bond.

IMPORTANT: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and must be authorized to transact business in the State of South Carolina.

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS that

(Name of Contractor)

(Address of Contractor)

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

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto the Town of Summerville, 200 S. Main Street, Summerville, SC 29483, hereinafter called Town, in the penal sum of _____ Dollars, (\$ _____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, 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 Town, dated the _____ day of _____, 2022, a copy of which is hereto attached and made a part hereof for the construction of :

North Maple Street Extension Project

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 Project provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials used or reasonably required for use 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, extension of time, alteration or additions to the terms of the contract or to the work to be performed hereunder or the specifications accompanying the same shall in any wise 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 Town and the Contractor shall abridge the right of any beneficiary hereunder whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in three (3) counterparts, each one

of which shall be deemed an original, this the ____ day of _____, 2022.

ATTEST:

Principal

(Principal) Secretary (SEAL)

By: _____

Address

Witness as to Principal

Address

Surety

ATTEST:

(Surety) Secretary (SEAL)

By: _____

Attorney-in-Fact

Address

Witness as to Surety

Address

NOTE: Date of Bond must not be prior to the date of the Contract. If Contractor is a Partnership, all partners shall execute the Bond.

IMPORTANT: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and must be authorized to transact business in the State of South Carolina.

SECTION 4

Section 4 Documents:

Affidavit of Payment

Affidavit of Release of Lien

Final Waiver of Lien

Contractor Warranty Form

Consent of Surety of Final Payment

AFFIDAVIT OF PAYMENT

To All Whom It May Concern:

WHEREAS, the undersigned has been employed by _____ to furnish labor and materials for _____ work, under a contract _____ for the improvement of property described as North Maple Street Extension Project in the County of Dorchester, State of **South Carolina** of which the government of **Town of Summerville, South Carolina**, located at **200 S. Main Street, Summerville, South Carolina 29483** is the Owner,

NOW, THEREFORE, this _____ day of _____

The undersigned, as the Contractor for the above named Contract pursuant to the Conditions of the Contract hereby certified that, except as listed below, has paid in full or has otherwise satisfied all obligations for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or its property might in any way be held responsible.

EXCEPTIONS:(If none, write "None". The Contractor shall furnish a bond satisfactory to the Owner for each exception.)

ATTACHMENTS:

- 1. Consent of Surety to Final Payment. (Whenever Surety is involved, Consent of Surety is required.)
- 2. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
- 3. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers.
- 4. Contractors Affidavit of Release of Liens.

(SEAL)

CONTRACTOR
(Name of sole ownership, corporation
or partnership)

(Print name of Agent/Authorized Representative)

(SEAL)

(Signature of Authorized Representative (Agent))

(Affix corporate seal here)

TITLE _____

AFFIDAVIT OF RELEASE OF LIEN

To All Whom It May Concern:

WHEREAS, the undersigned has been employed by _____ to furnish labor and materials for _____ work, under a contract _____ for the improvement of property described as North Maple Street Extension Project in the County of Dorchester, State of **South Carolina** of which the government of **Town of Summerville, South Carolina**, located at **200 S. Main Street, Summerville, South Carolina, 29483** is the Owner,

NOW, THEREFORE, this _____ day of _____

The undersigned, as the Contractor for the above-named Contract pursuant to the Conditions of the Contract hereby certifies that to the best of his/her knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services, who have or may have liens against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

EXCEPTIONS: (If none, write "None". The Contractor shall furnish a bond satisfactory to the Owner for each exception.)

ATTACHMENTS:

- 1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
- 2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers.

(SEAL)

CONTRACTOR
(Name of sole ownership, corporation)
or partnership)

(Print name of Agent/Authorized Representative)

(SEAL)

(Signature of Authorized Representative (Agent))

(Affix corporate seal here)

TITLE _____

FINAL WAIVER OF LIEN

To All Whom It May Concern:

WHEREAS, the undersigned has been employed by _____ to furnish labor and materials for _____ work, under a contract _____ for the improvement of property described as North Maple Street Extension Project in the County of Dorchester, State of **South Carolina** of which the government of **Town of Summerville, South Carolina**, located at **200 S. Main Street, Summerville, South Carolina, 29483** is the Owner,

NOW, THEREFORE, this _____ day of _____

for and in consideration of the sum of (\$) _____ Dollars paid simultaneously herewith, the receipt whereof is hereby acknowledged by the undersigned, the undersigned does hereby waive and release any lien rights to, or claim of lien with respect to and on said above-described premises, and the improvements thereon, and on the monies or other considerations due to become due from the owner, on account of labor, services, material, fixtures, apparatus of machinery heretofore or which may hereafter be furnished by the undersigned to or for the above-described premises by virtue of said contract.

(SEAL)
or partnership)

CONTRACTOR (Name of sole ownership, corporation

(Print name of Agent/Authorized Representative)

(SEAL)
(Affix corporate seal here)

(Signature of Authorized Representative (Agent)

TITLE _____

INSTRUCTIONS FOR FINAL WAIVER

- (A) Person or company with whom you agreed to furnish either labor, or services, or materials, or both.
- (B) Fill in nature and extent of work; strike the word labor or the word materials if not in your contract.
- (C) If you have more than one contract on the same premises, describe the contract by number if available, date and extent of work.
- (D) Furnish an accurate enough description of the improvement and location of the premises so that it can be distinguished from any other property.
- (E) Amount shown should be the amount actually received and equal to total amount of contract as adjusted.
- (F) If waiver is for a corporation, corporate name should be used, corporate seal affixed and title of officer signing waiver should be set forth; if waiver is for a partnership, the partnership name should be used, partner should sign and designate himself as partner.

CONTRACTOR WARRANTY FORM

PROJECT: North Maple Street Extension Project

LOCATION: Dorchester County, South Carolina

OWNER: Town of Summerville

Contractor (Company Name) _____ for the above-referenced project, do hereby warrant all labor and materials furnished and work performed are in accordance with the Contract Documents and authorized modifications thereto, and will be free from defects due to defective materials or workmanship for a period of two (2) years from Date of Completion. This warranty commences on _____ Date of Completion and expires on _____

This warranty covers the entire project.

Should any defect develop during the warranty period due to improper materials, workmanship or arrangement, the defect shall, upon written notice by the Owner, be made good by the Undersigned at no expense to the Owner.

Nothing in the above shall be deemed to apply to work, which has been abused or neglected by the Owner.

DATE

(SEAL)

CONTRACTOR
(Name of sole ownership, corporation)
or partnership

(Print name of Agent/Authorized Representative)

(SEAL)

(Signature of Authorized Representative (Agent))

(Affix corporate seal here)

TITLE _____

CONSENT OF SURETY FOR FINAL PAYMENT

Project Name: North Maple Street Extension Project

Location: Dorchester County, South Carolina

Project No.

Type of Contract _____

Amount of Contract _____

In accordance with the provisions of the above-named contact between the Owner and the Contractor, the following named surety:

on the Payment Bond of the following named Contractor:

hereby approves of final payment to the Contractor, and further agrees that said final payment to the Contractor shall not relieve the Surety Company named herein of any of its obligations to the following named Owner: as set forth in said Surety company's bond:

IN WITNESS WHEREOF, the Surety Company has hereunto set its hand and seal this _____ day of _____

(Name of Surety Company)

(Affix corporate seal here)
(Signature of Authorized Representative)

TITLE

IF SIGNED BY ATTORNEY-IN-FACT, POWER OF ATTORNEY IS REQUIRED

SECTION 5

Section 5 Documents:

General Conditions

GENERAL CONDITIONS

1. GENERAL PROVISIONS

1.1 THE CONTRACT DOCUMENTS: The Contract Documents consist of the Advertisement for Bids, Information for Bidders, Bid, Bid Bond, Agreement, Payment Bond, Performance Bond, Conditions of the Contract (General Conditions, Project Notes, Special Conditions, Supplemental and Other Conditions), Drawings (the Construction Plans), Technical Specifications, Addenda, Special Provisions, Supplemental Specifications, Supplemental Technical Specifications, Notice of Award, Notice to Proceed, Change Orders, North Maple Special Provisions and Utility Window, In-contract DCW&S Bid Package / Standard Specifications, Norfolk Southern- Special Provisions for Protection of Railway Interests, Norfolk Southern - Contractor Right of Entry Agreement, Norfolk Southern-Railroad Signal Plans.

1.2 CORRELATION AND INTENT OF DOCUMENTS: The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all.

The intent of the Drawings and Specifications is that the Contractor shall furnish all labor, supplies and materials, tools, machinery, equipment, transportation, supervision, temporary construction of any nature, and all other services, facilities and means necessary for the proper execution and completion of the Work in accordance with the Contract Documents and all incidental work necessary to complete the Project in an acceptable manner, and fully complete the work or improvement ready for use, occupancy and operation by the Town.

Any mention in the Specifications or indication on the Drawings of articles, materials, methods or operations shall require the Contractor to furnish such item or service as if it was fully specified unless it is noted or specified as not in the contract. It is intended that all materials shall be new and best quality in every respect unless otherwise noted or specified. All workmanship, methods of assembly, and erection shall be first class in every respect.

1.3 CONFLICT OR INCONSISTENCY: If there is any conflict or inconsistency between the provisions of the Supplemental Conditions and the provisions of the other Contract Documents, the provisions of the Supplemental Conditions shall prevail. If there is any conflict or inconsistency between the provisions of the General Conditions and the provisions of any of the Contract Documents other than the Supplemental Conditions, the provisions of the General Conditions shall prevail.

In case of conflict between the Drawings and Specifications, the Specifications shall govern. Figure dimensions on Drawings shall govern over scale dimensions, and detailed Drawings shall govern over general Drawings.

In case of difference between small-scale and large-scale drawings, the large scale drawings shall govern. Schedules on any contract drawing shall take precedence over conflicting information on that or any other contract drawing. On any of the drawings where a portion of the work is detailed or drawn out and the remainder is shown in outline, the parts detailed or drawn out shall apply also to all other like portions of the work. Where the word "similar" occurs on the drawings, it shall have a general meaning and not be interpreted as being identical, and all details shall be worked out in relation to their location and their connection with other parts of the work.

Any discrepancies found between the Drawings and Specifications and site conditions or any inconsistencies or ambiguities in the Drawings or Specifications shall be immediately reported to the Town, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. Work done by the Contractor after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the Contractor's risk.

Should a conflict be discovered within the Contract Documents, the Contractor shall be deemed to have estimated the higher quality way of doing the Work unless he shall have asked for and obtained a decision in writing from the Town before entering into this Contract.

1.4 ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS: The Contractor may be furnished additional instructions and detail drawings, by the Town, as necessary to carry out the Work required by the Contract Documents. The additional drawings and instructions thus supplied will become a part of the Contract Documents. The Contractor shall carry out the Work in accordance with the additional detail drawings and instructions.

1.5 SPECIFICATION HEADINGS: For convenience of reference, these Specifications are divided into various Divisions, Sections, Subsections and Paragraphs. The titles of these headings shall not be taken as a correct or complete segregation of the various types of material and labor nor as an attempt to outline jurisdictional procedures. The headings shall not be deemed to limit or restrict the content, meaning or effect of such section, subsection, paragraph, provision or part.

The organization of the Specifications into the various headings, and the arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade. Each subcontract shall be dependent upon its own definite confines, regardless of Divisions of these Specifications. No responsibility, either direct or implied, is assumed by the Town for omissions or duplications by the Contractor or by any of his subcontractors due to real or alleged errors in arrangement of matter in Contract Documents.

1.6 DRAWINGS AND SPECIFICATIONS FOR CONSTRUCTION PURPOSES: The Contractor will be furnished four (4) complete sets of Drawings and Specifications to be used during the course of construction. If more than four (4) sets are needed, the Contractor will be required to pay the actual cost of printing and handling.

1.7 DEFINITIONS: Wherever the words hereinafter defined or pronouns used in their stead occur in the Contract Documents, they shall have the following meanings:

ACCELERATION AND DECELERATION LANES: The Acceleration and Deceleration Lanes are the portions of the roadway adjoining the main traveled way consisting of tapers, widened areas or auxiliary lanes which function as speed change lanes, turning lanes, and segments of traffic interchange connections.

ADDENDA: Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the Contract Document, Drawings and Specifications by additions, deletions, clarifications or corrections. Such addenda will take precedent over the position of the general drawings and specifications concerned and will be considered as part of the Contract Documents.

ADVERTISEMENT: The Advertisement is the official notice published publicly announcing a letting of highway construction projects, inviting bids, and carrying information concerning the date and time of the opening of bids and other pertinent information

AGREEMENT: The Agreement represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations or agreements, either written or oral, including the bidding documents. The Agreement may be amended or modified by a Change Order.

AWARD: The Award of a Contract is made by official letter from the Town of Summerville notifying the successful low bidder that the proposed work has been awarded to the Bidder, and authorizing

work to begin upon the execution and approval of a satisfactory contract together with bonds to secure the performance of the work and assure the payment of all legal debts pertaining to the performance of the work, a certificate of insurance as proof of the required insurance, and such other conditions as specified or otherwise required by law.

BASE COURSE: The Base Course is the layer or layers of specified material of designated thickness or rate of application placed on a subbase or subgrade to support subsequent layers of the pavement structure.

BID or BID PROPOSAL: The written offer or proposal of the Bidder, submitted on the prescribed form, properly signed and guaranteed, to perform the work at the prices quoted by the Bidder.

BID BOND: The security furnished by the Bidder with his proposal for the Project is guaranty he will enter into a contract for the work if his proposal is accepted.

BIDDER: Any individual, firm or corporation or combination of same submitting a bid for the work contemplated, acting directly or through a duly authorized representative.

BRIDGE: A Bridge is a structure, including supports, erected over a depression or an obstruction, such as water, highway, or railway; having a track or passageway for carrying traffic or other moving loads; and having a length measured along the center of roadway of more than 20 feet. The length of a Bridge is the overall length measured along the longitudinal centerline between under copings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening. The width is the clear width between the bottoms of curbs measured at right angles to the longitudinal centerline.

BONDS: Bid, Performance and Payment Bonds and other instruments of security furnished by the Contractor and his Surety in accordance with the Contract Documents.

CALENDAR DAY: Every day shown on the calendar, Sundays and holidays included.

CHANGE ORDER: A written order to the Contractor authorizing an addition, deletion or revision in the Work within the general scope of the Contract Documents, or authorizing an adjustment in the Contract Price or Contract Time.

CHANNEL: A Channel is a natural or artificial watercourse.

CONSTRUCTION ESTIMATE: A Construction Estimate is an official written itemization of the value of materials in-place and work performed according to which the Contractor is paid. A Construction Estimate may also be referred to as a Progress Estimate or the Final Estimate.

CONTRACT: The Contract Documents form the Contract. The Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations or agreements, either written or oral, including the bidding documents. The Contract may be amended or modified by a Change Order.

CONTRACT BOND: A Contract Bond is the approved form of security, executed by the Contractor and its surety or sureties, guaranteeing complete execution of the Contract and all Change Orders pertaining thereto, and the payment of all legal debts pertaining to the performance of the work.

CONTRACT DOCUMENTS: The Contract Documents consist of the Advertisement for Bids, Information for Bidders, Bid, Bid Bond, Agreement, Payment Bond, Performance Bond, the Conditions of the Contract (General, Supplemental, and other Conditions), the Drawings, the Specifications, Addenda issued prior to execution of the Contract, Notice of Award, Notice to Proceed and Change Orders.

CONTRACT ITEM (or PAY ITEM or BID ITEM): A Contract Item may be referred to as a Pay Item or Bid Item and is an item of specifically described work for which a price, either unit or lump sum, is provided in the contract. It includes the performance of all work and the furnishing of all materials, labor, equipment, tools, supplies, and fuel described in the text of a specified item included in the contract.

Contract Items have a unique 7 digit Item Number. Generally, the first 3 digits correspond to a section of these Standard Specifications. The remaining 4 digits are for individual identification of each contract item

CONTRACT PRICE: The total monies payable to the Contractor under the terms and conditions of the Contract Documents.

CONTRACT TIME: The number of calendar days stated in the Contract Documents for the completion of the Work. Contract Time is the number of calendars days between the Notice to Proceed and date of Final Completion of Work including authorized time extensions.

CONTRACT COMPLETION DATE: The Contract Completion Date is the date specified in the Contract for Final completion of the work. This date will be 730 calendar days beyond the substantial completion date.

CONTRACTOR: The individual, firm or corporation with whom the Town has executed the Agreement by which the Contractor is obligated directly, or through Subcontractors, to perform work in connection with the Project.

The Contractor is the person or organization identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or his authorized representative.

CROSSOVER: A Crossover is a travelway connecting two travelways of a divided highway and provides for the movement of traffic across or between the travelways.

CULVERT: A Culvert is structure that provides an opening or conduit under a roadway or fill, generally for the passage of water, and includes pipe culverts and any structure so named on the Plans.

DESIGNER OF RECORD: The Designer or Designer of Record is the Professional Engineer or Engineering Firm registered in South Carolina that performs the engineering design and analysis and is responsible for the plans and specifications for the project

DRAWINGS: The part of the Contract Documents which show the characteristics and scope of the Work to be performed and which have been prepared or approved by the Engineer.

EARTH: An excavated material or material to be excavated; all kinds of material other than rock.

ELEVATION: The figures given on the Drawings or in the other Contract Documents after the word "elevation" or abbreviation of it shall mean the distance in feet above the datum adopted by the Engineer.

ENGINEER: The person, firm or corporation named as such in the Contract Documents and duly appointed by the Town to undertake the duties and powers herein assigned to the Engineer, acting either directly or through duly authorized representatives.

EQUIPMENT: All machinery, together with the necessary supplies for operation, upkeep, and maintenance, and all tools and apparatus necessary for the proper construction and acceptable completion of the work.

EXTENSION: An Extension or Contract Extension is additional work added to a contract outside of the limits of the original contract

EXTRA WORK: Extra Work is additional work performed and/or additional material furnished beyond the original scope of the contract, and is duly authorized and necessary for proper completion of the improvement, but is not covered by any item in the contract, and for which, there is no means of payment, direct or indirect, provided in the contract. Such Extra Work is performed at duly negotiated prices in a written Change Order. Change Order must be signed by all parties prior to additional work commencing, including work completed by sub contractors.

FIELD ORDER: A written order effecting a change in the Work not involving an adjustment in the Contract Price or an extension of the Contract Time, issued by the Town to the Contractor during construction.

FURNISH: Provide and install complete, in place, and ready for use.

HIGHWAY: Highway is a general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way. In general, this term is synonymous with "road" and "street."

INFORMATION FOR BIDDERS: The notice to contractors containing all necessary information as to provisions, requirements, date, place, and time of submitting bids.

INSPECTOR: The Inspector is the authorized representative of the TOWN as assigned to make detailed inspections of materials and/or contract performance.

LABORATORY: A Laboratory is an accredited materials and testing laboratory acceptable to the South Carolina Department of Transportation and the Town.

LATEST EDITION: The current printed document issued eight weeks or more prior to date of receipt of bids.

LETTING: The Letting is the public opening of sealed bids for highway construction work.

LUMP SUM: A Lump Sum is a bidding unit that includes the total cost to complete all work described under a single contract item (pay item). It includes all material, labor, equipment, tools, supplies and fuel costs plus all overhead, profit, and any other direct or indirect cost or expense necessary for the satisfactory performance and completion the work for that bid item.

MATERIALS: Any substance specified for use in the construction of the Project and its appurtenances.

MEDIAN: The Median is the portion of a divided highway between the travelways of traffic in opposite directions.

NET COST: The cost to the Contractor after application of all credits and discounts (excepting only cash discounts) and without the addition of any factor for burden, overhead or indirect cost or profit.

NOTICE OF AWARD: The written notice of the acceptance of the Bid from the Town to the successful Bidder.

NOTICE TO PROCEED: Written communication issued by the Town to the Contractor authorizing him to proceed with the Work and establishing the date of commencement of the Work.

OPTIMUM MOISTURE CONTENT FOR COMPACTION: The moisture content of a soil calculated on the basis of dry weight of soil at which the soil can be compacted to the approximate maximum density under a specified standard method of compaction.

OMR: This mean South Carolina Department of Transportation Office of Materials and Research.

PAVEMENT: Pavement is the uppermost layer of material placed on the travelway, shoulder, or both, usually placed as the wearing or riding surface. This term is used interchangeably with surface or surfacing.

PAVEMENT STRUCTURE: The Pavement Structure is the combination of the subbase, base, pavement, or other specified layer placed on the subgrade to support the traffic load and distribute it to the roadbed.

PAYMENT BOND: The approved form of security furnished by the Contractor to guarantee the payment to all persons supplying labor and materials in the prosecution of the work in accordance with the terms of the Contract.

PERFORMANCE BOND: The approved form of security furnished by the Contractor to guarantee the completion of the work in accordance with the terms of the Contract.

PLANS (or Design Plans): The Plans or Design Plans are the official approved engineering drawings including profiles, cross-sections, strip maps, and supplemental drawings, or exact reproductions thereof that show the location, character, dimensions, and details of the work to be done.

PRECONSTRUCTION CONFERENCE: A conference following award and prior to start of construction to be attended by a duly authorized representative of the Town and by the responsible officials of the Contractor and other affected parties.

PROJECT: The undertaking to be performed as provided in the Contract Documents.

PROJECT COMPLETION: That date, as certified by the Town, as evidenced on the Final Payment Request, when the Work is completed in accordance with the Contract Documents.

PROJECT NOTES: Additional direction to the Contractor in addition to or other than what has been described in the General Conditions.

PROPOSAL: The written offer of the Bidder, submitted on the prescribed form, properly signed and guaranteed, to perform the work at the prices quoted by the Bidder.

PROPOSAL FORM: The approved form on which the Town requires formal bids to be prepared and submitted for the work.

PROPOSAL GUARANTY: The security furnished by the Bidder with his proposal for a Project, as guaranty he will enter into a contract for the work if his proposal is accepted.

PROVIDE: Furnish and install complete, in place, and ready for use.

RAMP: A Ramp is a connecting travelway between two intersecting highways, usually at a highway grade separation. Entrances to properties may also be referred to as ramps

RIGHT-OF-WAY: The Right-of-Way refers to the land secured and reserved by the TOWN or SCDOT for the construction, improvement, and maintenance of the highway.

ROAD: Road is a general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way. In general, this term is synonymous with "highway" and "street."

ROADBED: The Roadbed is the graded portion of a highway between the outside shoulder lines, prepared as a foundation for the pavement structure, median, and shoulders. Extensive areas between the roadbeds of divided highways will not be considered roadbed.

ROADSIDE: The Roadside is the portion of the highway outside the roadway.

ROADWAY: The Roadway is that portion of the highway lying within the limits of construction.

ROCK: An excavated material or material to be excavated; only boulders and pieces of concrete or masonry exceeding 2 cu. yd. in volume, or solid ledge rock which, for its removal, requires drilling and blasting, wedging, sledging, barring, or breaking up with a power-operated tool. No soft or disintegrated rock which can be removed with hand pick or power-operated excavator or shovel, no loose shaken, or previously blasted rock or broken stone in rock fillings or elsewhere, and no rock exterior to the maximum limits of measurement allowed, which may fall into the excavation will be classified as rock.

SCDOT: This means South Carolina Department of Transportation.

SC-T-XXX: SC-T-XXX is the form of designation of an SCDOT OMR Standard Method of Tests. The SCDOT OMR Standard Method of Tests are SCDOT specifications for sampling and testing methods and procedures. Consider the SCDOT OMR Standard Method of Tests included in the Specifications and a part of the contract whenever applicable. They are available at the following website: http://www.scdot.org/doing/rm_lab.asp

SC-M-XXX(MMY): SC-M-XXX(MMY) is the form of designation of a SCDOT Supplemental Technical Specification to these specifications. For example, SC-M-401(0507) is the SCDOT Supplemental Technical Specification Number 401 issued in May of 2007. Consider the Supplemental Technical Specifications included in the Specifications and a part of the contract whenever applicable. They prevail over the SCDOT Supplemental Specifications and SCDOT Standard Specifications when in conflict therewith. They are available at the following website: <http://www.scdot.org/doing/>

SHOP DRAWINGS of SHOP PLANS: All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, a Subcontractor, manufacturer, Supplier or distributor, which illustrate how specific portions of the Work shall be fabricated or installed.

SHOULDER: The Shoulder is that portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses

SIDEWALK: The Sidewalk is that portion of the roadway primarily constructed for the use of pedestrians.

SKEW OR SKEW ANGLE: The Skew or Skew Angle is the acute angle formed by the intersection of a line normal to the centerline of the roadway with a line parallel to the center- line of bents, piers, or abutments of a bridge, or in the case of a culvert, with the centerline of the culvert barrel(s).

SPECIAL CONDITIONS: A document containing terms and conditions which may be unique to the Project. Special Conditions are part of the Contract and shall not weaken the character or intent of the General Conditions and Supplemental Conditions. Special Conditions shall have precedence over the General Conditions and Supplemental Conditions.

SPECIAL PROVISIONS: The Special Provisions are the specifications in the contract revising or supplementing SCDOT Standard Specifications, the Supplemental Specifications, and Supplemental Technical Specifications for conditions peculiar to the individual project. The Special Provisions are included in this contract.

The Special Provisions prevail over the Supplemental Technical Specifications, the Supplemental Specifications, and the Standard Specifications and when in conflict therewith.

SPECIFIED COMPLETION DATE: The Specified Completion Date is the date specified in the contract on which the work is required to be completed.

STANDARD DRAWINGS (SCDOT): The SCDOT Standard Drawings for Roadway Construction also referred to as the 2009 SCDOT Standard Drawings are issued by the Department and are considered part of the contract documents. The Design Plans prevail over the SCDOT Standard Drawings when in conflict therewith.

STANDARD SPECIFICATIONS (SCDOT): These Standard Specifications is a reference to this document entitled the SCDOT Standard Specifications for Highway Construction, Edition 2007. Consider these Standard Specifications included in the general term the Specifications.

STREET: Street is a general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way. In general, this term is synonymous with "highway" and "road."

STRUCTURES: Bridges, culverts, catch basins, drop inlets, manholes, retaining walls, cribbing, endwalls, buildings, sewers, service pipes, underdrains, foundation drains, and other miscellaneous items which may be encountered in the work, and which are not otherwise classified herein.

SUBBASE: The layer or layers of specified or selected material of designated thickness or rate of application placed on a subgrade to comprise a component of the pavement structure to support the base course, pavement or subsequent layer of the construction.

SUBCONTRACTOR: An individual, firm or corporation having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work at the site. The term Subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor or his authorized representative.

SUBGRADE: The top surface of a roadbed upon which the pavement structure and shoulders are constructed.

SUBSTANTIAL COMPLETION: The point in the project when the work has been constructed to the typical sections in the plans over the entire length of the project, including tie-ins to adjacent projects or existing roads, all travel lanes are open to the public, all safety features are installed including traffic signals, traffic signs, and guardrail and are being properly maintained, and no lanes will have to be closed to complete any remaining work.

Except for a project where the major item of work is the installation of pavement markings or markers, the final pavement marking scheme must be in place with at least temporary markings, this would include temporary paint and RPMs, but the final pavement markings (thermoplastic and permanent RPMs) do not have to be in place, for the work to be substantially complete.

Substantial completion date shall be certified by the Town is sufficiently completed, in accordance with the Contract Documents. This date will be established by adding the Contractor's total number of days to the Notice to Proceed, minus 120 days.

SUBSTRUCTURE: The Substructure of a bridge is that part of the structure below the bridge seats or below the springlines of concrete arches. Backwalls and wingwalls of abutments are considered parts of the Substructure

SUPERINTENDENT: The Contractor's authorized representative in responsible charge of the work.

SUPERSTRUCTURE: The Superstructure is that part of the bridge above the substructure or above the springlines of concrete arches.

SUPPLEMENTAL CONDITIONS: Conditions of the Contract which may expand upon or modifies matters covered by the General Conditions. Supplemental Conditions have precedence over the General Conditions.

SUPPLEMENTAL SPECIFICATIONS: Supplemental Specifications are specifications adopted by the SCDOT after the publication of the 2007 Standard Specifications of Highway Construction and constitute a part thereof and of the Contract referenced. Supplemental Specifications prevail over the Standard Specifications when in conflict therewith.

SUPPLEMENTAL TECHNICAL SPECIFICATIONS: Specification of the Contract other than the Technical Specifications and makes reference to SC-M-XXX(MMY) SCDOT Supplemental Technical Specifications.

SUPPLIER: Any person or organization who supplies materials or equipment for the Work, including that fabricated to a special design, but who does not perform labor at the site.

SURETY: The corporation, partnership or individual bound with and for the Contractor for the full and complete performance of the contract, and for the payment of all debts pertaining to the work.

TECHNICAL SPECIFICATIONS (or SPECIFICATIONS): A part of the Contract Documents consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.

TOWN: Town of Summerville Government, acting through its duly authorized representative.

TEMPORARY STRUCTURE: A Temporary Structure is a structure required for the use of traffic while construction is in progress and is not to be retained as part of the permanent improvement.

TRAFFIC LANE: A Traffic Lane is that portion of a travelway for the movement of a single line of vehicles

TRAVELWAY or TRAVELED WAY: The Travelway or Traveled Way is that portion of the roadway for the movement of vehicles exclusive of the shoulders

UNIT PRICE: A Unit Price is the costs for a unit of measure of a contract item (pay item). It includes all materials, labor, equipment, tools, and supply costs plus all overhead, profit, and any other direct or indirect costs or expenses necessary to satisfactorily perform and complete the work

WORK: All labor necessary to produce the construction required by the Contract Documents, and all materials and equipment incorporated or to be incorporated in the Project.

WORKING DRAWING: Working Drawings include erection plans, falsework plans, cofferdam plans, temporary structure plans, or any other supplementary plans, or similar data that the contractor is required to submit to the TOWN or Consultant Designer representative for acceptance before assembly of erection of the subject of the drawings on the project site. Acceptance of the Working Drawings does not relieve the contractor of sole responsibility for the implementation methods or procedures contained in the Working Drawings.

WRITTEN NOTICE: Any notice to any part of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the Work.

1.8 ADDITIONAL DEFINITIONS: Wherever in the Specifications or on the Drawings, the words "as designated", "as detailed", "as directed", "as ordered", "as permitted", "as prescribed", "as provided", "as requested", "as required", or words of like import are used, it shall be understood that the designation, detail, direction, order, permission, prescribed, provision, request or requirement of the Town is intended.

Similarly, the words "approved", "acceptable", "satisfactory", and words of like import shall mean approved by, acceptable to, or satisfactory to the Town.

1.9 ABBREVIATIONS: Where any other following abbreviations are used in the Specifications, they shall have the meaning set forth opposite each.

AAN	American Association of Nurserymen
AAR	Association of American Railroads
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
AED	Associated Equipment Distributors
ADA	Americans with Disabilities Act
AGC	Associated General Contractors of America, Inc.
AHDGA	American Hot Dip Galvanizers Association

AIA	American Institute of Architects
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ALS	American Lumber Standards
AMRL	AASHTO Materials Reference Laboratory
ANLA	American Nursery & Landscape Association
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
ARA	American Railway Association
AREA	American Railway Engineering Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASLA	American Society of Landscape Architects
ASME	American Society of Mechanical Engineers
ASNS	American Standard for Nursery Stock
ASNT	American Society for Nondestructive Testing
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers' Association
AWPI	American Wood Preservers' Institute
AWS	American Welding Society
AWWA	American Water Works Association
BC	Berkeley Town
BCWS	Berkeley Town Water and Sanitation
CFR	Code of Federal Regulations
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standards, U. S. Department of Commerce
CSI	Construction Specification Institute
DBE	Disadvantaged Business Enterprise
ECTC	Erosion Control Technology Council
EPA	(U.S.) Environmental Protection Agency
FS	Federal Specification
FHWA	Federal Highway Administration
GSI	Geosynthetic Institute
IBC	International Building Code
ISE	International Safety Equipment Association
ISO	International Organization for Standardization
ITE	Institute of Traffic Engineers
MBMA	Metal Building Manufacturers Association
MUTCD	Manual of Uniform Traffic Control Devices
NCHRP	National Cooperative Highway Research Program
NCMA	National Concrete Masonry Association
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NFC	National Fire Code
NFPA	National Fire Protection Association
NIST	National Institute of Standards and Technology
NPDES	National Pollutant Discharge Elimination System (General Permit)
NRMCA	National Ready Mixed Concrete Association
NTPEP	National Transportation Product Evaluation Program

OCRM	Office of Coastal Resource Management
OSHA	Occupational Safety and Health Act
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PUPS	Palmetto Utility Protection Service
SAE	Society of Automotive Engineers
SCDA	South Carolina Department of Agriculture
SCDHEC	South Carolina Department of Health and Environmental Control
SCDNR	South Carolina Department of Natural Resources
SCDOI	South Carolina Department of Insurance
SCDOT	South Carolina Department of Transportation
SCPI	Structural Clay Products Institute
SDI	Steel Deck Institute
SPIB	Southern Pine Inspection Bureau
SSBC	Southern Standard Building Code
SSPC	Steel Structures Painting Council
TRB	Transportation Research Board
UL	Underwriters' Laboratories, Inc.
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USDOT	United State Department of Transportation
WWPA	Western Wood Products Association

1.10 PAY UNITS: The following lists common pay units.

PAY UNITS	
ACRE	Acre
BALE	Bale
CF	Cubic Foot
CY	Cubic Yard
CYHM	Cubic Yard Half-Mile
EA	Each
LB	Pound
LF	Linear Foot
LS	Lump Sum
MI	Mile
MSY	One-Thousand Square Yards
SF	Square Foot
STA	Station (100 feet)
SY	Square Yard
TON	Ton (2000 pounds avoirdupois)

2. TOWN'S RIGHTS AND RESPONSIBILITIES

2.1 CHANGES IN THE WORK: The Town, without invalidating the Contract, may make changes in the Work and in the Drawings and Specifications therefore by making alterations therein, additions thereto, or omissions therefrom. All work resulting from such changes shall be performed and furnished under and pursuant to the terms and conditions of the Contract. If such changes result in an increase or decrease in the work to be done hereunder, or increase or decrease the quantities thereof, adjustment in compensation shall be made therefore as provided in Subsection 7.12 entitled PAYMENT FOR EXTRA WORK.

This excludes the revised design of US 78, the right turn lane around Station 120+00.00 and the street lighting as the quantities for this work in included in the plans.

Except in an emergency endangering life or property, no change shall be made unless in pursuance of a written order from the Town authorizing the change, and no claim for additional compensation shall be valid unless the change is so ordered.

The Contractor agrees that he shall neither have nor assert any claim for, or be entitled to, any additional compensation for damages or for loss of anticipated profits on work that is eliminated.

2.2 PROJECT ENGINEER: The Project Engineer of record is the design professional named in the Contract Documents.

2.3 ENGINEER'S AUTHORITY: The Engineer is the design professional retained by the Town and, when designated as such in the Contract Documents, will be the Town's representative during the construction period and, when so designated, he will observe the work in progress on behalf of the Town. The Engineer will have the authority to act on behalf of the Town in the following matters consistent with Town's rights and obligations as set forth in these Contract Documents:

1. Interpretation of Contract Documents.
2. Approval of samples and shop drawings.
3. Preparation of supplementary details and instructions.
4. Inspection of construction work.
5. Preliminary approval of progress payment applications.

Any instructions which the Engineer may issue the Contractor shall be adjudged an interpretation of the Contract requirements and not an act of supervision. The Engineer has no authority, nor accepts any responsibility, either direct or implied, to direct and superintend the construction operations.

The Contractor shall proceed without delay to perform the work as directed, instructed, determined, or decided by the Engineer and shall comply promptly with such directions, instructions, determinations, or decisions. If the Contractor has any objection thereto, he may require that any such direction, instruction, determination, or decision be put in writing and within 10 days after receipt of any such writing, he may file a written protest with the Town stating clearly and in detail his objections, the reasons therefore, and the nature and amount of additional compensation, if any, to which he claims he will be entitled thereby. A copy of such protest shall be filed with the Engineer at the same time it is filed with the Town. Unless the Contractor files such written protest with the Town and Engineer within such 10 day period, he shall be deemed to have waived all grounds for protest of such direction, instruction, determination, or decision and all claims for additional compensation or damages occasioned thereby, and shall further be deemed to have accepted such direction, instructions, determination, or decision as being fair, reasonable, and finally determinative of his obligations and rights under the Contract.

2.4 LIABILITY OF TOWN: No person, firm or corporation, other than the Contractor, who signed this Contract as such, shall have any interest herein or right hereunder. No claim shall be made or be valid either against the Town or any agent of the Town and neither the Town nor any agent of the Town shall be liable for or be held to pay any money, except as herein provided. The acceptance by the Contractor of the payment as fixed in the final estimate shall operate as and shall be a full and complete release of the Town and of every agent of the Town of and from any and all claims, demands, damages and liabilities of, by or to the Contractor for anything done or furnished for or arising out of or relating to or by reason of the work or for or on account of any act or neglect of the Town or of any agent of the Town or of any other person, arising out of, relating to or by reason of the work, except the claim against the Town for the unpaid balance, if any there be, of the amounts retained as herein provided.

2.5 RIGHTS-OF-WAY AND SUSPENSION OF WORK: The Town 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 Town 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 Town 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 inability to procure any lands or rights-of-way for the 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 Town; but time for completion of the work will be extended to such time as the Town determines will compensate for the time lost by such delay, such determination to be set forth in writing.

2.6 PERMITS AND REGULATIONS: The Town will provide the US Army Corps of Engineers, MS4, NOI, and SCDOT encroachment permits, as may be applicable. The Contractor shall secure and pay for all remaining permits as needed to execute the Work properly. This includes but not limited to the following.

The Contractor is required to submit the Norfolk Southern Contractor Right of Entry Agreement execution and approval to the Railroad.

The Contractor shall obtain the tree removal permit from the Town of Summerville. The permit application has been submitted to the Town and the Town will approve once the Contractor informs the Town on who will be performing the tree cutting services.

The Contractor shall give all notices and comply with all permits, laws, ordinances, rules and regulations bearing on the conduct of the Work as drawn and specified. If the Contractor observes that the Contract Documents are at variance therewith, he shall promptly notify the Town in writing, and any necessary changes shall be adjusted as provided in Subsection 2.1 entitled CHANGES IN THE WORK.

2.7 DIMENSIONS, ELEVATIONS, and REFERENCE DATA: The base lines for locating the principal components of the Work and bench marks establishing the elevations of the Work are shown on the Drawings. The Contractor shall be responsible for performing all survey work required for the construction, including the establishment of baselines and any detail surveys needed for construction. This work shall include the staking out of the permanent and temporary easements to ensure that the Contractor is not deviating from the designated easements and or right-of-ways

Before proceeding with any work dependent upon the data provided, the Contractor shall field check and verify all dimensions, grades, inverts, lines, elevations or other conditions or limitations at the site of the Work to avoid construction errors or damage to existing facilities. If any work is preformed by the Contractor, or any subcontractors, prior to adequate verifications of applicable data, any resultant extra cost for adjustment of

work necessary to conform to existing conditions, or damage to existing facilities, shall be assumed by the Contractor without reimbursement or compensation by the Town.

2.8 TOWN'S RIGHT OF AUDIT: In case the Town agrees that a Contractor perform work on a cost plus basis, the Town is to have a full and complete right to audit and make copies of Contractor's or Subcontractor's records with respect to any payment the Town may be requested to make, or may make, for any work done on a cost plus basis.

2.9 TOWN'S RIGHT TO SEPARATE CONTRACTS: The Town reserves the right to let other contracts in connection with the Work under similar General Conditions. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs.

The Town may perform additional Work related to the Project by himself, or he may let other contracts containing provisions similar to these. The Contractor will afford the other contractors who are parties to such Contracts (or the Town, if he is performing the additional Work himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of Work and shall properly connect and coordinate his Work with theirs.

2.10 TOWN'S RIGHT TO DO WORK: If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this contract, the Town, after three (3) days' written notice to the Contractor may, without prejudice to any other remedy he may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor. If such expense shall exceed the unpaid balance, the Contractor shall pay the difference to the Town on demand.

The Town's certificate setting forth the fair and reasonable cost of repairing, replacing, rebuilding or restoring any damaged or defective work or equipment when performed by one other than the Contractor shall be binding and conclusive as to the amount thereof upon the Contractor.

2.11 TOWN'S RIGHT TO TERMINATE CONTRACT: If the Contractor should be adjudged a bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver or trustee should be appointed on account of his insolvency, or if he should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, or if he should fail to make prompt payment to Subcontractors or for material or labor, or persistently disregard laws, ordinances or the instructions of the Town and his representatives, or otherwise be guilty of substantial violation of any provision of the Contract, then the Town, may, without prejudice to any other right or remedy and after giving the Contractor, and his surety, if any, seven days' written notice, terminate the employment of the Contractor and take possession of the premises and of all materials, as it may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the contract price shall exceed the expense of finishing the work including compensation for additional engineering, managerial and administrative services, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the Contractor shall pay the difference to the Town.

2.12 SUSPENSION OF WORK, TERMINATION AND DELAY: The Town may suspend the Work or any portion thereof for a period of not more than ninety (90) days or such further time as agreed upon by the Contractor, by written notice to the Contractor, which notice shall fix the date on which Work shall be resumed. The Contractor will resume that Work on the date so fixed. The Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension.

2.13 INSPECTIONS AND TESTING: If the Contract Documents, Town 's instructions, laws, ordinances or any public authority having jurisdiction require any work to be specially tested or approved, the Contractor shall give the Town timely notice of its readiness for observation by the Town or inspection by another authority, and if the inspection is by another authority rather than the Town, of the date fixed for such inspection. The required certificates of such inspection shall be secured by the Contractor. Observations by the Town shall be promptly made, and where practicable, at the source of supply. If any work should be covered up without approval or consent of the Town, it must, if required by the Town, be uncovered for examination, at the Contractor's expense.

2.14 INSPECTION OF WORK AWAY FROM THE SITE: If the work to be done away from the construction site is to be inspected on behalf of the Town during its fabrication, manufacture, or testing, or before shipment, the Contractor shall give notice to the Town of the place and time where such fabrication, manufacture, testing, or shipping is to be done. Such notice shall be in writing and delivered to the Town in ample time so that the necessary arrangements for the inspection can be made.

2.15 PIPE LOCATION: Exterior pipelines will be located substantially as indicated on the Drawings, but the right is reserved to the Town, to make such modifications in location as may be found desirable to avoid interference with structures or for other reasons. Where fittings, etc., are noted on the Drawings such notation is for the Contractor's convenience and does not relieve him from laying and jointing different or additional items where required.

2.16 PRIOR USE OR OCCUPANCY: The Town reserves the right to use or occupy the Work or portion thereof, and to use equipment installed under the Contract, prior to final acceptance. Such use or occupancy will not constitute acceptance of the Work or any part thereof. Despite such use or occupancy, guarantee periods will not begin until the final acceptance of all work under the Contract, unless agreement to the contrary is made in writing between the parties.

2.17 WEATHER CONDITIONS: In the event of temporary suspension of work, or during inclement weather, or whenever the Town 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 Town, 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 so to protect its work, such materials shall be removed and replaced as the expense of the Contractor.

2.18 TOWN'S RIGHT TO CLEAN UP: If a dispute arises between the separate contractors as to their responsibility for cleaning up, the Town may clean up and charge the cost thereof to the Contractor as the Town shall determine to be just.

3. CONTRACTOR'S RIGHTS AND RESPONSIBILITIES

3.1 ACCESS TO WORK: The Town, the Engineer, and their officers, agents, servants, and employees plus representatives of the various participating Federal, State or local agencies may at any and all times and for any and all purposes, enter upon the work and site thereof and the premises used by the Contractor, and the Contractor shall at all times provide safe and proper facilities therefore.

3.2 ACCIDENT PREVENTION: In the performance of the contract the Contractor shall comply with the applicable provisions of the regulations issued by the Secretary of Labor pursuant to section 107 of the Contract Work Hours and Safety Standards Act entitled "Safety and Health Regulations for Construction" (29 CFR 1518, renumbered as Part 1926). Occupational Safety and Health Standards (29 CFR Part 1910) issued by the Secretary of Labor pursuant to the Williams-Steiger Occupational Safety and Health Act of 1970 are applicable to work performed by the Contractor subject to the provisions of the Act.

3.3 STATED ALLOWANCES: The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. These allowances shall cover the net cost of the materials and equipment delivered and unloaded at the site, and all applicable taxes. The Contractor's handling costs on the site, labor, installation costs, overhead, profit and other expenses contemplated for the original allowance shall be included in the Contract Sum and not in the allowance. If the cost, when determined, is more than or less than the allowance, the Contract Sum shall be adjusted accordingly by Change Order which will include additional handling costs on the site, labor, installation costs, overhead, profit and other expenses resulting to the Contractor from any increase over the original allowance.

3.4 ARCHAEOLOGICAL RIGHTS: There is a possibility that items of archaeological significance may be found during the excavation of the site. In such event, the Contractor shall stop excavation in the vicinity of the find and notify the Town immediately; subsequent excavation work shall proceed as directed by the Town. All items found which are considered to have archaeological significance are the property of the Town.

3.5 AS-BUILT DRAWINGS: The Contractor shall designate one set of Drawings for "As-Built Drawings". The Contractor shall indicate on these drawings all field changes affecting various mechanical, electrical, piping and other items as well as locations as actually installed. The "As-Built Drawings" shall be kept current by the Contractor. The "As-Built Drawings" shall be delivered to the Town upon completion and acceptance of the work. Final payment for the work will not be made until the "As-Built Drawings" have been completed and delivered as indicated above.

3.6 OBLIGATIONS OF CONTRACTOR: The Contractor shall and will, in good workmanlike manner, do and perform all work and furnish all supplies and materials, tools, machinery, equipment, transportation, supervision, temporary construction of any nature, and all other services, means and facilities except as herein otherwise expressly specified, necessary or proper to perform and complete all work required by this Contract, within the time herein specified, in accordance with the provisions of this Contract and in accordance with the Drawings and Specifications and in accordance with the direction of the Town 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 limitations of the Contract and Specifications, and shall do, carry on, and complete the entire work to the satisfaction of the Town.

The Contractor shall check all dimensions, elevations, quantities and instructions shown on the Drawings or given in the Specifications and shall notify the Town should any discrepancy of any kind be found in the Drawings, Specifications or conditions at the site. He will not be allowed to take advantage of any discrepancy, error or omission in the Contract Documents. If any discrepancy is discovered, the Town will issue full instructions pertaining thereto and the Contractor shall carry out these instructions as if originally specified.

3.7 CLAIMS FOR ADDITIONAL COST: If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give written notice thereof within twenty days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering life or property, in which case the Contractor shall proceed in accordance with Subsection 3.28 entitled PROTECTION OF WORK, PROPERTY AND PERSONS IN AN EMERGENCY. No such claim shall be valid unless so made. If the Town and the Contractor cannot agree on the amount of the adjustment in the Contract Sum, it shall be determined by the Engineer. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

3.8 CLAIMS FOR DAMAGE: If the Contractor makes claim for any damages alleged to have been sustained by breach of contract or otherwise, he shall, within ten (10) days after occurrence of the alleged breach or within ten (10) days after such damages are alleged to have been sustained, whichever date is the earlier, file with the Town a written, itemized statement in triplicate of the details of the alleged breach and the details and amount of the alleged damages. The Contractor agrees that unless such statement is made and filed as so required, his claim for damages shall be deemed waived, invalid and unenforceable, and that he shall not be entitled to any compensation for any such alleged damages. Within ten (10) days after the timely filing of such statement, the Town will provide a response to the Contractor.

The Contractor shall not be entitled to claim any additional compensation for damages by reason of any direction, instruction, determination or decision of the Engineer, nor shall any such claims be considered, unless the Contractor shall have complied in all respects with the last paragraph of Subsection 2.3 entitled ENGINEER'S AUTHORITY, including, but not limited to, the filing of written protest in the manner and within the time therein provided.

3.9 RAILROAD: The contractor shall refer to Norfolk Southern-Special Provisions for Protection of Railway Interest for Railroad Requirements.

3.10 CLEANING UP: The Contractor at all times shall keep the site of the work free from rubbish and debris caused by his operation under the Contract. When the work has been completed, the Contractor shall remove from the site of the work all of his plant, machinery, tools, construction equipment, temporary work and surplus materials so as to leave the work and the site clean and ready for use.

All public streets adjacent to the site and all private ways at the site shall be kept clean of debris, spilled materials, and wet and dry earth at all times and shall be cleaned at the end of each working day. When wet earth is encountered, it shall be cleaned from the vehicles before they leave the site and enter streets and private ways.

3.11 NON-COMPLIANCE WITH CONTRACT REQUIREMENTS: In the event the Contractor, after receiving written notice from the Town of non-compliance with any requirement of this Contract, fails to initiate promptly such action as may be appropriate to comply with the specified requirement within a reasonable period of time, the Town shall have the right to order the Contractor to stop any or all work under the Contract until the Contractor has complied or has initiated such action as may be appropriate to comply within a reasonable period of time. The Contractor will not be entitled to any extension of contract time or payment for any costs incurred as a result of being ordered to stop work for such cause.

3.12 OVERALL PROJECT COORDINATION: The Contractor shall coordinate all Work of his Contract to produce the required finished Project in accordance with the Contract Documents. Special attention shall be given to the submission of shop drawings, samples, color charts, and requests for substitution within the specified time; furnishing the proper shop drawings to Subcontractors and material suppliers, whose work and equipment is affected by and related thereto; and the furnishing of all information concerning location, type, and size of built-in equipment and materials and equipment utilities. This coordination is in addition to all other coordination requirements called for in the technical sections of the Specifications.

3.13 COMMUNICATIONS: The Contractor shall forward all communications to the Town through the Town's authorized representative designated in the Contract Documents.

3.14 NO DISCRIMINATION IN EMPLOYMENT: In connection with the performance of work under this Contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of race, religion, color, or national origin. The aforesaid provision shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

3.15 DRAWINGS AND SPECIFICATIONS AT THE SITE: The Contractor shall maintain at the site one complete set of all Drawings, Specifications, Addenda, approved Shop Drawings, Change Orders and other Modifications, in good and readable condition and marked to record all changes made during construction. These shall be available to the Town and the Engineer. The Drawings, marked to record all changes made during construction, shall be delivered to the Town upon completion of the work.

3.16 EMPLOY COMPETENT PERSONS: The Contractor shall endeavor to employ only competent persons on the Work. Whenever the Town notifies the Contractor in writing that in his opinion any person on the Work is incompetent, unfaithful, disorderly, or otherwise unsatisfactory, or not employed in accordance with the provisions of the Contract, such person shall be discharged from the Work and shall not again be employed on it, except with the written consent of the Town. Provided, however, that the failure of the Town to object to an employee is not to be considered acknowledgment or approval of the employee's competence by the Town.

3.17 EMPLOY SUFFICIENT LABOR AND EQUIPMENT: If, in the judgment of the Town, the Contractor is not employing sufficient labor, plant, equipment or other means to complete the work within the time specified, the Town may, after giving written notice, require the Contractor to employ such additional labor, plant, equipment and other means as the Town may deem necessary to enable the work to progress properly.

3.18 EXISTING STRUCTURES: Where the dimensions and locations of existing structures are of importance in the installation or connection of any part of the Work, the Contractor shall verify such dimensions and locations in the field before the fabrication of any material or equipment which is dependent on the correctness of such information.

3.19 INDEMNIFICATION: The Contractor will indemnify and hold harmless the Town and the Engineer and their agents and employees from and against all claims, damages, losses and expenses, including attorneys' fees, arising out of or resulting from the performance of the Work, provided that any such claim, 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 therefrom; and is caused in whole or in part by any negligent or willful act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable.

In any and all claims against the Town or the Engineer, or any of their agents or employees, by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any 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.

3.20 INTOXICATING LIQUORS: The Contractor shall not sell and shall neither permit nor suffer the introduction or use of intoxicating liquors upon or about the work.

3.21 LEGAL ADDRESS OF CONTRACTOR: The Contractor's business address and his office at or near the site of the work are both hereby designated as places to which communications may be delivered. The depositing of any letter, notice, or other communication in a postpaid wrapper directed to the Contractor's business address in a post office box regularly maintained by the U. S. Postal Service or the delivery at either designated address of any letter, notice, or other communication by mail or otherwise shall be deemed sufficient service thereof upon the Contractor, and the date of such service shall be the date of receipt. The designated address may be changed at any time by an instrument in writing, executed and acknowledged by the Contractor and delivered to the Town. Service of any notice, letter or other communication upon the Contractor personally shall likewise be deemed sufficient service.

3.22 MUTUAL RESPONSIBILITY OF CONTRACTORS: The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work, and shall properly connect and coordinate his Work with theirs.

If any part of the Contractor's Work depends for proper execution or results upon the work of any other separate contractor, the Contractor shall inspect and promptly report to the Town any apparent discrepancies or defects in such work that render it unsuitable for such proper execution and results. Failure of the Contractor to so inspect and report shall constitute an acceptance of the other contractor's work as fit and proper to receive his Work, except as to defects which may develop in the other separate contractor's work after the execution of the Contractor's Work. To ensure proper execution of the subsequent work, the Contractor shall measure work already in place and shall at once report to the Town any discrepancy between the executed work and the Contract Documents.

Should the Contractor cause damage to any separate contractor on the work, the Contractor agrees, upon due notice, to settle with such contractor by agreement or arbitration, if he will so settle. If such separate contractor sues the Town on account of any damage alleged to have been so sustained, the Town shall notify the Contractor, who shall defend such proceedings at the Contractor's expense, and if any judgment against the Town arises therefrom, the Contractor shall pay or satisfy it and pay all costs incurred by the Town.

3.23 NIGHT AND SUNDAY WORK: Work will not be allowed at night, on Sundays, or Legal Holidays.

Work outside of normal Monday-Friday business hours on Railroad Property shall be approved by the Railroad and Town's Engineer.

3.24 OCCUPYING PRIVATE LAND: The Contractor shall not (except after written consent from the proper parties) enter or occupy with men, tools, materials, or equipment, any land outside the rights-of-way or property of the Town. A copy of the written consent shall be given to the Town prior to occupation of private land. This also applies to the railroad property.

3.25 PERMITS AND RESPONSIBILITIES: The Contractor shall, without additional expense to the Town, be responsible for obtaining any necessary licenses and permits, except those obtained by the Town, and for complying with any applicable permits and any applicable Federal, State and municipal laws, codes, and regulations, in connection with the prosecution of the work. He shall be similarly responsible for all damages to persons or property that occur as a result of his fault or negligence. He shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire construction work, except for any completed unit of construction thereof which theretofore may have been accepted.

The Contractor shall file a Notice of Termination (NOT) with the South Carolina Department of Health and Environmental Control upon project acceptance.

3.26 PRECAUTIONS DURING ADVERSE WEATHER: During adverse weather and against the possibility thereof, the Contractor shall take all necessary precautions so that the Work may be properly done and satisfactory in all respects. When required, protection shall be provided by use of tarpaulins, berms, wood and building-paper shelters, or other approved means.

During cold weather, materials shall be preheated, if required, and the materials and adjacent structure into which they are to be incorporated shall be made and kept sufficiently warm so that a proper bond will take place and a proper curing, aging, or drying will result. Protected spaces shall be artificially heated by approved means which will result in a moist or a dry atmosphere according to the particular requirements of the work being protected. Ingredients for concrete and mortar shall be sufficiently heated so that the mixture will warm throughout when used.

3.27 PROTECTION OF WORK, PROPERTY AND PERSONS: The Contractor will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. He will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the Work and other persons who may be affected thereby, all the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

The Contractor will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He will erect and maintain as required by the conditions and progress of the Work, all necessary safeguards for safety and protection. He will notify the Town of adjacent utilities when prosecution of the Work may affect them. The Contractor will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any subcontractor, or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable, except damage or loss attributable to the fault of the Contract Documents or to the acts or omissions of the Town or the Engineer or anyone employed by either of them or anyone for whose acts either of them may be liable and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the Contractor.

3.28 PROTECTION OF WORK, PROPERTY AND PERSONS IN AN EMERGENCY: In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer or Town, shall act to prevent threatened damage, injury or loss. He will give the Town prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby, and a Change Order shall thereupon be issued covering the changes and deviations involved.

3.29 PROTECTION AGAINST WATER AND STORM: The Contractor shall take all precautions necessary to prevent damage to the Work by storms or by water entering the site of the Work directly or through the ground. In case of damage by storm or water, the Contractor shall at his own cost and expense make such repairs or replacements or rebuild such parts of the Work as the Town may require in order that the finished work may be completed as required by the Contractor.

3.30 PROTECTION OF EXISTING VEGETATION, STRUCTURES, and UTILITIES AND IMPROVEMENTS: The Contractor will preserve and protect all existing vegetation such as trees, shrubs, and grass on or adjacent to the site of the work which is not to be removed and which does not reasonably interfere with the construction work. Care shall be taken in removing trees authorized for removal to avoid damage to vegetation to remain in place. Any limbs or branches of trees broken during such operations or by the careless operation of equipment or by workmen, shall be trimmed with a clean cut and painted with an approved tree pruning compound as approved by the Town.

The Contractor will protect from damage all existing improvements or utilities at or near the site of the work, the location of which is made known to him, and will repair or restore any damage to such facilities resulting from failure to comply with the requirements of this Contract or the failure to exercise reasonable care in the performance of the Work. If the Contractor fails or refuses to repair any such damage promptly, the Town may have the necessary work performed and charge the cost thereof to the Contractor.

The Contractor shall enclose the trunks of trees adjacent to his work and not to be cut, with substantial barriers of such size as may be necessary to protect the trees from injury from piled material, from equipment, from his operation, or otherwise due to his work. Excavating machinery and cranes shall be of suitable type and shall be operated with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.

On paved surfaces, the Contractor shall not use or operate tractors, bulldozers or other power-operated equipment, the treads or wheels of which are so shaped as to cut or otherwise injure such surfaces.

The Contractor shall refer to the Norfolk Southern-Special Provisions for Protection of Railway Interests for Railroad Requirements when work on or near the railroad property.

3.31 RESTORATION OF PROPERTY: All existing surfaces, including lawns, grassed and planted areas which have been injured by the Contractor's operations, shall be restored to a condition at least equal to that in which they were found immediately before work was begun. Suitable materials and methods shall be used for such restoration. All restored plantings shall be maintained by cutting, trimming, fertilizing, etc., until acceptance. The restoration of existing property or structures shall be done as promptly as practicable and shall not be left until the end of construction period.

The Contractor shall refer to the Norfolk Southern-Special Provisions for Protection of Railway Interests for Railroad Requirements when work on or near the railroad property.

3.32 INTERFERENCE WITH AND PROTECTION OF STREETS: The Contractor shall not close or obstruct any portion of a street, road, or private way without obtaining permits therefore from the proper authorities. If any street, road or private way shall be rendered unsafe by the Contractor's operations, he shall make such repairs or provide such temporary ways or guards as shall be acceptable to the proper authorities.

Streets, roads, private ways, and walks not closed shall be maintained passable and safe by the Contractor, who shall assume and have full responsibility for the adequacy and safety of provisions made therefore.

The Contractor shall, at least 48 hours in advance, notify the SCDOT, Town and Municipal agencies, EMS, law enforcement and fire departments in writing, with a copy to the Town, if the closure of a street or road is necessary. He shall cooperate with the law enforcement agencies in the establishment of alternate routes and shall provide adequate detour signs, plainly marked and well lighted, in order to minimize confusion.

The Contractor shall refer to the Norfolk Southern-Special Provisions for Protection of Railway Interests for Railroad Requirements when work on or near the railroad property.

3.33 TRAFFIC CONTROL: The Contractor shall provide a Traffic Control Plan for the maintenance and control of traffic during work within the highway or road right of way. The Traffic Control Plan shall set forth procedures and guidelines for providing for the safe passage of traffic through and around the project area with a minimum of inconvenience. The Traffic Control Plan shall conform to the requirements of the SCDOT Standard Specifications for Highway Construction, the SCDOT Standard Drawings for Road Construction, Encroachment Permits, and the Contract Documents.

The Contractor shall coordinate traffic control for Railroad Forces to construct the highway/railroad at-grade crossing surface and install railroad signal/appurtenances.

3.34 CONSTRUCTION DRAINAGE: The Contractor shall furnish all labor, materials and necessary equipment for the temporary control of surface water and seepage water during construction.

The Contractor shall furnish and operate pumps and other equipment required. Dikes and ditches shall be constructed around excavations and elsewhere as necessary to prevent surface water from flooding the excavations or standing in areas adjacent to excavations, in work areas or in material storage areas. The Contractor shall take all necessary precautions to protect adjacent areas and properties at points other than that which would be considered the natural flow, prior to construction, without the expressed consent of the

Town in writing. He shall take steps to prevent the erosion of soil, earth and other material and the conduction of the eroded materials onto adjacent properties and shall be responsible for the removal of such materials and the restoration of adjacent areas to their original condition.

The Contractor shall refer to the Norfolk Southern-Special Provisions for Protection of Railway Interests for Railroad Requirements when work on or near the railroad property.

3.35 RETURN OF DRAWINGS: All copies of Drawings, Specifications and other Documents furnished by the Town or the Engineer to the Contractor may be used only in connection with the prosecution of the Work and shall be returned by the Contractor upon completion of the Work.

3.36 SITE INVESTIGATION: The Contractor acknowledges that he has investigated and satisfied himself as to the conditions affecting the Work, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, river stages, water table, tides or similar physical conditions at the site, the confirmation and conditions of the ground, the character of equipment and facilities needed preliminary to and during prosecution of the Work. The Contractor further acknowledges that he has satisfied himself as to character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Town, as well as from information presented by the Drawings and Specifications made a part of this Contract. Any failure by the Contractor to acquaint himself with the available information will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work. The Town assumes no responsibility for any conclusions or interpretations made by the Contractor on the basis of the information made available by the Town.

3.37 SOIL EROSION AND SEDIMENT CONTROL: The Contractor shall be responsible for conducting his site grading and drainage operations in such manner as to prevent excessive soil erosion of the construction site work areas. He shall at all times provide satisfactory means to prevent the movement and washing of soil onto pavements or into adjacent ditches, swales, inlets, and drainage pipes, to avoid the possibility of these structures becoming clogged with sediment. He shall promptly repair all areas which may become eroded and shall clear drainage ditches, swales, and structures of siltation. The Contractor will indemnify and save harmless the Town and Engineer from and against any and all claims, demands, fines, or assessments, including attorneys' fees and cost of defense arising out of or caused by the Contractor's failure to provide soil erosion and sediment control.

3.38 SUBSURFACE CONDITIONS: The Contractor shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the Town by Written Notice of:

1. Subsurface or latent physical conditions of the site differing materially from those indicated in the Contract Documents.
2. Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents.

The Town shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the Work, an equitable adjustment shall be made and the Contract Documents shall be modified by Change Order. Any claim of the Contractor for adjustment hereunder shall not be allowed unless he has given the required Written Notice; provided that the Town may, if he determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

3.39 SUBCONTRACTING: The Contractor may utilize the services of specialty Subcontractors on those parts of the Work which, under normal contracting practices, are performed by specialty Subcontractors. The Contractor shall, without additional expense to the Town, utilize the services of specialty subcontractors on those parts of the work which are specified to be performed by specialty subcontractors.

The Contractor shall not award Work to Subcontractor(s), in excess of fifty (50%) percent of the Contract Price, without prior written approval of the Town.

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

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 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 Town may exercise over the Contractor under any provisions of the Contract Documents.

If any other contractor or any subcontractor of any such other contractor shall suffer or claim to have suffered loss, damage or delay by reason of the acts or omissions of the Contractor or of any of his Subcontractors, the Contractor agrees to assume the defense against any such claim and to reimburse such other contractor or subcontractor for such loss or damage. The Contractor agrees to and does hereby indemnify and save harmless the Town from and against any and all claims by such other contractors or subcontractors alleging such loss, damage or delay and from and against any and all claims, demands, costs and expenses, including attorneys' fees, arising out of, relating to or resulting from such claims.

The Contractor shall be responsible for the coordination of the trades, subcontractors, and material men engaged upon his work. The Town will not undertake to settle any differences between the Contractor and his Subcontractors or between Subcontractors. If any Subcontractor on the project, in the opinion of the Town, proves to be incompetent or otherwise unsatisfactory, he shall be replaced if and when directed in writing.

3.40 SUPERVISION: The Contractor shall keep on his work, during its progress, a competent superintendent and any necessary assistants, all satisfactory to the Town. The superintendent shall not be changed except with the consent of the Town, unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in his employ. The superintendent shall represent the Contractor in his absence and all directions given to him shall be as binding as if given to the Contractor. Important directions shall be confirmed in writing to the Contractor. Other directions shall be so confirmed on written request in each case. The Town shall not be responsible for the acts or omissions of the superintendent or his assistants.

The Contractor shall give efficient supervision to the Work, using his best skill and attention. He shall carefully study and compare all Drawings, Specifications and other instructions and shall at once report to the Town any error, inconsistency or omission which he may discover.

3.41 TAXES: The Contractor shall promptly pay federal, state and local taxes which may be assessed against him in connection with the work or his operations under the Agreement and/or the other Contract Documents, including, but not limited to, taxes attributable to the purchase of materials and equipment, to the performance of services, and the employment of persons in the prosecution of the work.

3.42 TEMPORARY HEAT: The Contractor shall provide temporary heat whenever necessary to protect all Work and materials against injury from dampness and cold and to dry out moisture from the building. Fuel, equipment and method of heating shall be satisfactory to the Town and its insurer.

Temporary heating apparatus shall be installed and operated in such a manner that finished work will not be damaged thereby.

3.43 SANITARY FACILITIES: The Contractor shall provide adequate sanitary facilities for the use of those employed on the Work. Such facilities shall be made available when the first employees arrive on the site of the Work, shall be properly secluded from public observations, and shall be constructed and maintained during the progress of the Work in suitable numbers and at such points and in such manner as may be required or approved. The Contractor shall maintain the sanitary facilities in a satisfactory and sanitary condition at all times and shall enforce their use. He shall rigorously prohibit the committing of nuisances on the site of the work, on the lands of the Town, or on adjacent property. The Town shall have the right to inspect such facilities at all times to determine whether or not they are being properly and adequately maintained.

3.44 TEMPORARY UTILITIES: The Contractor shall make arrangements for and furnish as a part of the Contract, all electricity, water, lighting and other utilities needed to do the Work called for by the Contract. Any separate contractors having a contract with the Town shall make arrangements for and share the cost with the Contractor for the use of the required utilities on a pro rated schedule based on an agreed basis. All electrical work shall comply with the National Electrical Code.

The Contractor shall provide and pay for all temporary wiring, switches, connections and meters. The Contractor shall provide sufficient electric lighting so that all work may be done in a workmanlike manner when there is not sufficient daylight.

3.45 UNCOVERING AND CORRECTION OF WORK: The Town and the Engineer shall be furnished by the Contractor with every reasonable facility for examining and inspecting the work and for ascertaining that the work is being performed in accordance with the requirements and intent of the Contract, even to the extent of requiring the uncovering or taking down of portions of finished work by the Contractor.

Should the work thus uncovered or taken down prove satisfactory, the cost of uncovering or taking down and the replacement thereof shall be considered as extra work unless the original work was done in violation of the Contract in point of time or in the absence of the Town or its inspector and without his written authorization, in which case said cost shall be borne by the Contractor. Should the work uncovered or taken down prove unsatisfactory, said cost shall likewise be borne by the Contractor.

The inspection of the work shall not relieve the Contractor of any of his obligations to perform and complete the work as required by the Contract. Defective work shall be corrected and unsuitable materials, equipment, apparatus and other items shall be replaced by the Contractor, notwithstanding that such work, materials, equipment, apparatus and other items may have been previously overlooked or accepted or estimated for payment. If the work or any part thereof shall be found defective at any time before the final acceptance of the work, the Contractor shall forthwith make good such defect in a manner satisfactory to the Town; if any materials, equipment, apparatus or other items brought upon the site for use or incorporation in the work, or selected from the same, are condemned by the Town as unsuitable or not in conformity with the Specifications or any of the other Contract Documents, the Contractor shall forthwith remove such materials, equipment, apparatus and other items from the site of the work and shall at his own cost and expense make good and replace the same and any material furnished by the Town which shall be damaged or rendered defective by the handling or improper installation by the Contractor, his agents, servants, employees or subcontractors.

If the Town deems it inexpedient to correct work injured or done not in accordance with the Contract, an equitable deduction from the Contract Price shall be made therefore.

3.46 COOPERATION WITH UTILITIES: The Town will notify all utility companies or other parties affected and will begin all utility coordination to endeavor to have all necessary utility adjustments of the public or private utility fixtures, pipelines, and other appurtenances within or adjacent to the limits of construction, relocated as soon as practicable. It will be the contractor's responsibility to assume utility coordination once notice-to-proceed is issued. A regular scheduled utility coordination meeting is suggested to be coordinated and held by the contractor.

Water lines, gas lines, wire lines, sewer lines, water and gas meter boxes, water and gas valve boxes, manholes, light standards, cableways, signals, and all other utility appurtenances within the limits of the proposed construction which are to be relocated or adjusted are to be moved by the utility companies under separate agreement, except as otherwise provided for in the Special Provisions or as noted on the Drawings.

The Drawings will show all known utilities located within the limits of the contract according to information obtained. The accuracy of the Drawings in this respect is not guaranteed by the Town. The Contractor shall have considered in his bid all of the permanent and temporary utility appurtenances in their present or relocated position. No additional compensation will be allowed for any delays, inconveniences, or damages sustained by him due to any interference from the said utility appurtenances or the operation of moving them.

Utility relocation plans are included in the contract construction drawings for this project. These plans are for illustration purposes only so the contractor can visualize the utility relocations. For detailed construction utility relocation plans, the contractor will need to coordinate with the utility owners to obtain copies. It is the responsibility of the Contractor to call SC811 and the non SC811 member utilities three (3) days prior to work so that the existing utilities can be properly marked. All utility relocation work for those who are inside the project limits will be verified and coordinated by the contractor during construction.

Unless otherwise provided, the cost of temporary rearrangement of utilities made only in order to facilitate the construction of the work will be borne by the Contractor.

The Contractor shall refer to the Norfolk Southern-Special Provisions for Protection of Railway Interests for Railroad Requirements when work on or near the railroad property.

3.47 VERIFICATION OF DIMENSIONS AND ELEVATIONS: Dimensions and elevations indicated on the Drawings in reference to existing structures, location of utilities, sewer inverts, or other information on existing facilities, are the best available data obtainable but are not guaranteed by the Town or the Engineer. The Town will not be responsible for their accuracy. Before proceeding with any work dependent upon the data involved, the Contractor shall field check and verify all dimensions, grades, inverts, lines, elevations, or other conditions of limitations at the site of the work to avoid construction errors or damage to existing facilities. If any work is performed by the Contractor, or any subcontractors, prior to adequate verification of applicable data, any resultant extra cost for adjustment of work necessary to conform to existing facilities, shall be assumed by the Contractor without reimbursement or compensation by the Town.

If the Contractor, in the course of the work, finds any discrepancy between the Drawings and the physical conditions of the locality, or any errors or omissions in the Drawings or in the layout as given by survey points and instructions, he shall immediately inform the Town, in writing. The Town will promptly investigate the reported conditions and issue such instructions as may be necessary for the proper execution of the work. Any work done after such discovery and prior to receipt of such instructions shall be at the risk of the Contractor.

4. MATERIALS, EQUIPMENT AND WORKMANSHIP

4.1 CHEMICAL USAGE: All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall show approval of either EPA or U.S.D.A. The use of all such chemicals and disposal of residues shall be in strict conformance with manufacturer and U.S.D.A. instructions.

4.2 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.

4.3 CORRECTION OF WORK BEFORE COMPLETION: The Contractor shall promptly remove from the premises all work condemned by the Town as failing to conform to the Contract Documents, whether incorporated or not and the Contractor shall promptly replace and re-execute his own work in accordance with the Contract and without expense to the Town and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement. The fact that such defective work may have previously been overlooked shall not constitute an acceptance of any part of it.

If the Contractor does not remove such condemned work within a reasonable time, fixed by written notice, the Town may remove it, and after storing it at the job site for 30 days, due written notice thereof being given the Contractor, the Town may offer the material for sale and removal from the premises. Net proceeds from such sale shall be for the Contractor's credit against the "Town's Right to Do Work". If the material has no sale value, the Town may remove it from the premises and/or otherwise dispose of it. The costs of such disposition shall be deducted from payments to the Contractor as provided in Subsection 2.10 entitled TOWN'S RIGHT TO DO WORK.

4.4 CORRECTION OF WORK AFTER COMPLETION: The Contractor shall remedy any defects due to faulty materials or workmanship and pay for any damage to other work resulting therefrom which shall appear within a period of one year from the date of final acceptance of the work except where longer periods are specified and in accordance with the terms of any special guarantees provided in the Contract.

4.5 CORRECTIONS OF WORK AFTER GUARANTEE PERIOD: It shall be the responsibility of the Contractor to permanently correct all defective items called to his attention within the guarantee period, whether such correction be made within the guarantee period or not. The Contract shall not be fully performed until such permanent corrections are made.

4.6 GENERAL GUARANTY: The Contractor warrants to the Town that all materials and equipment furnished under this Contract will be new unless otherwise specified, and that all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All Work not so conforming to these standards may be considered defective. If required by the Town, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

Neither the final certificate of payment nor any provision in the Contract Documents nor partial or entire occupancy of the premises by the Town 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 therefrom, which shall appear within a period of two (2) years from the date of final acceptance of the work, except where longer periods are specified. If the Contractor shall fail to repair, replace, rebuild or restore such defective or damaged work or equipment promptly after receiving notice, the Town shall have the right to have the work done by others in the same manner as is provided for in Subsection 2.10, TOWN'S RIGHT TO DO WORK.

The Contractor shall further guarantee for a period of 24 months that any building or buildings, constructed under this Project, shall be watertight and leak proof at every point and in every area, except where leaks can be attributed to damage to the building by external forces other than storm or foundation settlement. He shall, immediately upon notification by the Town of water penetration, determine the source of water penetration and, at his own expense, do any work necessary to make the building watertight. He shall also, at his own expense, repair or replace any other damaged material to return the building or buildings to the original accepted condition.

In addition to the foregoing stipulations, the Contractor shall comply with all other guarantees and warranties referred to in any portions of the Contract Documents, the more stringent requirement governing. Unless otherwise specifically stated elsewhere in these Specifications, the date of beginning of all guarantee or warranty periods shall be the date of acceptance of the project.

If for any reason, the Contractor cannot guarantee any part of his work using material or construction methods which have been specified, or shown, he shall notify the Town in writing before Contracts are signed, giving reasons together with the name of product and data on substitutions he can guarantee. Should the Contractor fail to so notify the Town prior to the signing of Contracts, he will be held to have agreed to guarantee all Work specified or shown.

4.7 HANDLING AND DISTRIBUTION: The Contractor shall handle, haul and distribute all materials and all surplus materials on the different portions of the work as necessary or required; shall provide suitable and adequate storage room for materials and equipment during the progress of the work, and be responsible for the protection, loss of, or damage to materials and equipment furnished by him, until the final completion and acceptance of the work.

Storage and demurrage charges by transportation companies and vendors shall be borne by the Contractor.

4.8 MANUFACTURER'S DIRECTIONS: All manufactured articles, material and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturers, unless herein specified to the contrary.

If the specifications or plans are contrary to the manufacturer's directions, the manufacturer shall be contacted by the Contractor before proceeding with the work and the Town advised if the manufacturer has any objections to the specified application.

4.9 MATERIALS, SERVICES AND FACILITIES: It is understood that, except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all labor, supplies and materials, tools, machinery, equipment, transportation, supervision, temporary construction of any nature, and all other services, means and facilities of any nature whatsoever necessary to execute, complete, and deliver the Work within the specified time.

Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the Work. Stored materials and equipment to be incorporated in the Work shall be located so as to facilitate prompt inspection.

Materials, supplies and equipment shall be in accordance with samples submitted by the Contractor and approved by the Town.

4.10 MISCELLANEOUS ITEMS: The work to be done by the Contractor, specified and enumerated under this Contract, shall include any minor details of the Work not specifically mentioned in the Specifications or shown on the Drawings, but obviously necessary for the proper completion of the Work, which shall be

considered incidental and as being a part of and included with the Work for which prices are given in the Bid. The Contractor will not be entitled to any additional compensation therefore.

Miscellaneous items and accessories which are not specifically mentioned, but which are essential to produce a complete and properly operating installation or usable structure or plant, providing the indicated function, shall be furnished and installed without change in the contract price. Such miscellaneous items and accessories shall be of the same quality standards, including material, style, finish, strength, class, weight and other applicable characteristics as specified for the major component of which the miscellaneous item or accessory is an essential part, and shall be approved by the Engineer before installation. The above requirement is not intended to include major components not covered by or inferable from the Drawings and Specifications.

4.11 MISTAKES OF CONTRACTOR: The Contractor shall promptly correct and make good any and all defects, damages, omissions, or mistakes, for which he and/or his agents, servants, employees or subcontractors are responsible, and he shall pay to the Town all costs, expenses, losses, and damages resulting therefrom or by reason thereof as determined by the Town.

4.12 PROTECTION AGAINST ELECTROLYSIS: Where dissimilar metals are used in conjunction with each other, or against concrete surfaces, suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resultant electrolysis. The insulation shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators or washers, or other approved materials.

4.13 RIGHT TO MATERIALS: Nothing in the Contract shall be construed as vesting in the Contractor any right of property in the materials, equipment, apparatus and other items furnished after they have been installed or incorporated in or attached or affixed to the work or the site, but all such materials, equipment, apparatus and other items shall, upon being so installed, incorporated, attached or affixed, become the property of the Town.

4.14 ROYALTIES AND PATENTS: The Contractor shall pay all applicable royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Town harmless from loss on account thereof, except that the Town shall be responsible for all such loss when a particular process or the product of a particular manufacturer or manufacturers is specified, but if the Contractor has information that the process or article specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Town in writing.

4.15 SUBMITTAL SCHEDULE: Within twenty (20) days after execution and delivery of the Contract, the Contractor shall prepare and deliver to the Town a Submittal Schedule. This includes a list of all submittals required under the Contract. The list shall identify each major group of shop drawings, coordination drawings and schedules and each sample and the planned submission date for each.

After the Town's review of the list of submittals, the Town will meet with the Contractor for a joint review and correction and adjustment, as necessary, for agreement on the submittal. In addition, at the meeting the duration of the review period for each submittal will be established. The Contractor's planned submission date for each submittal shall allow no less than fifteen (15) working days for review and appropriate action before approval of the submittal becomes critical to the progress of the Contractor's work. Within five (5) calendar days after the joint review, the Contractor shall make any necessary revisions to the list of submittals, including durations of the review periods, in accordance with the agreements reached during the joint review and submit two revised copies to the Town. No application for partial payment will be approved until the submitted schedule is approved.

For the various Railroad submittals, the Contractor will refer to the enclosed Norfolk Southern-Special Provisions for Protection of Railway Interests. During the Project Preconstruction Meeting, the Contractor will

discuss with the Railroad's Representative the various Railroad submittals and current Railroad schedules; flagging services, ordering Railroad Materials, securing Railroad Forces for railroad signal and surface installation; etc.

4.16 SHOP DRAWINGS: Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are prepared by the Contractor or any Subcontractor, manufacturer, supplier or distributor, and which illustrate some portion of the Work. It shall be the Contractor's responsibility to furnish Shop Drawings as required by the technical specifications or as requested by the Town. These submittals must be made no later than is required by the submittal schedule.

Shop Drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish or shop coat, grease fittings, etc., depending on the subject of the drawing. When it is customary to do so, when the dimensions are of particular importance, or when so specified, the drawings shall be certified by the manufacturer or fabricator as correct for the contract.

When so specified or if considered by the Town to be acceptable, manufacturer's specifications, catalog data, descriptive manner, illustrations, etc., may be submitted for approval in place of shop and working drawings. In such case the requirements shall be as specified for shop and working drawings, insofar as applicable except that the submission shall be in quadruplicate.

The Contractor shall be responsible for the prompt and timely submittal of all shop and working drawings so that there shall be no delay to the work due to the absence of such drawings.

The Contractor shall check the Shop Drawings, shall coordinate them (by means of coordination drawings wherever required) with the work of all trades involved before submission and shall indicate thereon his approval. Drawings and schedules submitted without evidence of the Contractor's approval may be returned for resubmission.

By approving and submitting Shop Drawings, the Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data, or will do so, and that he has checked and coordinated each Shop Drawing with the requirements of the Work and of the Contract Documents.

If drawings or schedules show variations from the contract requirements because of standard shop practice or for other reasons, the Contractor shall describe such variations in his letter of transmittal. If acceptable, the Town may approve any or all such variations and issue an appropriate change order. If the Contractor fails to describe such variations he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such drawings or schedules may have been approved.

Each Shop Drawing or Coordination Drawing shall have a blank area 5 by 5 inches located adjacent to the title block. The title block shall display the following:

- Number and Title of Drawing
- Date of Drawing
- Revision number and date (if applicable)
- Project Title
- Name of project building or facility
- Name of Contractor
- Name of Subcontractor (if applicable)
- Clear identity of contents and location of work

Prior to submitting drawings to the Town, the Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the Drawings and Specifications in all respects. All drawings which are correct shall be marked with the date, checker's name, and indication of the Contractor's approval, and then shall be submitted to the Town; other drawings shall be returned for correction.

The Contractor shall stamp all drawings which are to be submitted to the Town for approval. The stamp shall incorporate the following information:

PROJECT TITLE:

CONTRACTOR'S NAME:

APPROVED BY:

DATE:

SPECIFICATION SECTION :

TRANSMITTAL NO.:

The review of Shop Drawings will be general only and shall not relieve or in any respect diminish the responsibility of the Contractor for details of design, dimensions, etc., necessary for proper fitting and construction of the work as required by the Contract and for achieving the result and performance specified thereunder.

Should the Contractor submit for approval equipment that requires modifications to the structures, piping, layout, etc., detailed on the Drawings, he shall also submit for approval details of the proposed modifications.

If such equipment and modifications are approved, the Contractor, at no additional cost to the Town, shall do all work necessary to make such modifications. Required structural changes shall be designed and detailed by an engineer registered in the state in which the project will be constructed. Drawings shall be signed, dated, and show registration number or may have seal affixed.

Submission of Shop Drawings shall be accompanied by a copy of a transmittal letter containing Project name, Contractor's name, and number of drawings, titles, specifications section, and other pertinent data. The submittal shall include the following:

- Four (4) legible copies of Shop Drawings or printed matter
- One (1) reproducible sepia

The review of Shop Drawings will be performed by the Town as follows:

1. When the submittal conforms fully to the Contract Drawings and Specifications, the Town will approve it. The reproducible of each drawing or page of approved submittals will be stamped approved, signed, dated and returned to the Contractor. No changes shall be made on approved drawings by the Contractor. If the Contractor desires to make any change from approved drawings, or pages of approved submittals, he shall notify the Engineer in writing that the approved material has been withdrawn and shall submit the substitution set in accordance with the above procedure.
2. When the submittal clearly does not conform to the Contract Drawings and Specifications, the Town will disapprove it by stamping it "Rejected". Rejected submittals shall be corrected and resubmitted within fourteen (14) calendar days from the date of rejection. Submittals which are rejected shall not be released for any work.
3. When the submittal has only minor deviations from the Contract Drawings and Specifications, the Town will note the deviations and omissions as may be appropriate and approve the submittal subject to the notations by stamping it "Approved as Noted". Approved as Noted submittals may be released for fabrication of work at the Contractor's risk; in any event the submittal shall be corrected and resubmitted for approval within fourteen (14) calendar days from the date of approval as noted.

The Contractor shall be responsible for delays resulting from the rejection or approval as noted of incomplete, inadequate, incorrect or otherwise unacceptable submittals.

The Contractor shall assure that only drawings and pages of printed material bearing the Town's "Approved" stamp are allowed on the job site.

The Contractor shall submit, at the completion of the Project, one set of all reviewed and correct shop drawings, catalog cuts, and descriptive literature for all Work previously submitted. These sets shall be sent to the Town before final Certificate of Payment is issued.

4.17 OPERATING AND MAINTENANCE MANUALS: One copy of each required Operating and Maintenance Manual must be submitted to the Town with the first submittal of shop drawings. Five additional copies of each required Operating and Maintenance Manual must be submitted to the Town within fourteen (14) days of the return of approved shop drawings to the Contractor. No payment will be approved on any equipment for which Operating and Maintenance Manuals are required until the Operating and Maintenance Manuals are received by the Town. These O&M manuals must be addressed specifically to the piece of equipment supplied and shall not be general in nature; each item must be clearly identified and located. Each page must be printed on 8-1/2" x 11" paper or folded to that size in a manner which will be suitable for insertion in a 3-ring binder.

4.18 SAMPLES: Samples are physical examples furnished by the Contractor to illustrate materials, equipment or workmanship, and to establish standards by which the Work will be judged. It shall be the Contractor's responsibility to furnish samples as required by the technical specifications or as required by the Town. These samples must be submitted no later than is required by the Submittal Schedule.

Each sample shall have a label indicating:

- Project Title
- Name of project building or facility
- Name of Contractor
- Name of Subcontractor (if applicable)
- Identification of material with specification section
- Name of producer and brand (if any)

Samples shall be submitted in duplicate unless otherwise noted in the technical specifications and shall be accompanied by a copy of a transmittal letter containing Project name, Contractor's name, number of samples, specification section and other pertinent data.

If the Town so requires, either prior to or after commencement of the work, the Contractor shall submit samples of materials for such special tests as the Town deems necessary to demonstrate that they conform to the Specifications. Such samples shall be furnished, taken, stored, packed and shipped by the Contractor as directed. Except as otherwise expressly specified, the Contractor shall make arrangements for, and pay for, the tests.

All samples shall be packed so as to reach their destination in good condition. To insure consideration of samples, the Contractor shall notify the Town by letter that the samples have been shipped and shall properly describe the samples in the letter. The letter of notification shall be sent separate from and should not be enclosed with the samples.

The Contractor shall submit data and samples, or place his orders, sufficiently early to provide ample time for consideration, inspection, testing, and approval before the materials and equipment are needed for

incorporation in the work. The consequences of his failure to do so shall be the Contractor's sole responsibility.

In order to demonstrate the proficiency of workmen, or to facilitate the choice among several textures, types, finishes, surfaces, etc., the Contractor shall provide such samples of workmanship of wall, floor, finish, etc., as may be required.

When required, the Contractor shall furnish to the Town triplicate sworn copies of manufacturer's shop or mill tests (or reports from independent testing laboratories) relative to materials, equipment performance ratings, and concrete data.

4.19 STORAGE OF MATERIALS AND EQUIPMENT: All excavated materials, construction equipment, and materials and equipment to be incorporated in the Work shall be placed so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the Work. Materials and equipment shall be kept neatly piled and compactly stored in such locations as will cause a minimum of inconvenience to public travel and adjoining owners, tenants and occupants.

4.20 INSPECTION AND TESTING: All materials and equipment used in the construction of the Project shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the Contract Documents.

The Town shall provide all inspection and testing services not required by the Contract Documents. The Contractor shall provide at his expense the testing and inspection services required by the Contract Documents.

If the Contract Documents, laws, ordinance, rules, regulations or orders of any public authority having jurisdiction require any Work to specifically be inspected, tested, or approved by someone other than the Contractor, the Contractor will give the Town timely notice of readiness. The Contractor will then furnish the Town the required certificates of inspection, testing or approval.

Inspections, tests, or approvals by the Town or others shall not relieve the Contractor from his obligations to perform the Work in accordance with the requirements of the Contract Documents.

The Engineer, the Town and his representatives will at all times have access to the Work. In addition, authorized representatives and agents of any participating Federal or State agency shall be permitted to inspect all work, materials, payrolls, and records of personnel, invoices of materials, and other relevant data and records. The Contractor will provide proper facilities for such access and observation of the Work and also for any inspection or testing thereof.

If any Work is covered contrary to the written instructions of the Town it must, if requested by the Town, be uncovered for his observation and replaced at the Contractor's expense.

If the Town considers it necessary or advisable that covered Work be inspected or tested by others, the Contractor, at the Town's request, will uncover, expose or otherwise make available for observation, inspection or testing as the Town may require, that portion of the Work in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such Work is defective, the Contractor will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such Work is not found to be defective, the Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate Change Order shall be issued.

4.21 SUBSTITUTIONS: The Contractor may recommend the substitution of a material, article, or piece of equipment of equal function for those referred to in the Contract Documents by reference to brand name or catalogue number, and if, in the opinion of the Town, such material, article, or piece of equipment is of equal function to that specified, the Town may approve its substitution and use by the Contractor. Any cost differential shall be deductible from the Contract Price and the Contract Documents shall be appropriately modified by Change Order.

The Contractor warrants that if substitutes are approved, no major changes in the function or general design of the Project will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the Contractor without a change in the Contract Price or Contract Time.

4.22 "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 Town 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.

Whenever a material, article or piece of equipment is identified on the Drawings or in the Specifications by reference to manufacturers' or vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard of quality and function; and, any material, article, or equipment of other manufacturers and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or equipment so proposed, is, in the opinion of the Town, of equal substance and function. It shall not be purchased or installed by the Contractor without the Town's written approval.

4.23 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.

4.24 NO WAIVER: Neither the inspection by the Town or the Engineer, nor any order, measurement, approval, determination, decision or certificate by the Town or the Engineer, nor any order by the Town for the payment of money, nor any payment for or use, occupancy, possession or acceptance of the whole or any part of the work by the Town, nor the extension of time, nor any other act or omission of the Town or of the Engineer shall constitute or be deemed to be an acceptance of any defective or improper work, materials, or equipment nor operate as a waiver of any requirement or provision of the Contract, or of any remedy, power or right of or herein reserved to the Town, nor of any right to damages for breach of contract. Any and all rights and/or remedies provided for in the Contract are intended and shall be construed to be cumulative; and, in addition to each and every other right and remedy provided for herein or by law, the Town shall be entitled as of right to a writ of injunction against any breach or threatened breach of the Contract by the Contractor, by his Subcontractors or by any other person or persons.

4.25 WORK TO CONFORM: During its progress and on its completion, the work shall conform truly to the lines, levels, and grades indicated on the Drawings or given by the Town or the Engineer and shall be built in a thoroughly substantial and workmanlike manner, in strict accordance with the Drawings, Specifications, and other Contract Documents and the directions given from time to time by the Town.

4.26 WORKING HOURS: It is contemplated that all work will be performed during the customary working hours of the trades involved unless otherwise specified in this Contract. Work performed by the Contractor at his own volition outside such customary working hours shall be at no additional expense to the Town.

Any requests received by the Contractor from occupants of existing buildings to change the hours of work shall be referred to the Town for determination.

5. INSURANCE, LEGAL RESPONSIBILITY AND SAFETY

5.1 LITIGATION OF DISPUTES; JURISDICTION: The Town and Contractor agree that this Contract shall be interpreted according to the Laws of the State of South Carolina, and that the appropriate forum and jurisdiction for resolving any disputes and claims shall be the South Carolina Court of Common Pleas for Berkeley Town.

5.2 ASSIGNMENTS: The Contractor shall not assign the whole or any part of this Contract or any monies due or to become due hereunder without written consent of the Town. In case the Contractor assigns all or any part of any monies due or to become due under this Contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any monies 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.

5.3 PERFORMANCE BOND AND PAYMENT BOND: Unless otherwise noted in the Supplemental Conditions, a Performance Bond and a Payment Bond are required. The Contractor shall obtain a Performance Bond and Payment Bond, acceptable to the Town in a surety company authorized to do business in the state in which the Project is constructed, each for the full amount of the Contract Sum. The bonds shall guarantee the Contractor's faithful performance of the Contract and the payment of all obligations arising thereunder. The bonds shall remain in force until:

1. The Project has been completed and accepted by the Town;
2. The provisions of all guarantees required by these Contract Documents have been fulfilled or the time limitation for all guarantees has expired; or
3. The time for the filing of all mechanics' liens has expired, whichever is longer, after which it shall become void.

The Contractor shall pay all charges in connection with the bonds as a part of the Contract. One executed copy of the bonds shall be attached to each copy of the Contract before they are returned for the Town's signature.

If the Contractor defaults, the Contractor or his Surety shall reimburse the Town for any additional Engineering fees for additional services made necessary because of the Contractor's default.

5.4 ADDITIONAL OR SUBSTITUTE BOND: If at any time the Town for justifiable cause, shall be or become dissatisfied with the surety or sureties for the Performance and/or Payment Bonds, the Contractor shall within 5 days after notice from the Town to do so, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Town. The premiums on such bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished such an acceptable bond to the Town.

5.5 CHANGES NOT TO AFFECT BONDS: It is distinctly agreed and understood that any changes made in the Work or the Drawings or Specifications therefore (whether such changes increase or decrease the amount thereof or the time required for its performance) or any changes in the manner or time of payments made by the Town to the Contractor, or any other modifications of the Contract, shall in no way annul, release, diminish or affect the liability of the Surety on the Contract Bonds given by the Contractor, it being the intent hereof that notwithstanding such changes the liability of the Surety on said bonds continue and remain in full force and effect.

5.6 COMPLIANCE WITH LAWS: The Contract shall be governed by the law of the place where the Project is located. The Contractor shall abide by all local and State Laws or ordinances to the extent that such requirements do not conflict with Federal laws or regulations. The Contractor shall keep himself fully informed of all existing and future Federal, State and local laws, ordinances, rules and regulations affecting those engaged or employed on the work, the materials and equipment used in the work or the conduct of the work, and of all orders, decrees and other requirements of bodies or tribunals having any jurisdiction or authority over the same, including, but not limited to the U. S. Department of Labor and Bureau of Standards Safety and Health Regulations for Construction and its amendments as set up under the Williams- Steiger Occupational Safety and Health Act of 1970. If any discrepancy or inconsistency is discovered in the Drawings, Specifications or other Contract Documents in relation to any such law, ordinance, rule, regulation, order, decree or other requirement, the Contractor shall forthwith report the same to the Town in writing.

The Contractor shall at all times observe and comply with, and cause all his agents, servants, employees, and subcontractors to observe and comply with all such existing requirements, and he shall protect, indemnify and save harmless the Town, its officers, agents, servants, and employees, from and against any and all claims, demands, suits, proceedings, liabilities, judgments, penalties, losses, damages, costs and expenses, including attorney's fees, arising from or based upon any violation or claimed violation of any such law, ordinance, rule, regulations, order, decree, or other requirement, whether committed by the Contractor or any of his agents, servants employees, or subcontractors.

5.7 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. 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 be physically amended to make such insertion or correction.

5.8 LIENS: If at any time any notice of liens are filed for labor performed or materials or equipment manufactured, furnished, or delivered to or for the Work, the Contractor shall, at its own cost and expense, promptly discharge, remove or otherwise dispose of the same, and until such discharge, removal or disposition, the Town shall have the right to retain from any monies payable hereunder an amount which, in its sole judgment, it deems necessary to satisfy such liens and pay the costs and expenses, including attorney's fees, of defending any actions brought to enforce the same, or incurred in connection therewith or by reason thereof.

5.9 CLAIMS: If at any time there be any evidence of any claims for which the Contractor is or may be liable or responsible hereunder, the Contractor shall promptly settle or otherwise dispose of the same, and until such claims are settled or disposed of, the Town may retain from any monies which would otherwise be payable hereunder so much thereof as, in its judgment, it may deem necessary to settle or otherwise dispose of such claims and to pay the costs and expenses, including attorneys' fees, of defending any actions brought to enforce such claims, or incurred in connection therewith or by reason thereof.

5.10 INSURANCE: The Contractor shall not commence any work until he obtains, at his own expense, all required insurance. Such insurance must have the approval of the Town as to limit, form, and amount. The Contractor will not permit any Subcontractor to commence work on this project until the same insurance requirements have been complied with by such Subcontractor.

The Contractor shall furnish the Town with certificates showing the type, amount, class of operations covered, effective dates and dates of expiration of policies. Such certificates shall also contain substantially the following statement: "The insurance covered by this certificate will not be canceled or materially altered, except after thirty (30) days notice in writing and delivered by registered mail to the Town." Should any policy be canceled before final payment by the Town to the Contractor and the Contractor fails immediately to

procure other insurance as specified, the Town reserves the right to procure such insurance and to deduct the cost thereof from any sum due the Contractor under this Contract.

Any insurance bearing on adequacy of performance shall be maintained after completion of the project for the full guaranty period. Should such insurance be canceled before the end of the guaranty period and the Contractor fails immediately to procure other insurance as specified, the Town reserves the right to procure such insurance and to charge the cost thereof to the Contractor.

Nothing contained in these insurance requirements is to be construed as limiting the extent of the Contractor's responsibility for payment of damages resulting from his operations under this Contract.

The Contractor is required to obtain and maintain for the full period of the Contract the following types of insurance coverage with limits not less than stated below:

A. WORKMEN'S COMPENSATION INSURANCE

As required by applicable State law for all of his employees to be engaged in work at the site of the project under this Contract and, in case of any such work sublet, the Contractor shall require the subcontractor similarly to provide Workmen's Compensation Insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the Contractor's Workmen's Compensation Insurance. In case any class of employees engaged in hazardous work on the project under this Contract is not protected under the Workmen's Compensation Statute, the Contractor shall provide and shall cause each subcontractor to provide adequate employer's liability insurance for the protection of such of his employees as are not otherwise protected. The minimum limits for Workmen's Compensation insurance shall be the State statutory requirement.

B. COMPREHENSIVE GENERAL LIABILITY

	<u>Bodily Injury Per Person</u>	<u>Bodily Injury Per Incident</u>	<u>Property Damage</u>
Premises and Operations	\$600,000	\$1,000,000	\$600,000
Contractor's Protective Liability	\$600,000	\$1,000,000	\$600,000
Products Liability, Including Completed Operations Coverage	\$600,000	\$1,000,000	\$600,000

C. COMPREHENSIVE AUTOMOBILE LIABILITY

All Owned Automobiles	\$600,000	\$1,000,000	\$600,000
Non-Owned Automobiles	\$600,000	\$1,000,000	\$600,000
Hired Car Coverage	\$600,000	\$1,000,000	\$600,000

D. SUBCONTRACTOR'S LIABILITY INSURANCE

Same limits as required of the General Contractor.

E. RAILROAD INSURANCE

Refer to enclosed Norfolk Southern-Special Provisions for Protection of Railway Interests for the Railroad Insurance Requirements. In addition to all the requirements of the Railroad Protective

Insurance Policy(s) to be furnished to the Railroad Company by the Contractor, the Contractor shall include in the policy or policies the following Railroad identification:

**Tracks owned by Norfolk Southern – Crossing at S-131 (North Maple Street),
RR Milepost: SC-22.96 (Piedmont), DOT Crossing 721470Y,
SCDOT Records Indicate 15 trains a day at 49 MPH with no passenger rail.**

5.11 ORAL AGREEMENTS: No oral order, objection, claim or notice by any party to the others shall affect or modify any of the terms or obligations contained in any of the Contract Documents, and none of the provisions of the Contract Documents shall be held to be waived or modified by reason of any act whatsoever, other than by a definitely agreed waiver or modification thereof in writing, and no evidence shall be introduced in any proceeding of any other waiver or modification.

5.12 SAFETY: In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property affected directly or indirectly by his operations during the performance of the work. This requirement will apply continuously 24 hours per day until acceptance of the work by the Town and shall not be limited to normal working hours.

The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

1. All employees on the Work and all other persons who may be affected thereby;
2. All the Work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or any of Subcontractors or Sub-subcontractors; and
3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

The Contractor shall comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. He shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying Counties and users of adjacent utilities.

When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

The Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated in writing by the Contractor to the Town.

The Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.

The Contractor shall refer to the Norfolk Southern-Special Provisions for Protection of Railway Interests for Railroad Requirements when work on or near the railroad property.

6. PROGRESS AND COMPLETION OF WORK

6.1 NOTICE TO PROCEED: Following the execution of the Agreement by the Town and the Contractor, written Notice to Proceed with the work shall be given by the Town to the Contractor. The Contractor shall begin and shall prosecute the work regularly and uninterruptedly thereafter (except as provided for herein) with such force as to secure the completion of the work within the Contract Time.

6.2 CONTRACT TIME: The Contractor shall complete, in an acceptable manner, all of the work contracted for in the time stated in the Agreement. Computation of Contract Time shall commence the day to be specified in the Notice to Proceed and every calendar day following, except as herein provided, shall be counted as Contract Time.

6.3 SCHEDULE OF COMPLETION: The Contractor shall submit, at such times as may reasonably be requested by the Town, schedules showing the order in which the Contractor proposes to carry on the work, with dates at which the Contractor will start the various parts of the work, and estimated date of completion of each part.

6.4 WORK CHANGES: The Town may, as the need arises, order changes in the work through additions, deletions, or modifications to the extent of 25% of the Contract Amount, without invalidating the Contract. Further changes in the work may be made, with the written agreement of the Contractor, up to the limits allowed by the prevailing Town Procurement Ordinance. Compensation and time of completion affected by the change shall be adjusted at the time of ordering such change.

6.5 EXTRA WORK: New and unforeseen items of work found to be necessary, and which cannot be covered by an item or combination of items for which there is a Contract Price, shall be classed as Extra Work. The Contractor shall do such Extra Work and furnish such materials as may be required for the proper completion or construction of the whole work contemplated, upon written order from the Town as approved by the Engineer. In the absence of such written order, no claim for Extra Work shall be considered. Extra Work shall be performed in accordance with these Contract Documents where applicable and work not covered by such shall be done in accordance with the best construction practice and in a workmanlike manner. Extra Work required in an emergency to protect life and property shall be performed by the Contractor as required.

6.6 EXTENSION OF CONTRACT TIME: A delay beyond the Contractor's control occasioned by an Act of God, by act or omission on the part of the Town or by strikes, lockouts, fire, act of terror, etc., may entitle the Contractor to an extension of time in which to complete the work as agreed by the Town, provided, however, that the Contractor shall immediately give written notice to the Town of the cause of such delay.

Act of God shall mean an earthquake, flood, cyclone or other cataclysmic phenomenon of nature. Rain, wind, flood, or other natural phenomenon of normal frequency, intensity, and duration for the locality shall not be construed as an Act of God and no reparation shall be made to the Contractor for damages to the work resulting therefrom.

All claims for extension of time shall be made in writing to the Town no more than twenty days after the occurrence of the delay; otherwise they shall be waived. In the case of continuing cause of delay only one claim is necessary. Any claim should include complete justification for the extent of the delay claimed.

This Subsection does not exclude the recovery of damages for delay for either party under other provisions of the Contract Documents.

6.7 CERTIFICATE OF SUBSTANTIAL COMPLETION: When the work to be performed under this Contract is substantially completed in accordance with the Contract Documents, the Town shall prepare a Certificate of Substantial Completion to be acknowledged and accepted by the Contractor. The Certificate may list items

to be completed or corrected but such Certificate shall not relieve the Contractor of his obligation to complete all work, whether listed or not, in accordance with the Contract Documents nor will it preclude any right the Town may have for recourse in accordance with the Contract Documents.

6.8 TERMINATION OF CONTRACTOR'S RESPONSIBILITY: The Contract will be considered complete when all work has been finished, and the project accepted in writing by the Town. The Contractor's responsibility shall then cease, except as set forth in his Performance Bond, as provided in Subsection 4.6 entitled GENERAL GUARANTY, and as provided in Subsection 6.9 entitled CORRECTION OF FAULTY WORK AFTER FINAL PAYMENT.

6.9 CORRECTION OF FAULTY WORK AFTER FINAL PAYMENT: The making of the final payment by the Town to the Contractor shall not relieve the Contractor of responsibility for faulty materials or workmanship. The Contractor shall promptly replace any such defects discovered within one year, except where longer periods are specified, from the date of written acceptance of the work.

6.10 PROGRESS SCHEDULE: Within twenty (20) days after execution and delivery of the Agreement and not less than ten (10) days prior to making an application for partial payment, the Contractor shall prepare and deliver to the Town a Progress Schedule in a form approved by the Town.

The schedule shall show the dates of commencement and completion of the various subdivisions of work required by the Contract Documents and all activities required to accomplish the work.

The schedule shall be updated monthly. No progress payments will be made unless application is accompanied by the updated schedule.

6.11 SCHEDULES, REPORTS AND RECORDS: The Contractor shall submit to the Town such schedules of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the Contract Documents for the Work to be performed.

The Contractor shall also submit, in a format as approved by the Town, a schedule of payments that he anticipates he will earn during the course of the Work.

6.12 ABANDONMENT OF WORK OR OTHER DEFAULT: If the work shall be abandoned, or any part thereof shall be sublet without previous written consent of the Town, or the Contract or any monies payable hereunder shall be assigned otherwise than as herein specified, or if at any time the Town shall be of the opinion, and shall so certify in writing, that the conditions herein specified as to rate of progress are not being complied with, or that the work or any part thereof is being unnecessarily or unreasonably delayed, or that the Contractor has violated or is in default under any of the provisions of the Contract, or if the Contractor becomes bankrupt or insolvent or goes or is put into liquidation or dissolution, either voluntarily or involuntarily, or petitions for an arrangement or reorganization under the Bankruptcy Act, or makes a general assignment for the benefit of creditors or otherwise acknowledges insolvency, the happening of any of which shall be and constitute a default under the Contract, the Town may notify the Contractor in writing, with a copy of such notice mailed to the Surety, to discontinue such work or any part thereof; thereupon the Contractor shall discontinue such work or such part thereof as the Town may designate; and the Town may, upon giving notice, by contract or otherwise as it may determine, complete the work or such part thereof and charge the entire cost and expense of so completing the work or such part thereof to the Contractor. In addition to the said entire cost and expense of completing the work, the Town shall be entitled to reimbursement from the Contractor and the Contractor agrees to pay the Town any losses, damages, costs and expenses, including attorney's fees, sustained or incurred by the Town by reasons of any of the foregoing causes. For the purposes of such completion the Town may for itself or for any contractors employed by the Town take possession of any and use or cause to be used any and all materials, equipment, plant, machinery, appliances, tools, supplies and such other items of every description that may be found or located at the site

of the Work. No equipment or materials may be removed from the Work without the written consent of the Town.

All costs, expenses, losses, damages, attorney's fees and any and all other charges incurred by the Town under this Subsection shall be charged against the Contractor and deducted and/or paid by the Town out of any monies due or payable or to become due or payable under the Contract to the Contractor. In computing the amounts chargeable to the Contractor, the Town shall not be held to a basis of the lowest prices for which the completion of the work or any part thereof might have been accomplished, but all sums actually paid or obligated therefore to effect its prompt completion shall be charged to and against the account of the Contractor. In case the costs, expense, losses, damages, attorney's fees and other charges together with all payments theretofore made to or for the account of the Contractor are less than the sum which would have been payable under the Contract if the work had been properly performed and completed by the Contractor, the Contractor shall be entitled to receive the difference and, in case such costs, expenses, losses, damages, attorney's fees and other charges, together with all payments theretofore made to or for the account of the Contractor, shall exceed the said sum, the Contractor shall pay the amount of the excess to the Town.

7. PAYMENTS TO THE CONTRACTOR

7.1 PRICES FOR WORK: The Town shall pay and the Contractor shall receive the prices stipulated in the Bid made a part hereof as full compensation for everything performed and furnished and for all risks and obligations undertaken by the Contractor under and as required by the Contract.

7.2 SCHEDULE OF VALUES: Except in cases where unit prices form the basis for payment under the Contract, the Contractor shall, within twenty (20) days of the execution of the Contract and not less than ten (10) days prior to making an application for partial payment, submit to the Town in a form approved by the Town a schedule of values showing a breakdown of the Contract Sum itemized by trade and/or specification sections or as otherwise directed by the Town and for each item shall show the total value including the Contractor's overhead and profit. Upon approval by the Town, this schedule will be used in determining the value of the work done for the purpose of partial payments.

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 additions to or deductions from the Contract Price.

7.3 APPLICATIONS FOR PARTIAL PAYMENT: Before the tenth day of each month, or as otherwise directed by the Town, the Contractor shall make applications for the value of the work done and the materials installed and/or delivered to the site for installation in the project during the previous month. Such applications shall show the breakdown of the project into the same items as the schedule of values specified in Subsection 7.2 entitled SCHEDULE OF VALUES and showing for each item the total value, the value previously reported as complete, the value completed during the month, the cumulative value completed and the value remaining to be done. The application shall also show the value of materials delivered to the site which have not been incorporated into the work and whose value is not included in the amount shown for the work of which they are a part. The value of such materials shall be established by attaching copies of invoices covering the materials included in the application. The application shall include a summary of value of the work performed during the previous month, plus the value of the material delivered to the job site but not incorporated in the work, and minus the amount of the retainage indicated in Subsection 7.4 entitled RETAINAGE.

The Town will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate for payment, or return the partial payment estimate to the Contractor indicating in writing his reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate.

7.4 RETAINAGE: The Town shall retain ten (10) percent of the amount of each payment until final completion and acceptance of all work covered by the Contract Documents. The Town at any time, however, after fifty (50) percent of the work has been completed, if he finds that satisfactory progress is being made, will make further partial payments in full on the current and remaining estimates, but amounts previously retained shall not be paid to the Contractor at fifty (50) percent completion or any time thereafter when, in the opinion of the Owner, the progress of the Work is not satisfactory, additional amounts may be retained but in no event shall the total retainage be more than ten (10) percent of the value of the work completed. Upon substantial completion of the work, any amount retained may be paid to the Contractor. When the Work has been substantially completed except for Work which cannot be completed because of weather conditions, lack of materials or other reasons which in the judgment of the Town are valid reasons for non-completion, the Town may make additional payments, retaining at all times an amount sufficient to cover the estimated cost of the Work still to be completed.

7.5 PAYMENTS WITHHELD: The Town may withhold payment or, on account of subsequently discovered evidence, nullify the whole or part of any application to the extent necessary to protect himself from loss on account of:

1. Defective work not remedied.
2. Claims filed or reasonable evidence indicating the probable filing of claims.
3. Failure of the Contractor to make payments to Subcontractors, material suppliers, or employees.
4. A reasonable doubt that the Contract work can be completed for the balance unpaid.
5. Damage to another contractor.

When the above grounds are removed, payment will be made for the amounts withheld because of them.

7.6 PAYMENT OF APPLICATIONS FOR PARTIAL PAYMENT: Upon verification and approval of the application for partial payment made as specified, the Town will make payment of the amount found properly due. No payment made to the Contractor nor partial or entire use or occupancy of the Work by the Town shall be an acceptance of any work or materials not in accordance with this Contract.

7.7 FINAL INSPECTION: Upon receipt of written notice from the Contractor that the work has been completed and finished in accordance with the Contract, the Town shall cause an inspection to be made of the work by his authorized representatives. A list shall be made of all deviations from the Contract requirements (commonly termed "punch list") and a copy of such list furnished to the Contractor. The Contractor shall with reasonable haste remedy all defects so noted and shall notify the Town upon the completion of such work. When inspection by the Town's authorized representatives shows the work to be complete in accordance with the Contract, application for final payment may be made.

7.8 RELEASE OF LIENS: Neither the final payment nor any part of the retained percentage shall become due until the Contractor shall deliver to the Town a complete and notarized release of all liens arising out of this Contract, or receipts in full in lieu thereof, and if required in either case, an affidavit that so far as he had knowledge of information the releases and receipts include all the labor and material for which a lien could be filed; but the Contractor may, if any Subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Town, to indemnify him against any lien. If any lien remains unsatisfied after all payments are made, the Contractor shall refund to the Town all monies that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

7.9 USE OR PARTIAL PAYMENT NOT ACCEPTANCE: It is agreed that this is an entire contract for one whole and complete work or result and that neither the Town's entrance upon or use of the Work or any part thereof nor any partial payments by the Town shall constitute an acceptance of the Work or any part thereof before its entire completion and final acceptance.

7.10 PAYMENT FOR UNCORRECTED WORK: Should the Town direct the Contractor not to correct work that has been damaged or that was not performed in accordance with the Contract Documents, an equitable deduction from the Contract Amount shall be made to compensate the Town for the Uncorrected Work.

7.11 PAYMENT FOR REMOVAL OF REJECTED WORK AND MATERIALS: The removal of work and materials rejected in accordance with Subsection 4.3 entitled CORRECTION OF WORK BEFORE COMPLETION and the re-execution of acceptable work by the Contractor shall be at the expense of the Contractor, and he shall pay the cost of replacing the work of other contractors destroyed or damaged by the removal of the rejected work or materials and the subsequent replacement of acceptable work.

Removal of rejected work or materials and storage of materials by the Town, in accordance with Subsection 4.3 entitled CORRECTION OF WORK BEFORE COMPLETION, shall be paid by the Contractor within thirty (30) days after written notice to pay is given by the Town. If the Contractor does not pay the expenses of such removal and after ten (10) days' written notice being given by the Town of his intent to sell the materials, the Town may sell the materials at auction or at private sale and will pay the Contractor the net proceeds therefrom after deducting all the costs and expense that should have been borne by the Contractor.

7.12 PAYMENT FOR EXTRA WORK: Written notice of claims for payment for Extra Work shall be given by the Contractor within ten days after receipt of instructions from the Town to proceed with the Extra Work and also before any work is commenced, except in emergency endangering life or property. No claim shall be valid unless so made. In all cases, the Contractor's itemized estimate sheets showing all labor and material shall be submitted to the Town. The Town's order for Extra Work shall specify any extension of the Contract Time and one of the following methods of payment:

1. Unit price or combinations of unit prices which form the basis of the original Contract.
2. A lump sum based on the Contractor's estimate and accepted by the Town.
3. Net cost plus a fixed fee. Net costs are defined as follows:
 - 3.1 Labor costs, including time of foreman while engaged directly upon extra work at rates not greater than the scale of rates for each respective classification of labor customary in the area where the work is performed for each respective job classification.
 - 3.2 Labor insurance taxes including amounts paid on a percent of such labor rates or on a cents per hour basis for Workmen's Compensation, Public Liability, Contractor's Contingent Liability and Contractual Liability Insurance and all Federal Old Age and Unemployment Taxes and any other taxes applicable as well as fringe benefits as may be approved by the Engineer.
 - 3.3 Materials and supplies actually used on the work.
 - 3.4 Rental charges for necessary equipment, as agreed upon by the Town and Contractor. Rental charges shall not exceed those published in Rental Rates for Construction Equipment issued by the American Equipment Distributor. Equipment and tools having a value of \$100.00 or less are considered to be "small tools" and, as such, are considered to be part of overhead.

To the cost under (3) there shall be added a fixed fee to be agreed upon but not to exceed fifteen (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. On work performed by Subcontractors, the fixed fee shall not exceed five (5) percent of the cost of the work.

7.13 PAYMENT FOR WORK SUSPENDED BY THE TOWN: If the work or any part thereof shall be suspended by the Town and abandoned by the Contractor as provided in Subsection 2.12 entitled SUSPENSION OF WORK, TERMINATION AND DELAY, the Contractor will then be entitled to payment for all work done on the portions so abandoned, plus fifteen (15) percent of the value of the abandoned work to compensate for overhead, plant expense, and anticipated profit.

7.14 PAYMENT FOR WORK BY THE TOWN: The cost of the work performed by the Town, in accordance with Subsection 2.10 entitled TOWN'S RIGHT TO DO WORK, shall be paid by the Contractor.

7.15 PAYMENT FOR WORK BY THE TOWN FOLLOWING TERMINATION OF CONTRACT BY TOWN: Upon termination of the Contract by the Town in accordance with Subsection 2.11 entitled TOWN'S RIGHT TO TERMINATE CONTRACT, no further payment shall be due the Contractor until the work is completed. If the unpaid balance of the Contract Amount shall exceed the cost of completing the work including all overhead costs, the excess shall be paid to the Contractor. If the cost of completing the work shall exceed the unpaid balance, the Contractor shall pay the difference to the Town. The cost incurred by the Town, as herein provided, and the damage incurred through the Contractor's default, shall be certified by the Town.

7.16 PAYMENT FOR SAMPLES AND TESTING OF MATERIALS: Samples furnished in accordance with Subsection 4.18 entitled SAMPLES, shall be furnished by the Contractor at his expense.

7.17 ACCEPTANCE AND FINAL PAYMENT: When the Contractor shall have completed the work in accordance with the terms of the Contract Documents, he shall certify completion of the work to the Town and submit a final Request for Payment, which shall be the Contract Amount plus all approved additions, less all approved deductions and less previous payments made. The Contractor shall furnish evidence that he has fully paid all debts for labor, materials, and equipment incurred in connection with the work, and, upon acceptance by the Town, the Town will release the Contractor except as to the conditions of the Performance Bond and the Payment Bond, any legal rights of the Town, required guaranties, and Correction of Faulty Work after Final Payment, and will pay the Contractor's final Request for Payment. The Contractor shall allow sufficient time between the time of completion of the work and approval of the final Request for Payment for the Engineer to assemble and check the necessary data.

The Contractor shall deliver to the Town a complete release of all liens arising out of this Contract before the retained percentage or before the final Request for Payment is paid.

7.18 ACCEPTANCE OF FINAL PAYMENT AS RELEASE: The acceptance by the Contractor of final payment shall be and shall operate as a release to the Town of all claims and all liability to the Contractor other than claims in stated amounts as may be specifically excepted by the Contractor for all things done or furnished in connection with this Work and for every act and neglect of the Town and others relating to or arising out of this Work. Any payment, however, final or otherwise, shall not release the Contractor or his sureties from any obligations under the Contract Documents or the Performance Bond and the Payment Bond.

7.19 DELAYS AND DAMAGES: The date of beginning and the time for completion of the Work are essential conditions of the Contract Documents and the Work embraced shall be commenced on a date specified in the Notice to Proceed. The Contractor will proceed with the Work at such rate of progress to insure full completion within the Contract Time. It is expressly understood and agreed by and between the Contractor and the Town that the Contract Time for the completion of the Work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the Work. If the Contractor refuses or fails to prosecute the Work, or any separable part thereof, with such diligence as will insure its completion within the time specified in the Contract, or any extension thereof, or fails to complete said Work within such time, the Town may, by written notice to the Contractor and his Surety, terminate his right to proceed with the Work or such part of the work as to which there has been

delay. In such event the Town may take over the Work and prosecute the same to completion, by contract or otherwise, and may take possession of and utilize in completing the work such materials, appliances, and plant as may be on the site of the work and necessary therefore. Whether or not the Contractor's right to proceed with the Work is terminated, he and his sureties shall be liable for any damage to the Town resulting from his refusal or failure to complete the Work within the specified time.

If fixed and agreed penalties are provided in the Contract and if the Town so terminates the Contractor's right to proceed, the resulting damage will consist of such penalties until such reasonable time as may be required for final completion of the Work together with any increased costs occasioned the Town in completing the Work.

If fixed and agreed penalties are provided in the Contract, and if the Town does not so terminate the Contractor's right to proceed, the resulting damage will consist of such penalties until the Work is completed and accepted.

The Contractor's right to proceed shall not be so terminated nor the Contractor charged with resulting damage if:

1. The delay in the completion of the Work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, Acts of God, acts of the public enemy, acts of the Government in either its sovereign or contractual capacity, acts of another contractor in the performance of a contract with the Town, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather, or delays of subcontractors or suppliers arising from unforeseeable causes beyond the control and without the fault or negligence of either the Contractor or such subcontractors or suppliers; and
2. The Contractor, within ten (10) days from the beginning of any such delay (unless the Town grants a further period of time before the date of final payment under the Contract), notifies the Town in writing of the valid causes of delay.

As used in subparagraph 1, above, the term "subcontractors or suppliers" means subcontractors or suppliers relied upon proximate with the delay.

The Engineer shall ascertain the facts and the extent of the delay and extend the time for completing the Work when, in his judgment, the findings of fact justify such an extension, and his findings of fact shall be final and conclusive on the parties, subject only to appeal as provided in these General Conditions.

The rights and remedies of the Town provided in this clause are in addition to any other rights and remedies provided by law or under this Contract.

SECTION 6

Section 6 Documents:

Special Provisions

Attachment A – North Maple Special Provisions and Utility Window.

Attachment B – In-contract DCW&S Bid Package / Standard Specifications Signal Special Provisions.

Attachment C: Norfolk Southern- Special Provisions for Protection of Railway Interests

Attachment D: Norfolk Southern - Contractor Right of Entry Agreement

Attachment E: Norfolk Southern – Railroad Signal Plans (For Information Only)

Attachment F: Norfolk Southern Checklist for Construction

Attachment G: Permits

SPECIAL PROVISIONS

PROJECT DESCRIPTION

The work includes grading, drainage, and paving for S-59 (Parsons Road), S-131 (North Maple Street), S-65 (W Richardson Avenue, and US 78 (W 5th N Street). Work also includes the relocation of S-59 (Parsons Road), pavement markings, signing, and traffic control for the entire project, and street lighting along S-131 (North Maple Street). The project also includes traffic signal installation, in-contract sewer line relocation, railroad and utility coordination. The total estimated roadway length of the project is approximately 2.22 miles.

DEFINITIONS AND TERMS

The **TOWN** shall be the legal entity and shall make final interpolations of definitions and terms as applied to this project.

The **OWNER** - shall mean **Town of Summerville** including its elected or appointed officials, employees, designated agents and volunteers.

The **SPONSER** - shall mean **Town of Summerville** including its elected or appointed officials, employees, designated agents and volunteers in the Railroad Special Provisions.

The Engineer – shall mean **Michael Baker International, Inc.** including Employees, and Subconsultants to **Michael Baker International, Inc.**

SCDOT - may also include **TOWN**.

Contracts Engineer - shall mean **TOWN**, Engineer or designee.

Department - may also include **TOWN** and **Michael Baker International, Inc.**

State Highway Engineer - may also include **TOWN**, Engineer or designee.

Director of Construction - may also include **TOWN**, Engineer or designee.

Research and Materials (OMR) Lab - may also include the **TOWN's** assigned materials and testing lab.

Resident Construction Engineer - may also include **TOWN**, Engineer, **Michael Baker International, Inc.** or Subconsultant to the Engineer or designee.

Railroad – shall mean Norfolk Southern Railroad in the Railroad Special Provisions.

Contractor - shall mean the Town's Prime Contractor in the Railroad Special Provisions

GENERAL

1. All workmanship and material provided on this project shall conform with the requirements contained in the "South Carolina Department of Transportation (SCDOT) Standard Specifications for Highway Construction, Edition of 2007", book of Standard Drawings for Road Construction, and all applicable Supplemental Specifications. This includes but is not limited to SCDOT traffic signal specifications.
2. In the Bid Proposal Form and Schedule, contract items are given a unique seven (7) digit Item Number. The first three (3) digits correspond to sections of the SCDOT Standard Specifications and each contract item shall be constructed in accordance with the section of the SCDOT Standard Specifications as denoted by the first three digits unless otherwise covered by contract Special Provisions and Supplemental Specifications. The remaining four (4) digits are for individual identification of each contract item.
3. Temporary Lane closure shall be conducted in accordance with SCDOT standard drawings and as directed by the Engineer. Hourly lane closures restrictions are as follows:

S-131 (North Maple Street) from US 78 to north end of the project

Monday through Friday – 6 AM to 9 AM & 3 PM to 7 PM

Saturday through Sunday - 11 AM to 7 PM

S-65 (Richardson Ave)

Daily – 6 AM to 9 PM

US 78

Monday through Friday – 6 AM to 9 AM & 12 PM (noon) to 7 PM

Saturday through Sunday - 11 AM to 7 PM

Road Closures must be approved by the Owner. If road closures are implemented, the traveling public shall be notified by the use of message boards, news broadcasts, newspapers or other approved method for a minimum of seven (7) consecutive calendar days prior to road closure. The Contractor shall submit a Traffic Control Plan to the Engineer seven (7) calendar days prior to a closure. The Traffic Control Plan must be approved by the OWNER prior to implementing.

Temporary lane closures may be required for Railroad Forces to install railroad/highway crossing surface and railroad signals/appurtenances. The Contractor shall coordinate for Railroad's work.

4. The Contractor shall maintain on file at the job site, copies of the following permits and approvals for the project:

SCDHEC Notice of Intent (NOI)

United States Army Corps of Engineers Permit No. SAC – 2014 – 00855

Tree Removal Permit

Fully executed Norfolk Southern Contractor Right of Entry Agreement

Railroad approved Railroad Protective Liability Insurance

Railroad approved Commercial General Liability and Automobile Liability Insurance

A SCDOT Encroachment permit was not required for this project.

The Contractor shall secure all other permits required for construction activities prior to beginning construction.

5. The Contractor shall notify the South Carolina Department of Health and Environmental Control regional office forty-eight (48) hours prior to commencement of work.
6. Quality Assurance Testing shall be conducted on an as needed basis and at the discretion of the Engineer following the procedures defined in the SCDOT Standard Specifications. Contractor shall be responsible for Quality Control.

Contractor shall be responsible for all Quality Control testing and for having an independent testing firm test all material used in the construction of these facilities as specified in all SCDOT specifications. Testing may include but is not limited to Earthwork, Asphalt, Reinforcing Steel, and Concrete Quality Control testing. All testing shall be in accordance with all SCDOT specifications. All costs associated with testing shall be the responsibility of the Contractor and considered incidental to the cost of the project.

7. Contractor shall provide all record drawing information to the Engineer prior to final approval.
8. The Contractor shall file a Notice of Termination (NOT) with the South Carolina Department of Health and Environmental Control upon project acceptance.
9. Redlined markups of the final plans documenting any changes or modifications to the final plan dimensions, elevations, or details shall be provided to the Town of Summerville prior to receiving final acceptance of the project. This shall be paid for using the As-Built pay item.
10. Delays or failures of performance shall not constitute breach of Agreement if and to the extent such delays or failures of performance are caused by severe and not reasonably foreseeable occurrences beyond the control of the TOWN, SCDOT, ENGINEER or CONTRACTOR, including, but not limited to: Acts of God or the public enemy; expropriation or confiscation of facilities; compliance with any order or request of any governmental authority other than the COUNTY, SCDOT or ENGINEER or a party in privity with it; a change in law directly and substantially affecting performance of the Project; Acts of War; rebellion or sabotage or damages resulting there from; fires, floods, explosions, or extraordinary accidents; riots or strikes or other concerted acts of workman, whether direct or indirect, or any similar causes, which are not within the control of the TOWN, SCDOT, ENGINEER or CONTRACTOR respectively, and which by the exercise of reasonable diligence, the TOWN, SCDOT, ENGINEER or CONTRACTOR are unable to prevent. Any expense attributable to such occurrence shall not entitle CONTRACTOR to an adjustment in the contract price. Any critical path delay attributable to such an occurrence shall be added to the Contract Time.
11. The Contractor shall have a CEPSI certified representative on the project. The representative shall prepare all necessary storm water reports and inspections of the site as per the permit. The certified CEPSI representative will also be required to submit these reports to DHEC, the Engineer, and the Town accordingly. All costs associated with this task shall be considered incidental to the project.

12. It is anticipated that Notice to Proceed will be given on or before January 1, 2023.
13. The Contractor shall be complete with the clearing and grubbing and staking operations no later than March 31, 2023.
14. The Town of Summerville is revising the design along US 78 and will provide the revised sheets after project is awarded and after SCDOT approval. Any work along S-131 (North Maple Street) from Station 90+00.00 to Station 105+00.00 and all work along US 78 shall not be performed until the Contractor receives approval from the Town Engineer. The quantities for this work are included in the bid schedule and no change order will be issued.
15. The Town of Summerville is revising the design around Station 120+00.00 to add a right turn lane and will provide the revised sheets after SCDOT approval. The contractor shall limit work in this area until revisions are provided to avoid rework. The quantities for this work are included in the bid schedule and no change order will be issued
16. The 401 WQC permit stipulates that clearing shall only occur between November 15 thru March 31st. For clearing to occur outside of this window, a bat survey must be conducted to ensure no bats are present. If clearing outside of this window is due to contractor scheduling, payment for survey will be the responsibility of the contractor.
17. The Contractor shall obtain the tree removal permit from the Town of Summerville. The permit application has been submitted to the Town and the Town will approve once the Contractor informs the Town on who will be performing the tree cutting services. No tree work can be done without the permit.
18. All existing mailboxes effected by construction activities shall be retained or relocated as directed by Engineer. Mailboxes along North Maple Street and Parsons Road are to be placed on the same side of the street as the property and parallel to the roadway. Mailboxes shall be accessible at all times.
19. Cleaning of existing outfalls shall be paid for under clearing and grubbing.
20. The Contractor shall saw-cut existing pavement edges at edge of travelway to make a uniform tie-in joint for curb and gutter placement. The pavement is to be clean of all loose debris. Payment for this work shall be paid for under removal of existing asphalt pavement.
21. The Contractor shall coordinate with the Town of Summerville to ensure that the signs meet their standards before installation. This work shall be paid for under the Street Sign bid item and shall include all material and labor.
22. Contractor shall verify topo at the places below as conditions may vary from what is shown in the plans. This list may not include all tracts with changes and it is the Contractor's responsibility to verify.
 - a. Tract 37
 - b. Tract 43
23. Overhaul will not be paid for separately and will be included in the cost of Unclassified Excavation.

24. NP-16-13 to have additional foundation work per Standard Drawing 714-020-00 and to be backfilled with flowable fill material. See sheet D16 and D16A.
25. The Contractor shall discuss with Railroad Representative the asphalt elevation of the railroad/at-grade crossing to provide a smooth tie-in.

PROPERTY

1. Reconstruction of driveways and other special provisions on properties shall be coordinated with the individual property owners and the Engineer. Contractor shall notify Engineer prior to construction of any and all driveways.
2. No construction beside clearing and grubbing for utilities shall take place on Tract 96 until approval is received from the Engineer. This will allow for the relocation of a billiard sign.
3. The Contractor shall coordinate with the Town before removing the building on Tract 44 as the Town may want to relocate the building.
4. The Contractor shall install a 4' chain link fence around the sides and back property lines of Tract 65. The Contractor shall coordinate with the Town and property owner on the location of the fence and double gate for cars.

RAILROAD

1. Norfolk Southern Railroad is within the project limits.
The scope of this project requires working on Norfolk Southern Railway, herein also referred to as Railroad, property. The Contractor shall adhere to the Norfolk Southern – Special Provisions for Protection of Railway Interests (Railroad Special Provisions), dated July 23, 2018, updated March 11, 2021, included on page. The Railroad Special Provisions outline specific requirements and procedures the Contractor must follow prior to, and while, working on Railroad Property, including but not limited to, Right of Entry Agreement, Flagging, Railroad Protective Liability, and other requirements. The Contractor is responsible for adhering to Railroad Special Provisions and familiarizing himself/herself with Railroad specific procedures and safety requirements. Should bid documents conflict with Railroad Special Provisions, the conflict shall be brought to the attention of the Town Engineer, and Railroad Special Provisions will govern.

The Contractor shall include the following Railroad identification in all submittals to the Railroad:

**Tracks owned by Norfolk Southern – Crossing at S-131 (North Maple Street),
RR Milepost: SC-22.96 (Piedmont), DOT Crossing 721470Y,
NS FILE: CX1113215**

Below is a list of Railroad and SCDOT representatives who shall be invited to the Project's Preconstruction Meeting.

Jeffrey W. Brittain, PE, jbrittain@tgsengineers.com
Stephanie Higdon, shigdon@tgsengineers.com

Jacob Watson, Jacob.Watson@nscorp.com
Sonny Alderman, lynn.alderman@nscorp.com
Eric Wessinger, WessingeJE@scdot.org
Jamie Fowler, FowlerJE@scdot.org

2. Work that will require railroad flagging operations or take place on the railroad's property shall be completed within a 180 consecutive calendar day period. This includes any work to be performed by the Contractor and the Railroad Forces. If flagging operations are required for more this 180 consecutive calendar day period, it will be at the contractor's expense.

3. Railroad Signals and At-Grade Crossing.

Norfolk Southern Forces will install the railroad signals/appurtenances and rail-highway at-grade crossing surface. The Contractor shall be responsible for coordinating these services with Norfolk Southern's Representative to keep the project on schedule. The Town will pay Norfolk Southern's Invoices for these installations. The Contractor shall also coordinate with the SCDOT Railroad Safety Office for approval of the installation of the railroad crossing and warning devices.

4. The Contractor shall refer to the Norfolk Southern-Special Provisions for Protection of Railway Interests for Railroad Requirements.
5. The Contractor shall complete the Norfolk Southern Check List for Construction that is in Attachment F.
6. The Contractor is required to submit the Norfolk Southern Contractor Right of Entry Agreement that is in Appendix D for execution and approval to the Railroad.
7. For the various Railroad submittals, the Contractor will refer to the enclosed Norfolk Southern-Special Provisions for Protection of Railway Interests. During the Project Preconstruction Meeting, the Contractor will discuss with the Railroad's Representative the various Railroad submittals and current Railroad schedules; flagging services, ordering Railroad Materials, securing Railroad Forces for railroad signal and surface installation; etc.

UTILITIES

1. Upon completion of the clearing and grubbing and construction staking, the Contractor shall notify the Town Engineer by letter. Once the Town Engineer has been notified that clearing and grubbing, erosion control, and staking operations on the road are complete, a specified 180-day utility window shall begin. The Town Engineer shall establish the beginning and end date of the utility windows.

During this utility window, the Contractor will not be allowed to perform any work activities unless approved by the Town Engineer. If work activities are approved, they should in no way hinder or interfere with the utility relocations during the utility window provided. If work activities interfere with utility relocations, all work by the prime contractor and subcontractors will be suspended until the end of the utility window.

2. Construction conditions requiring minor vertical adjustments (two (2) feet or less) to existing water line valve boxes, sanitary sewer manholes, and other minor appurtenances shall be the responsibility of the Contractor. The costs for the adjustments shall be the contractor's responsibility and shall be included in the cost of the other items, unless paid for separately. Other utilities requiring relocation or adjustment for construction activities will be the responsibility of the utility owner.
3. The Contractor shall coordinate with the utility owners and the Engineer to accomplish the utility construction within the total project schedule. The engineer has started the utility coordination process by notifying all known utility owners and providing them a set of the plans. The names of the utility companies with utility service in the project limits can be found on Sheet 6 of the plans. All utility owners with possible conflicts have been notified. All utility owners shall be invited to attend a meeting prior to any construction work in the field. All utility coordination henceforth shall be the responsibility of the contractor. A regularly scheduled coordination meeting is suggested to be coordinated and held by the Contractor. Below is a list of utility coordination completed to-date:
 - a. **Dominion Energy – Distribution:** Power poles along Richardson Avenue, North Maple Street and US-78 conflict with the road widening and will relocate to new right of way or easements. Most Power poles along Parsons Road will remain in place other than a few pole adjustments for proposed driveway adjustments. Dominion will be required to acquire an encroachment permit from Norfolk Southern Railroad for their new underground crossing of the railroad along North Maple Street. Overhead power along North Maple Street will be relocated underground at the request of the Town of Summerville. Dominion Energy plans to complete their work during the projects scheduled utility window.
 - b. **Summerville CPW – Water:** Summerville CPW will relocate along Richardson Avenue, North Maple Street, US-78, and part of Parsons Road. At most locations, they will locate inside new right of way. Summerville CPW has requested to remain in place along US-78 from near Station 403+00 to near Station 410+00. No conflicts are anticipated, but Summerville CPW should be notified if one arises so an offset can be installed to clear the conflict. Summerville CPW will also have meters, services, and fire hydrants that will also have to be either adjusted or relocated. Summerville CPW will be required to acquire an encroachment permit from Norfolk Southern Railroad for their crossing along North Maple Street. Summerville CPW plans to complete their work during the projects scheduled utility window.
 - c. **Dorchester County Water & Sewer:** DCW&S has requested permission from SCDOT to remain in place under the pavement with gravity sewer where they are not in conflict with new drainage. DCW&S will add a section of gravity sewer along US-78 in private easement where service adjustments could not be made to clear proposed ditch cuts or drainage. DCW&S will relocate forced main out from proposed pavement to new right of way along North Maple. Dorchester County Water and Sewer will have their work included in the roadway improvement contract. Dorchester County Water and Sewer will need to relocate their forced main early at the intersection of US-78 and North Maple due to depths, prior to the installation of the Summerville CPW water main which is being relocated at a shallower depth.

- d. **Dominion Energy Gas:** Dominion received permission from SCDOT to remain in place under the pavement where they are not in conflict with new drainage or grade changes along Parsons Road. The contractor shall be mindful of any gas mains remaining and should pothole at any ditch cuts. No conflicts are expected, but if any conflict arises, the contractor shall contact Dominion Energy for a vertical offset. Dominion will relocate within new right of way where conflicts exist in other portions of the project. Dominion will retire a large portion of their gas lines along North Maple Street between the Norfolk Southern Railroad and US-78. Dominion Energy plans to complete their work during the projects scheduled utility window.
 - e. **AT&T:** AT&T's buried lines were predominately in conflict with this project and will be relocated outside the pavement, inside the proposed right-of-way. All telephone pedestals and services were also addressed with their overall relocations. AT&T plans to complete their work during the projects scheduled utility window.
 - f. **Charter / Spectrum:** Charter / Spectrum will have to relocate at every pole that Dominion relocates. They will also have to adjust some minor service drops and pedestals that may be impacted. Charter / Spectrum will be included in the Dominion Energy Joint Use Duct Bank where Dominion transitions to underground power along North Maple Street. Charter / Spectrum plans to complete their work during the projects scheduled utility window subject to the Dominion Energy schedule.
 - g. **Segra:** Segra underground fiber has multiple pavement and storm drain conflicts within the project footprint along US-78 and along North Maple Street north of US-78 and will be relocating to new ROW to clear conflicts. Segra will also coordinate with Dominion Energy on the Joint Use Duct Bank at their bore at the North Maple / US-78 intersection. Segra plans to complete their work during the projects scheduled utility window.
4. Installation of conduit for street lighting is included this project. The lighting design is not completed at this time and the revised sheets will be provided after project award. The quantities for this work are included in the bid schedule and no change order will be issued.

Dominion Distribution has requested 30-inch minimum cover on the lighting conduit and a pull string be added.

Attachment A – North Maple Special Provisions and Utility Window

PROJECT ID
P030733

COUNTY
DORCHESTER

**COORDINATION OF UTILITY RELOCATION WORK WITH HIGHWAY CONSTRUCTION:
S-131 (NORTH MAPLE STREET) – DORCHESTER, SC**

Utility Company	Contact Name & Email	Phone Number
Dominion Energy Distribution	Timothy Ridgell timothy.ridgell@dominionenergy.com	(843) 851-4954
Summerville CPW	Micah Miley mmiley@summervillecpw.com	(843) 412-3734
Dorchester County Water & Sewer	Jason Coffman jcoffman@dorchestercounty.net	(843) 832-0093
Dominion Energy Gas	Jerry Mondo gerald.mondo@dominionenergy.com	(843) 277-4487
AT&T	Kaye Jefferson cj9951@att.com	(843) 745-4424
Spectrum	Patrick Alexander patrick.alexander@charter.com	(843) 214-6676
Segra	Russell Myers russell.myers@segra.com	(803) 315-4487

For informational purposes only, Utility relocation plans are included in the contract construction drawings for this project. These plans are for illustration purposes only so the contractor can visualize the utility relocations. For detailed construction utility relocation plans, the contractor will need to coordinate with the utility owners to obtain copies. It is the responsibility of the Contractor to call SC811 and the non SC811 member utilities three (3) days prior to work so that the existing utilities can be properly marked. All utility relocation work for those who are inside the project limits will be verified and coordinated by the contractor during construction.

These plans are to be used only as reference for utility relocations.

All relocations are approximate based on information provided by the individual utility owners.

All proposed relocations are considered incomplete and the individual utility owners may require additional relocations.

Actual field conditions will dictate the precise location of the relocated utility through coordination between the contractor and the utility owner.

The contractor shall refer to each utility owner's relocation plans individually for detailed and accurate information regarding relocations.

The Contractor is required to contact SC811 as well as non SC811 member utilities three days prior to excavating activities.

The Contractor is required to coordinate the roadway construction schedule with the utility relocation schedules.

UTILITY AS-BUILTS:

The roadway contractor shall be responsible for the collection and incorporation of the utility as-builts in their final submittal. All existing, proposed, and abandon lines must be shown.

UTILITY STAKING:

Contractor shall be aware on as needed basis; utilities may request staking of construction items and rights-of-way to help facilitate relocations and to avoid potential conflict with roadway construction and other utilities.

UTILITY RELOCATION INCIDENTALS:

For the relocation of services, adjustments of valve covers and/or manhole lids, adjustments for point conflicts, and any other utility appurtenances adjustments, the contractor shall notify the utility owner five (5) days prior to needing adjust and allow one (1) week to complete.

UTILITY RELOCATION WINDOW & SEQUENCE:

TEMPORARY SUSPENSION FOR UTILITY WORK:

Once the notice to proceed has been established, the Contractor shall begin associated clearing and staking operations on North Maple Street. The Contractor shall be complete with the clearing and grubbing operations no later than March 31, 2023. Upon completion of the clearing and grubbing and construction staking, the Contractor shall notify the Town Engineer by letter. Once the Town Engineer has been notified that clearing and grubbing, erosion control, and staking operations on the road are complete, a specified 180-day utility window shall begin. The Town Engineer shall establish the beginning and end date of the utility windows.

During this utility window, the Contractor will not be allowed to perform any work activities unless approved by the Town Engineer. If work activities are approved, they should in no way hinder or interfere with the utility relocations during the utility window provided. If work activities interfere with utility relocations, all work by the prime contractor and subcontractors will be suspended until the end of the utility window.

The Contractor shall be responsible for maintaining all erosion control measures on the project. The Town will not compensate the Contractor for any additional mobilization other than the bid amount for mobilization.

This provision in no way provides a guarantee that all utility relocations will be completed during the utility window.

UTILITY RELOCATION SEQUENCE:

It is the intention of the utilities to relocate according to the following construction sequence. If the contractor plans to deviate from the proposed phasing, then it is the responsibility of the contractor to coordinate any changes and account for any potential delays.

Step 1: DCW&S, Summerville CPW and Dominion Distribution to relocate early where possible on the south side of the project from Parsons Street to US-78. Relocation work along US-78 can proceed early in the project as well. Dominion Energy will place power lines underground along North Maple. Charter-Spectrum will be installed within the Dominion Energy easement in a joint use duct bank. This Dominion Energy underground work may proceed as soon as easements are secured, and agreements are in place.

Step 2: Dominion Energy Gas to be relocated between water and right-of-way after the water relocation is complete on the south side of the project from Parsons Street to US-78. Dominion Energy Gas has informed that demolition at tract 11 will need to be completed prior to gas relocation in that area. Charter-Spectrum relocation will follow behind the Dominion Energy Distribution pole relocations along Parsons Street and along Richardson.

Step 3: DCW&S, Summerville CPW and Dominion Distribution, AT&T Charter-Spectrum and Segra to relocate north of US-78 after the razing of buildings within right-of-way is complete and after clearing and grubbing is completed.

Step 4: Dominion Energy Gas to be relocated between water and right-of-way after the water relocation is complete on the north side of the project from US-78 to project limits at Sta. 128+70. Charter-Spectrum relocation will follow behind the Dominion Energy Distribution pole relocations where not converting to underground in JUDB.

Step 5: Charter-Spectrum relocation will follow behind the Dominion Energy Distribution pole relocations along US-78. Segra to relocate along US-78 and North Maple after Dominion Energy is in place at the US-78 / North Maple intersection since Segra will be in the joint bore at the intersection.

Step 6: Per AT&T, their relocation will not begin prior to the construction project. AT&T will begin their relocation once the project is let.

UTILITY RELOCATION TIMEFRAMES:

Utility Company	Notice Period	Relocation Period
Dominion Energy Distribution	4-weeks	6-months
Summerville CPW	4-weeks	3-months
Dorchester County Water & Sewer	3-months	6-weeks
SCE&G Gas	3-weeks	3-months
AT&T	4-weeks	6-months
Charter-Spectrum	3-weeks	6-months (JUDB with Dominion Energy)
Segra	4-weeks	2-months

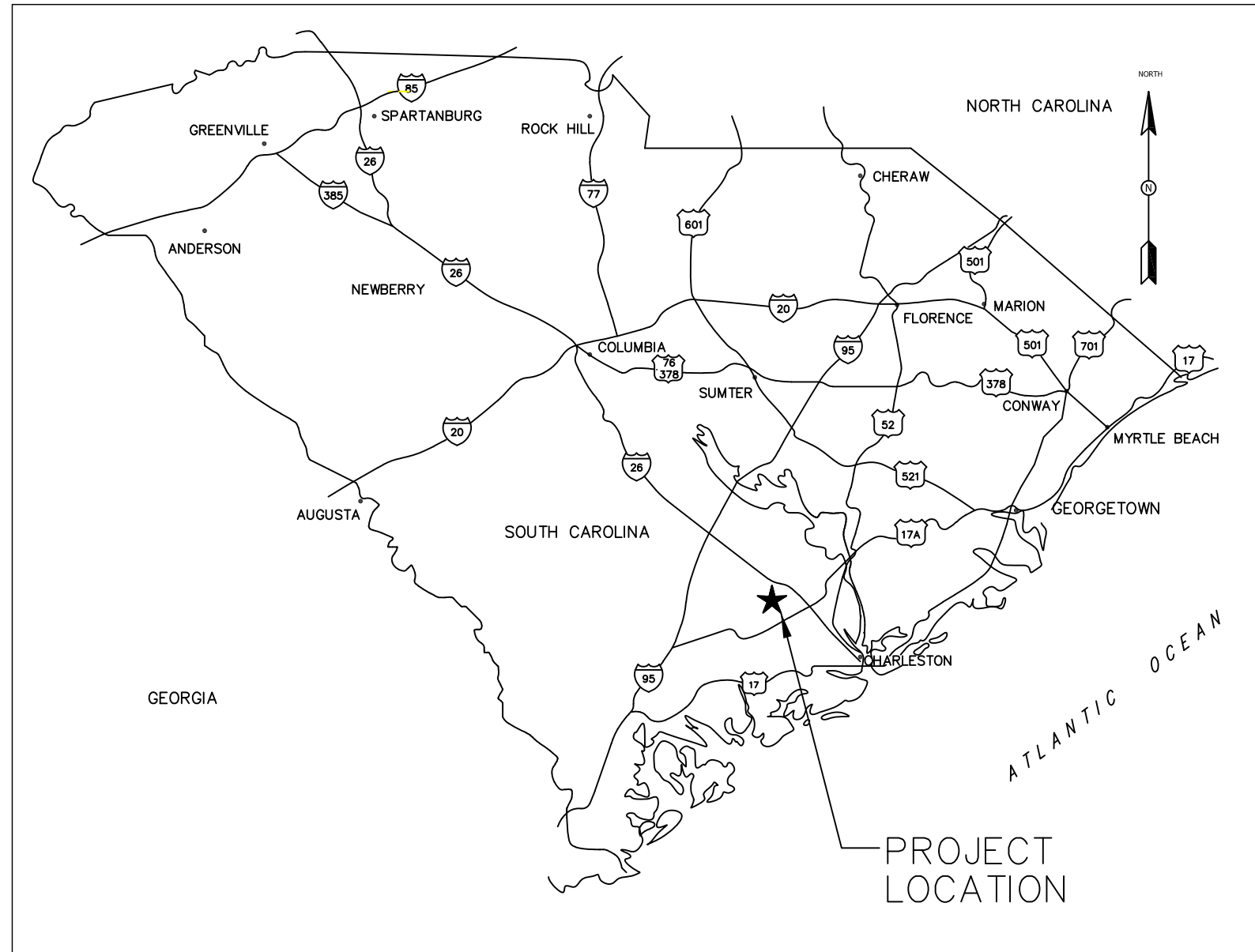
Contractor to confirm time frames and relocation status.

Attachment B – In-contract DCW&S Bid Package / Standard Specifications

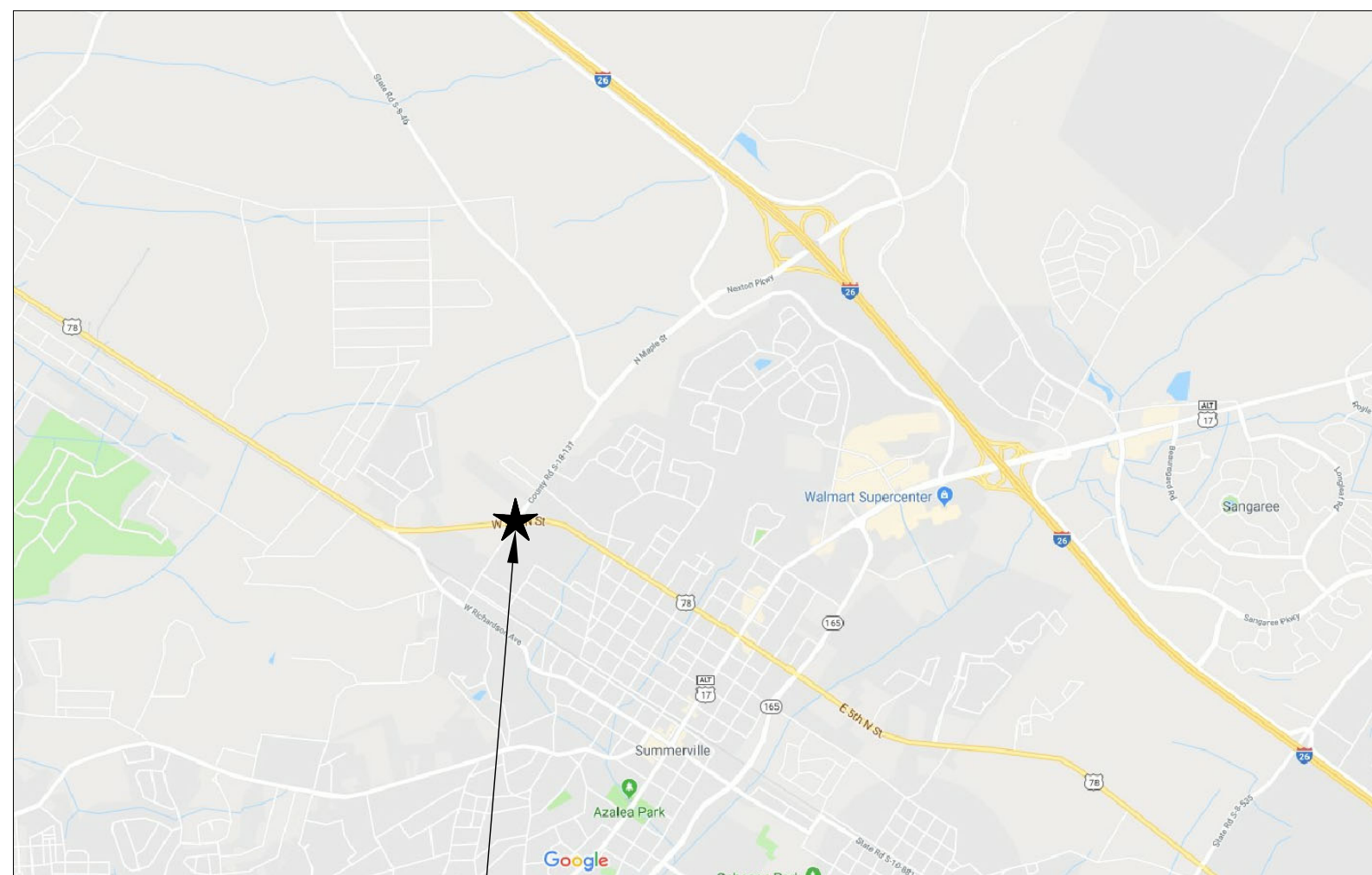
**DORCHESTER COUNTY WATER & SEWER
SIGNED AND SEALED WATER RELOCATION PLANS**

MAPLE STREET FORCE MAIN RELOCATION

DORCHESTER COUNTY WATER & SEWER DEPARTMENT



VICINITY MAP
NTS



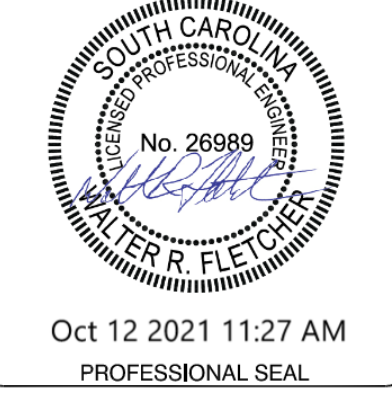
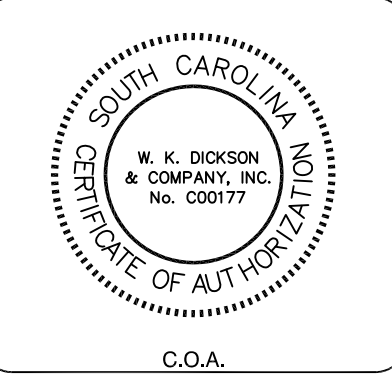
PROJECT MAP
NTS



**DORCHESTER COUNTY
WATER & SEWER DEPARTMENT**
235 DEMING WAY
SUMMERVILLE, SC 29483
PHONE: (843) 832-0061
FAX: (843) 832-0073

Sheet List Table	
Sheet Number	Sheet Title
G-00	COVER
G-01	LEGENDS, ABBREVIATIONS, AND GENERAL NOTES
CE01	SEDIMENT AND EROSION CONTROL DETAILS
CE02	SEDIMENT AND EROSION CONTROL DETAILS
C-01	4IN FORCE MAIN
C-02	4IN FORCE MAIN
C-03	8IN SANTARY SEWER
C-04	8IN SANTARY SEWER
C501	DETAILS
C502	DETAILS
601-110-00	MATERIALS STORAGE PRIMARY & SECONDARY RURAL ROADS
601-115-00	MATERIALS STORAGE PRIMARY & SECONDARY URBAN ROADS
601-205-01	PROTECTION OF EXCAVATIONS ADJACENT TO ROADWAY
610-005-00	FLAGGING OPERATIONS TWO-LANE TWO-WAY PRIMARY & SECONDARY ROUTES
610-005-10	FLAGGING OPERATIONS TWO-LANE TWO-WAY ROADWAYS WITHOUT INTERSECTIONS
610-005-20	FLAGGING OPERATIONS WORK ZONES CONTINUING THROUGH STOP SIGN CONTROLLED SIDE ROADS
610-005-50	FLAGGING OPERATIONS WORK ZONES CONTINUING THROUGH TRAFFIC SIGNAL CONTROLLED INTERSECTION WITH FLAGGERS
610-005-60	FLAGGING OPERATIONS WORK ZONES BEGINNING @ INTERSECTIONS WITH TWO-LANE TWO-WAY ROADWAYS DEPARTURE LANE
610-005-70	FLAGGING OPERATIONS WORK ZONES BEGINNING @ INTERSECTIONS WITH TWO-LANE TWO-WAY ROADWAYS APPROACH LANE
610-015-00	LANE CLOSURE NIGHT TIME URBAN LOW SPEED
610-205-00	RIGHT SHOULDER CLOSURE

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community infrastructure consultants
 162 SEVEN FARMS DRIVE
 SUITE 210
 CHARLESTON, SC 29492
 (843) 416-5560
 (843) 416-5563
 WWW.WKDICKSON.COM



NO.	DATE	DESCRIPTION	BY
A	10/02/19	100% REVIEW SET - NOT FOR CONSTRUCTION	WRF

PROJECT NAME: MAPLE STREET FORCE MAIN RELOCATION FOR DORCHESTER COUNTY WATER AND SEWER DEPARTMENT
 DRAWING TITLE: COVER

PROJ. MGR.: WRF
 DESIGN BY: WRF
 DRAWN BY: CBB
 PROJ. DATE: 10-12-2018
 DRAWING NUMBER: **G-00**
 WKD PROJ. NO.: 20180371.00.CH

NOTICE TO CONTRACTOR

- PRIOR TO CONSTRUCTION, DIGGING, OR EXCAVATION THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES (PUBLIC OR PRIVATE) THAT MAY EXIST AND CROSS THROUGH THE AREA(S) OF CONSTRUCTION, WHETHER INDICATED ON THE PLANS OR NOT. CALL "811" A MINIMUM OF 72 HOURS PRIOR TO DIGGING OR EXCAVATING. REPAIRS TO ANY UTILITY DAMAGED RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.



ISSUED FOR PERMITTING - NOT FOR CONSTRUCTION

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CONTRACT NO. 20180371.00. CH. ALL RIGHTS RESERVED. REVISIONS SHALL BE MADE AS NECESSARY BY THE ENGINEER. ANY CHANGES TO THE ORIGINAL DRAWING SHALL BE INDICATED BY A REVISION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL DIMENSIONS AND DEPTHS PRIOR TO ORDERING MATERIALS AND STARTING CONSTRUCTION. NOTIFY THE ENGINEER IF FIELD MEASUREMENTS OR SIZES DIFFER SIGNIFICANTLY FROM DRAWINGS.

FILE PATH: Z:\Projects\Environmental\Documents\County\Water\20180371.00.CH\Maple_Street_Force_Main_Reloocation\CD07\Plan_Sheet\011001.DWG

EXISTING LEGEND

	POWER POLE
	SEWER MANHOLE
	STORM DRAINAGE LINE
	SANITARY SEWER LINE
	SANITARY SEWER LINE (ABANDONED IN PLACE)
	FORCE MAIN
	FORCE MAIN (ABANDONED IN PLACE)
	WATER METER
	WATER VALVE
	FIRE HYDRANT
	TELE. PED.
	GAS VALVE
	FENCE
	TREE LINE
	CLEAN OUT
	OVERHEAD WIRE
	GAS LINE
	COMMUNICATION LINE
	WATER MAIN
	WATER MAIN (ABANDONED IN PLACE)
	PROPERTY LINE
	SCDOT RIGHT-OF-WAY
	WETLANDS
	CURB BASIN
	DROP INLET

IMPROVEMENTS LEGEND

	AIR RELEASE VALVE
	SEWER MANHOLE
	ATT PROPOSED (INSTALLED BY OTHERS)
	FORCE MAIN
	SC&G (GAS) (INSTALLED BY OTHERS)
	SC&G (OVERHEAD WIRES) (INSTALLED BY OTHERS)
	SANITARY SEWER LINE
	STORM DRAIN LINE (INSTALLED BY OTHERS)
	SUMMERVILLE CPW (INSTALLED BY OTHERS)
	SILT FENCE
	PAVEMENT CUT
	CLEAN OUT
	TREE TO BE REMOVED

CIVIL ABBREVIATIONS

BFV	BUTTERFLY VALVE
CM	CREPE MYRTLE
CMF	CONCRETE MONUMENT FOUND
CO	CLEAN-OUT
DW	DOG WOOD
GV	GAS VALVE
HDD	HORIZONTAL DIRECTIONAL DRILL
IPF	IRON PIN FOUND
LO	LIVE OAK
LP	LIGHT POLE
MAG	MAGNOLIA
MV	VALVE MARKER
PAL	PALM
PP	POWER POLE
S&EC	SEDIMENTATION AND EROSION CONTROL
SHB	SHRUB
SGN	SIGN
TE	TELEPHONE POLE
TS&V	TAPPING SLEEVE AND VALVE
TUP	TUPOLO
WM	WATER METER
WO	WATER OAK
WV	WATER VALVE

PROCESS ABBREVIATIONS

BV	BALL VALVE
CE	CONSTRUCTION ENT./EXIT
CL	CHLORINE
CS	CHEMICAL SYSTEM
CV	CHECK VALVE
DCNT	DECANT
D / DR	DRAIN
EFF	EFFLUENT
FCA	FLANGE COUPLING ADAPTOR
FCP	FACTORY CONTROL PANEL
FM	FORCE MAIN
GV	GATE VALVE
INF	INFLUENT
NPW	NON-POTABLE WATER
OF	OVERFLOW
P	PUMP
PD	PROCESS DRAIN
PA	PROCESS AIR
V	VENT
W	WATER
WW	WASH WATER

MATERIALS OF CONSTRUCTION

AC	ASBESTOS CEMENT
BS	BLACK STEEL
CISP	CAST IRON SOIL PIPE
DIP	DUCTILE IRON PIPE
FPVC	FUSIBLE POLYVINYL CHLORIDE
FRP	FIBERGLASS REINFORCED PLASTIC
GSP	GALVANIZED STEEL
PE	POLYETHYLENE
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
SSTL OR S.S.	STAINLESS STEEL
STL	STEEL

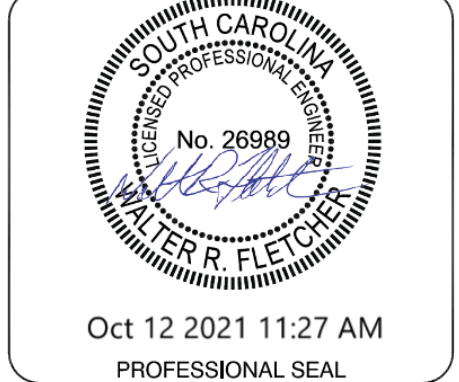
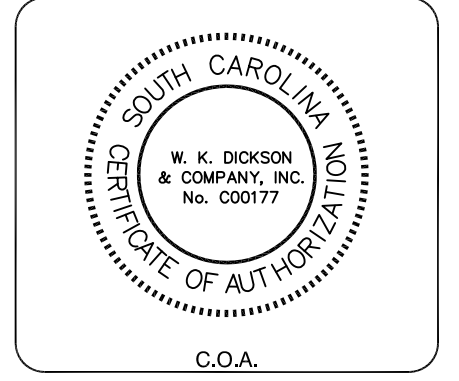
GENERAL CONSTRUCTION NOTES:

1. THE BASE MAP, PROPERTY LINE, EXISTING CONDITIONS, & TOPOGRAPHY WERE TAKEN FROM CONSTRUCTION DRAWINGS PROVIDED BY THE ROADWAY DESIGN ENGINEER. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, PIPE SIZES AND DEPTHS PRIOR TO ORDERING MATERIALS AND STARTING CONSTRUCTION. NOTIFY THE ENGINEER IF FIELD MEASUREMENTS OR SIZES DIFFER SIGNIFICANTLY FROM DRAWINGS.
2. THE ENGINEER HAS MADE ALL POSSIBLE ATTEMPTS TO LOCATE EXISTING UTILITIES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD-VERIFY THE LOCATIONS OF ALL UTILITIES PRIOR TO CONSTRUCTION AND TO NOTE ANY CONFLICTS. ANY DAMAGE TO UTILITIES INCURRED DURING CONSTRUCTION IS THE RESPONSIBILITY OF THE CONTRACTOR AND IS TO BE REPAIRED AT THE CONTRACTOR'S EXPENSE. P.U.P.S. TELEPHONE NUMBER IS 1-888-721-7877.
3. MINIMUM SEPARATION DISTANCES BETWEEN WATER AND SEWER LINES:
 - A. WATER OVER SANITARY SEWER - 18" VERTICAL OR 10' HORIZONTAL
 - B. STORM SEWER - 30" VERTICAL
4. D.I.P. WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS MAY BE SUBSTITUTED WHERE SEPARATION DISTANCES BETWEEN THE SANITARY SEWER AND STORM SEWERS OR WATER LINES CANNOT BE MAINTAINED. PIPE MUST BE LAID SUCH THAT FULL SECTIONS OF PIPE ARE CENTERED ON THE CROSSING AND EXTEND A DISTANCE OF 10' ON EACH SIDE OF THE POINT OF CROSSING.
5. CONTRACTOR SHALL USE STEEL PLATES, STEEL PLATE AHEAD SIGNS, AND SECURE PLATE LOCKS AT ALL PAVEMENT CUTS IN ACCORDANCE WITH SCDOT STANDARDS.

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REVISION RECORD

NO.	DATE	DESCRIPTION	BY
A	10/02/19	100% REVIEW SET - NOT FOR CONSTRUCTION	WRF

PROJECT NAME: MAPLE STREET FORCE MAIN RELOCATION FOR DORCHESTER COUNTY WATER AND SEWER DEPARTMENT

DRAWING TITLE: LEGENDS, ABBREVIATIONS, AND GENERAL NOTES

PROJ. MGR.: WRF
 DESIGN BY: WRF
 DRAWN BY: CBB
 PROJ. DATE: 10-12-2018
 DRAWING NUMBER:

G-01
 WKD PROJ. NO.: 20180371.00.CH

ISSUED FOR PERMITTING - NOT FOR CONSTRUCTION

CONSULTANT: W.K. DICKSON, INC. PROJECT: PERMITTING - NOT FOR CONSTRUCTION. DRAWING TITLE: SEDIMENT AND EROSION CONTROL DETAILS. DATE: 10/12/2018. DRAWING NO.: 20180371.00.CH.

TEMPORARY SEEDING

The purpose of temporary seeding is to reduce erosion and sedimentation by stabilizing disturbed areas that would otherwise lay bare for long periods of time before they are worked or stabilized. Temporary seeding is also used where permanent vegetation growth is not necessary or appropriate.

When and Where to Use It

Temporary seeding is used on exposed soil surfaces such as denuded areas, soil stockpiles, dikes, dams, banks of sediment basins, banks of sediment traps, and temporary road banks. Temporary seeding prevents and limits costly maintenance operations on other sediment control structures. Sediment cleanout requirements for sediment basins, sediment traps, and silt fence is reduced if the drainage area is seeded when grading and construction operation are not taking place. Temporary stabilization is required within 14 days after construction activity is complete unless construction activity is going to resume within 21 days. Cover seeded areas with an appropriate mulch to provide protection from the weather. When the temporary vegetation does not grow quickly or thick enough to prevent erosion, re-seed as soon as possible. Keep seeded areas adequately moist. 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. Runoff of irrigation water wastes water and can cause erosion.

Seed Selection

Seed selection is based on geographical location, soil type, and the season of the year in which the planting is to be done. Use the Table 1 as a guide for conventional tillage methods (plowing, seedbed preparation, hydroseeding, etc). If a fast growing crop to nurse the permanent specie or species is required, then use the mix rate. Failure to carefully follow agronomic recommendations results in an inadequate stand of temporary vegetation that provides little or no erosion control.

Installation

- 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 leaving a textured surface. Disk the soil for optimal germination when the soil is compacted less than 6-inches.
- Soil Testing** - Soil testing is available through Clemson University Cooperative Extension Service.
- Lime** - Lime is not required for temporary seeding unless a soil test shows that the soil pH is below 5.0. It may be desirable to apply lime during the temporary seeding operation to benefit the long-term permanent seeding. Apply a minimum of 1.5 tons of Lime/acre (70 pounds per 1000 square feet) if it is to be used.
- Fertilizer** - Apply a minimum of 500 pounds per acre of 10-10-10 fertilizer (11.5 pounds per 1000 square feet) or equivalent during temporary seeding unless a soil test indicates a different requirement. Incorporate fertilizer and lime (if used) into the top 4-6 inches of the soil by disking or other means where conditions allow.
- Seeding** - Loosen the soil surface before broadcasting the seed. Apply seed evenly by the most convenient method available for the type of seed used and the location of the temporary seeding. 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, and then lightly firm the area with a roller or cultipacker.
- Mulching** - Use mulch with temporary seed applications to retain soil moisture and reduce erosion during the establishment of vegetation. Typical mulch applications include straw, wood fiber, hydromulches, BFM and FGM. Use hydromulches with a minimum blend of 70% wood fibers. The most commonly accepted mulch used in conjunction with temporary 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 emulsions to prevent it from being blown or washed away. Apply the straw mulch by hand or machine at the rate 1.5-2 tons per acre (90 pounds per 1000 square feet). Frequent inspections are necessary to check that conditions for growth are good.
- Irrigation** - Seeded areas should be kept adequately moist. 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. Runoff of irrigation water wastes water and can cause erosion.
- Re-seeding** - Re-seed areas where seeding does not grow quickly, thick enough, or adequately to prevent erosion. Base seed selection on the requirements of local conditions.

Inspection and Maintenance

- Inspect every 7 calendar days and within 24-hours after each rainfall event that produces ½-inches or more of precipitation.
- Cover seeded area with mulch to provide protection. Frequent inspections are necessary to check that conditions for growth are good.
- Supply temporary seeding with adequate moisture. Supply water as needed, especially in abnormally hot or dry weather or on adverse sites. Control water application rates to prevent runoff.

TABLE 1

Species	Lbs/Ac	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temporary Seeding – Coastal													
Sandy, Droughty Sites													
Browntop Millet	40 lbs./ac.												
Rye, Grain	56 lbs./ac.												
Ryegrass	50 lbs./ac.												
Well drained, clayey/loamey Sites													
Browntop Millet or Japanese Millet	40 lbs./ac.												
Rye, Grain or Oats	56 lbs./ac. 75 lbs./ac.												
Ryegrass	50 lbs./ac.												

TABLE 2

Species	Lbs/Ac	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Permanent Seeding - Coastal													
Sandy, Droughty Sites													
Browntop Millet	10 lbs./ac.												
Bahiagrass	40 lbs./ac.												
Browntop Millet	10 lbs./ac.												
Bahiagrass	30 lbs./ac.												
Sericea Lespedeza	40 lbs./ac.												
Browntop Millet	10 lbs./ac.												
Atlantic Coastal Panicgrass	15 lbs./ac. PLS												
Browntop Millet	10 lbs./ac.												
Switchgrass (Alamo)	8 lbs./ac. PLS												
Little Bluestem	4 lbs./ac.												
Sericea Lespedeza	20 lbs./ac.												
Browntop Millet	10 lbs./ac.												
Weeping Lovegrass	8 lbs./ac.												
Well drained, clayey/loamey Sites													
Browntop Millet	10 lbs./ac.												
Bahiagrass	40 lbs./ac.												
Rye, Grain	10 lbs./ac.												
Bahiagrass	40 lbs./ac.												
Clover, Crimson (Annual)	5 lbs./ac.												
Browntop Millet	10 lbs./ac.												
Bahiagrass	30 lbs./ac.												
Sericea lespedeza	40 lbs./ac.												
Browntop Millet	10 lbs./ac.												
Bermuda, Common	10 lbs./ac.												
Sericea lespedeza	40 lbs./ac.												
Browntop Millet	10 lbs./ac.												
Bermuda, Common	12 lbs./ac.												
Kobe Lespedeza (Annual)	10 lbs./ac.												
Browntop Millet	10 lbs./ac.												
Bahiagrass	20 lbs./ac.												
Bermuda, Common	6 lbs./ac.												
Sericea lespedeza	40 lbs./ac.												
Browntop Millet	10 lbs./ac.												
Switchgrass	8 lbs./ac.												
Little Bluestem	PLS												
Indiangrass	3 lbs./ac. PLS 3 lbs./ac. PLS												

PERMANENT SEEDING

Controlling runoff and preventing erosion by establishing a perennial vegetative cover with seed.

When and Where to Use It

A major consideration in the selection of the type of permanent grass to establish is the intended use of the land. Land use is separated into two categories, high-maintenance and low-maintenance.

High-maintenance - High maintenance areas are mowed frequently, lime or fertilized on a regular basis, and require maintenance to an aesthetic standard. Land uses with high maintenance grasses include homes, industrial parks, schools, churches, and recreational areas such as parks, athletic fields, and golf courses.

Low-maintenance - Low maintenance areas are mowed infrequently, if at all, and lime and fertilizer may not be applied on a regular schedule. These areas are not subject to intense use and do not require a uniform appearance. The vegetation must be able to survive with little maintenance over long periods of time. Grass and legume mixtures are favored over long periods of time. Grass and legume mixtures are favored in these areas because legumes are capable of fixing nitrogen in the soil for their own use and the use of grasses around them. Land uses requiring low-maintenance grasses include steep slopes, stream and channel banks, road banks, and commercial and industrial areas with limited access.

Seed Selection

The use of native species is preferred when selecting vegetation. Base plant seed selection on geographical location, 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. Failure to carefully follow agronomic recommendations results in an inadequate stand of permanent vegetation that provides little or no erosion control. Use the Table 2 as a guide for seed selection.

Installation

- Topsoil** - Apply topsoil if the surface soil of the seedbed is not adequate for plant growth.
- Tillage** - If the area has been recently plowed, no tillage is required other than raking the surface or surface roughening to break any crust that has formed leaving a textured surface. Disk the soil for optimal germination when the soil is compacted less than 6-inches. If the soil is compacted more than 6-inches, sub-soiled and disk the area.
- Soil Testing** - Soil testing is available through Clemson University Cooperative Extension Service.
- Lime** - Unless a specific soil test indicates otherwise, apply 1 1/2 tons of ground course textured agricultural limestone per acre (70 pounds per 1000 square feet).
- Fertilizer** - Apply a minimum of 1000 pounds per acre of a complete 10-10-10 fertilizer (23 pounds per 1000 square feet) or equivalent during permanent seeding of grasses unless a soil test indicates a different requirement. Incorporate fertilizer and lime (if used) 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** - Loosen the surface of the soil just before broadcasting the seed. Evenly apply seed by the most convenient method available for the type of seed applied and the location of the seeding. 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, then lightly firm the area with a roller or cultipacker. Do not roll seed that is applied with a hydro-seeder and hydro-mulch.
- Mulching** - Cover all permanent seeded areas with mulch immediately upon completion of the seeding application to retain soil moisture and reduce erosion during establishment of vegetation. Apply the mulch evenly in such a manner that it provides a minimum of 75% coverage. Typical mulch applications include straw, wood fiber, hydromulches, BFM and FGM. Use hydromulches with a minimum blend of 70% wood fibers. The most commonly accepted mulch used in conjunction with permanent seeding is small grain straw. Select straw that is 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. Apply straw mulch by hand or machine at the rate of 2 tons per acre (90 pounds per 1000 square feet). Frequent inspections are necessary to check that conditions for growth are good.
- Irrigation** - Keep permanent seeded areas 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. Runoff of irrigation water wastes water and can cause erosion.
- 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 patch, re-evaluate the choice of grass and quantities of lime and fertilizer applied. Final stabilization by permanent seeding of the site requires that it be covered by 70% coverage rate.

Inspection and Maintenance

- Inspect seeded areas for failure and make necessary repairs and re-seed immediately. Conduct a follow-up survey after one year and replace failed plants where necessary.
- If vegetative cover is inadequate to prevent rill erosion, overseed and fertilize in accordance with soil test results.



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NO.	DATE	DESCRIPTION	BY

ISSUED FOR PERMITTING - NOT FOR CONSTRUCTION

PROJECT NAME:	MAPLE STREET FORCE MAIN RELOCATION FOR DORCHESTER COUNTY WATER AND SEWER DEPARTMENT
DRAWING TITLE:	SEDIMENT AND EROSION CONTROL DETAILS

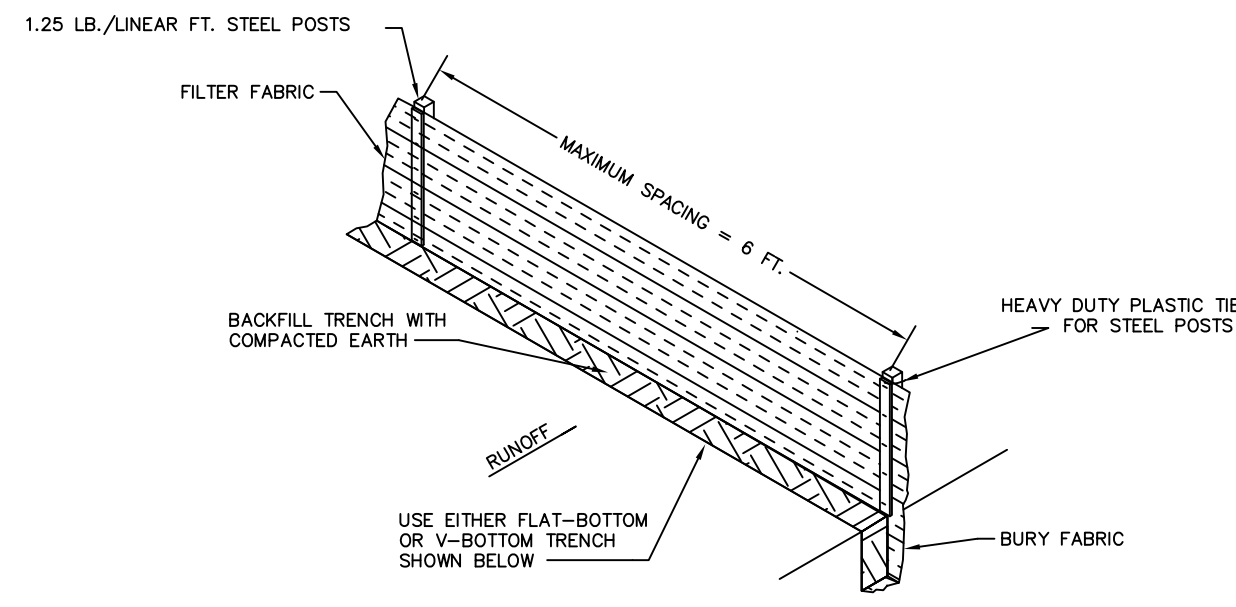
PROJ. MGR.:	WRF
DESIGN BY:	WRF
DRAWN BY:	CBB
PROJ. DATE:	10-12-2018
DRAWING NUMBER:	

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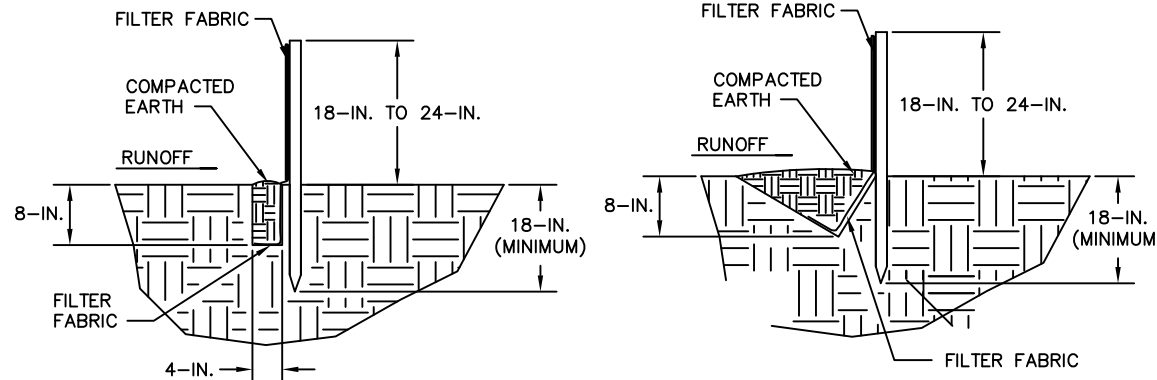
WKD PROJ. NO.:

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CONTRACTOR SHALL MAINTAIN ACCESS TO ALL UTILITIES AND SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE UTILITIES. ANY DAMAGE TO UTILITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE UTILITIES. ANY DAMAGE TO UTILITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.



SILT FENCE INSTALLATION



FLAT-BOTTOM TRENCH DETAIL V-SHAPED TRENCH DETAIL

When and Where to Use It

Silt fence is applicable in areas: Where the maximum sheet or overland flow path length to the fence is 100-feet. Where the maximum slope steepness (normal [perpendicular] to fence line) is 2H:1V. That do not receive concentrated flows greater than 0.5 cfs. Do not place silt fence across channels or use it as a velocity control BMP.

Materials

Steel Posts
Use 48-inch long steel posts that meet the following minimum physical requirements: Composed of high strength steel with minimum yield strength of 50,000 psi. Have a standard "T" section with a nominal face width of 1.38-inches and nominal "T" length of 1.48-inches. Weigh 1.25 pounds per foot (± 8%). Have a soil stabilization plate with a minimum cross section area of 17-square inches attached to the steel posts. Painted with a water based baked enamel paint.

Use steel posts with a minimum length of 4-feet, weighing 1.25 pounds per linear foot (± 8%) with projections to aid in fastening the fabric. Except when heavy clay soils are present on site, steel posts will have a metal soil stabilization plate welded near the bottom such that when the post is driven to the proper depth, the plate will be below the ground level for added stability. The soil plates should have the following characteristics:

- Be composed of minimum 15 gauge steel.
- Have a minimum cross section area of 17-square inches.

Geotextile Filter Fabric

Filter fabric is: Composed of fibers consisting of long chain synthetic polymers composed of at least 85% by weight of polyolefins, polyesters, or polyamides. Formed into a network such that the filaments or yarns retain dimensional stability relative to each other. Free of any treatment or coating which might adversely alter its physical properties after installation. Free of defects or flaws that significantly affect its physical and/or filtering properties. Cut to a minimum width of 36 inches. Use only fabric appearing on SCDOT Approval Sheet #34 meeting the requirements of the most current edition of the SCDOT Standard Specifications for Highway Construction.

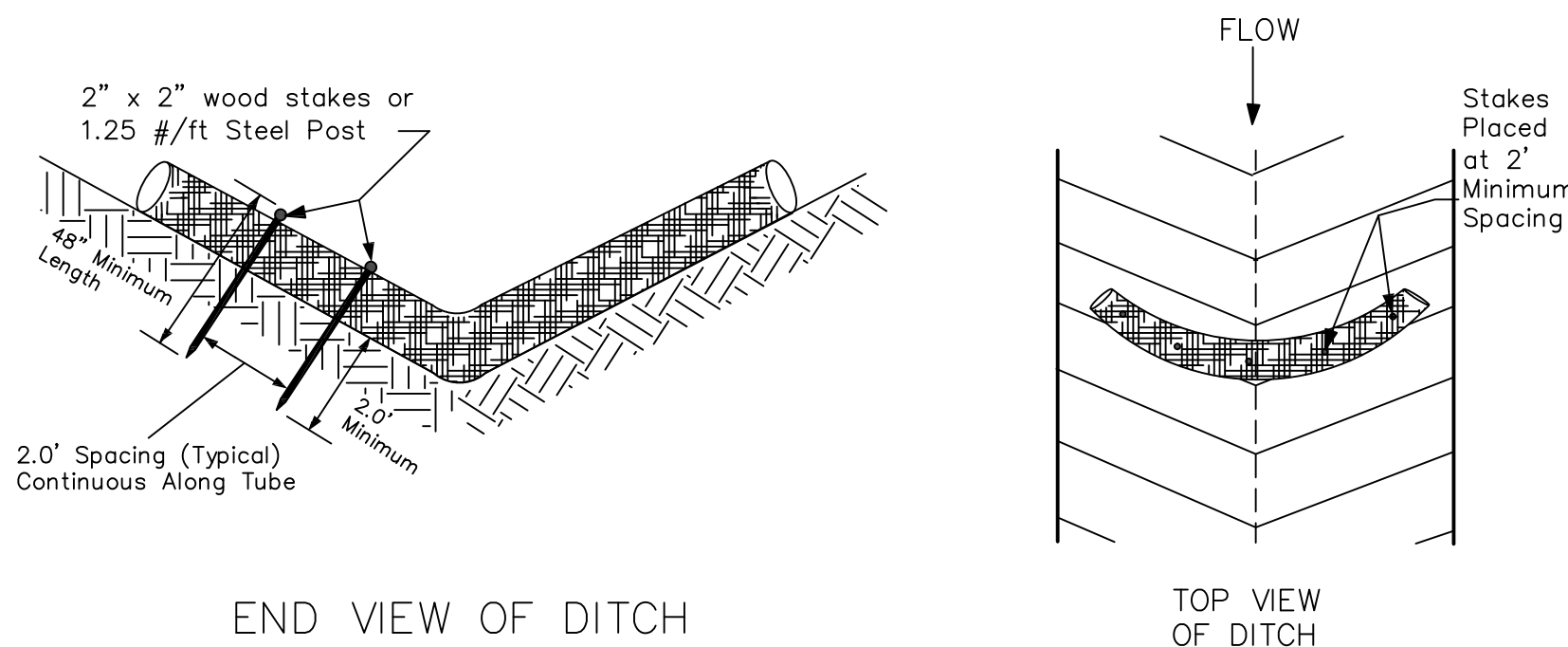
Installation

Excavate a trench approximately 6-inches wide and 6-inches deep when placing fabric by hand. Place 12-inches of geotextile fabric into the 6-inch deep trench, extending the remaining 6-inches towards the upslope side of the trench. Backfill the trench with soil or gravel and compact. Bury 12-inches of fabric into the ground when pneumatically installing silt fence with a slicing method. Purchase fabric in continuous rolls and cut to the length of the barrier to avoid joints. When joints are necessary, wrap the fabric together at a support post with both ends fastened to the post, with a 6-inch minimum overlap. Install posts to a minimum depth of 24-inches. Install posts a minimum of 1- to 2- inches above the fabric, with no more than 3-feet of the post above the ground. Space posts to maximum 6-foot centers. Attach fabric to wood posts using staples made of heavy-duty wire at least 1½-inch long, spaced a maximum of 6-inches apart. Staple a 2-inch wide lathe over the filter fabric to securely fasten it to the upslope side of wooden posts. Attach fabric to the steel posts using heavy-duty plastic ties that are evenly spaced and placed in a manner to prevent sagging or tearing of the fabric. In all cases, ties should be affixed in no less than 4 places. Install the fabric a minimum of 24-inches above the ground. When necessary, the height of the fence above ground may be greater than 24-inches. In tidal areas, extra silt fence height may be required. The post height will be twice the exposed post height. Post spacing will remain the same and extra height fabric will be 4-, 5-, or 6-foot tall. Locate silt fence checks every 100 feet maximum and at low points. Install the fence perpendicular to the direction of flow and place the fence the proper distance from the toe of steep slopes to provide sediment storage and access for maintenance and cleanup.

Inspection and Maintenance

Inspect every seven calendar days and within 24-hours after each rainfall event that produces ½-inch or more of precipitation. Check for sediment buildup and fence integrity. Check where runoff has eroded a channel beneath the fence, or where the fence has sagged or collapsed by fence overtopping. If the fence fabric tears, begins to decompose, or in any way becomes ineffective, replace the section of fence immediately. Remove sediment accumulated along the fence when it reaches 1/3 the height of the fence, especially if heavy rains are expected. Remove trapped sediment from the site or stabilize it on site. Remove silt fence within 30 days after final stabilization is achieved or after temporary best management practices (BMPs) are no longer needed. Permanently stabilize disturbed areas resulting from fence removal.

2 SILT FENCE
Scale: NONE



END VIEW OF DITCH

TOP VIEW OF DITCH

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 TUBE

Description
Sediment tubes are elongated tubes of compacted geotextiles, curled excelsior wood, natural coconut fiber or hardwood mulch. Straw, pine needle and leaf mulch-filled sediment tubes are not permitted under this specification.

Materials
Sediment tubes for ditch checks and Type A Inlet Structure Filters exhibit the following properties: Produced by a Manufacturer experienced in sediment tube manufacturing. Composed of compacted geotextiles, curled excelsior wood, natural coconut fibers, hardwood mulch or a mix of these materials enclosed by a flexible netting material. Straw, straw fiber, straw bales, pine needles and leaf mulch are not allowed under this specification. Utilizes outer netting that consists of seamless, high-density polyethylene photodegradable materials treated with ultraviolet stabilizers or a seamless, high-density polyethylene non-degradable materials. Diameter ranging from 18-inches to 24-inches. Curled excelsior wood, or natural coconut rolled erosion control products (RECPs) that are rolled up to create a sediment tube are not allowed under this specification.

Installation
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.

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.

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 ensuring 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.

Construct a trench that is 20% of the tube diameter to install 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.

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.

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.

Inspection and Maintenance

Check dams should be inspected every 7 calendar days and within 24-hours after each storm that produces ½-inch or more of rain to ensure continued effectiveness.

Large debris, trash, and leaves should be removed.

If erosion causes the edges to fall to a height equal to or below the height of the center, repairs should be made immediately.

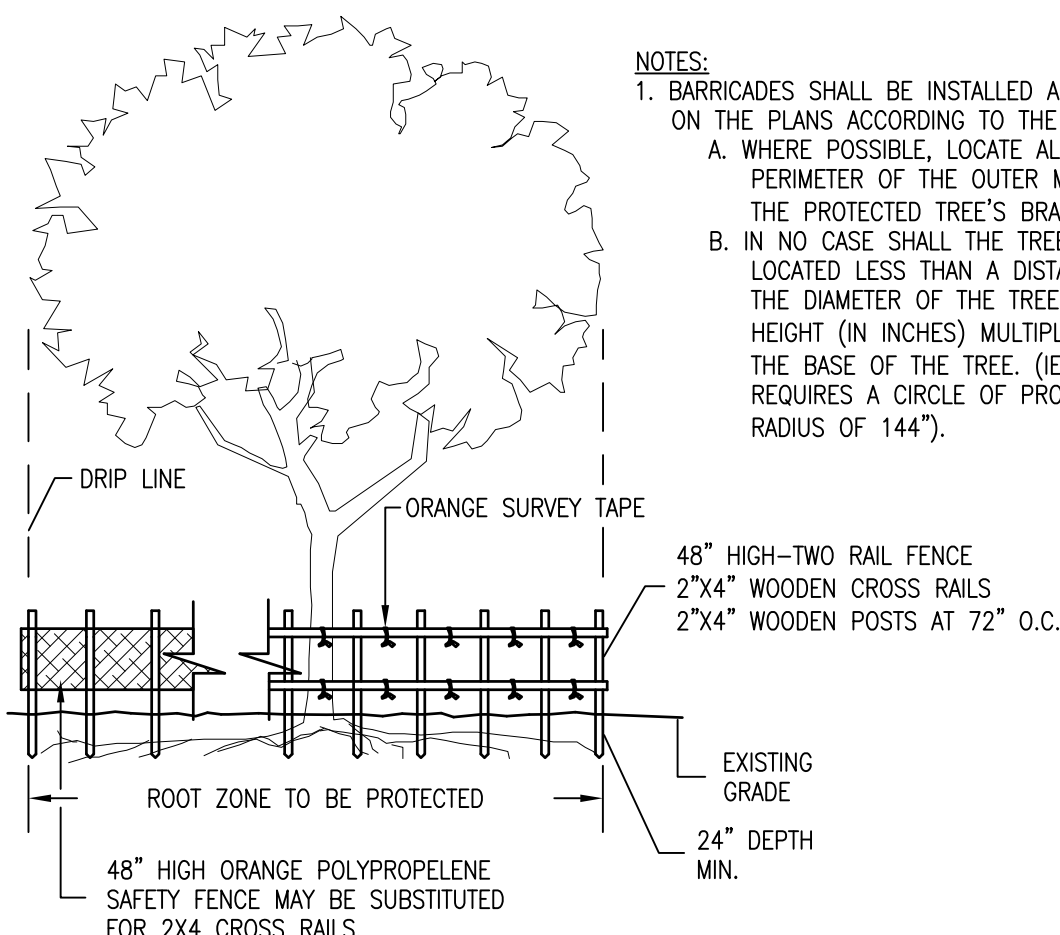
Remove accumulated sediment from the upstream side of the sediment tube when the sediment has reached a height of approximately one-third of the exposed height of the tube (measured at the center).

Accumulated sediment should be removed prior to removing sediment tubes.

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.

1 SEDIMENT TUBE
Scale: NONE

- NOTES:**
- BARRICADES SHALL BE INSTALLED AROUND ALL TREES INDICATED ON THE PLANS ACCORDING TO THE FOLLOWING STANDARDS:
 - WHERE POSSIBLE, LOCATE ALONG THE PERIMETER OF THE OUTER MOST SPREAD OF THE PROTECTED TREE'S BRANCHES (DRIP LINE).
 - IN NO CASE SHALL THE TREE PROTECTION BE LOCATED LESS THAN A DISTANCE EQUAL TO THE DIAMETER OF THE TREE AT BREST HEIGHT (IN INCHES) MULTIPLIED BY 6" FROM THE BASE OF THE TREE. (IE: A 24" TREE REQUIRES A CIRCLE OF PROTECTION WITH A RADIUS OF 144").



3 TREE PROTECTION
Scale: NONE

SEDIMENTATION AND EROSION CONTROL NOTES:

- 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.
- 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. WHERE STABILIZATION BY THE 14TH DAY IS PRECLUDED BY SNOW COVER OR FROZEN GROUND CONDITIONS. STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICABLE. WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED AND EARTH-DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 14 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE.
- ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED ONCE EVERY CALENDAR WEEK. IF PERIODIC INSPECTION OR OTHER INFORMATION INDICATES THAT A BMP HAS BEEN INAPPROPRIATELY OR INCORRECTLY INSTALLED, THE PERMITTEE MUST ADDRESS THE NECESSARY REPLACEMENT OR MODIFICATION REQUIRED TO CORRECT THE BMP WITHIN 48 HOURS OF IDENTIFICATION.
- 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 SEDIMENT BEFORE BEING PUMPED BACK INTO ANY WATERS OF THE STATE.
- ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFFSITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED.
- THE CONTRACTOR MUST TAKE NECESSARY ACTION TO MINIMIZE THE TRACKING OF MUD ONTO PAVED ROADWAY(S) FROM CONSTRUCTION AREAS AND THE GENERATION OF DUST. THE CONTRACTOR SHALL DAILY REMOVE MUD/SOIL FROM PAVEMENT, AS MAY BE REQUIRED.
- 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 SCRI00000.
- 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.
- 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.
- LITTER, CONSTRUCTION DEBRIS, OILS, FUELS, AND BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT, SUCH AS STOCKPILES OF FRESHLY TREATED LUMBER AND CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE IN STORM WATER DISCHARGES.
- A COPY OF THE SWPPP, INSPECTIONS RECORDS, AND RAINFALL DATA MUST BE RETAINED AT THE CONSTRUCTION SITE OR A NEARBY LOCATION EASILY ACCESSIBLE DURING NORMAL BUSINESS HOURS, FROM THE DATE OF COMMENCEMENT OF CONSTRUCTION ACTIVITIES TO THE DATE THAT FINAL STABILIZATION IS REACHED.
- INITIATE STABILIZATION MEASURES ON ANY EXPOSED STEEP SLOPE (3H:1V OR GREATER) WHERE LAND-DISTURBING ACTIVITIES HAVE PERMANENTLY OR TEMPORARILY CEASED, AND WILL NOT RESUME FOR A PERIOD OF 7 CALENDAR DAYS.
- MINIMIZE SOIL COMPACTION AND, UNLESS INFEASIBLE, PRESERVE TOPSOIL.
- MINIMIZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT AND VEHICLE WASHING, WHEEL WASH WATER, AND OTHER WASH WATERS. WASH WATERS MUST BE TREATED IN A SEDIMENT BASIN OR ALTERNATIVE CONTROL THAT PROVIDES EQUIVALENT OR BETTER TREATMENT PRIOR TO DISCHARGE.
- MINIMIZE THE DISCHARGE OF POLLUTANTS FROM DEWATERING OF TRENCHES AND EXCAVATED AREAS. THESE DISCHARGES ARE TO BE ROUTED THROUGH APPROPRIATE BMPS (SEDIMENT BASIN, FILTER BAG, ETC.).
- THE FOLLOWING DISCHARGES FROM SITES ARE PROHIBITED: - WASTEWATER FROM WASHOUT OF CONCRETE, UNLESS MANAGED BY AN APPROPRIATE CONTROL WASTEWATER FROM WASHOUT AND CLEANOUT OF STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS FUELS, OILS, OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE AND SOAPS OR SOLVENTS USED IN VEHICLE AND EQUIPMENT WASHING.
- AFTER CONSTRUCTION ACTIVITIES BEGIN, INSPECTIONS MUST BE CONDUCTED AT A MINIMUM OF AT LEAST ONCE EVERY CALENDAR WEEK AND MUST BE CONDUCTED UNTIL FINAL STABILIZATION IS REACHED ON ALL AREAS OF THE CONSTRUCTION SITE.
- 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 BEFORE THE NEXT STORM EVENT IS IMPRACTICABLE, THE SITUATION MUST BE DOCUMENTED IN THE SWPPP AND ALTERNATIVE BMPS MUST BE IMPLEMENTED AS SOON AS REASONABLY POSSIBLE.
- 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.

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No. 26989
STATE OF SOUTH CAROLINA
OFFICE OF AUTOMATIC LICENSING
WATER RESOURCES ENGINEER
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PROFESSIONAL SEAL

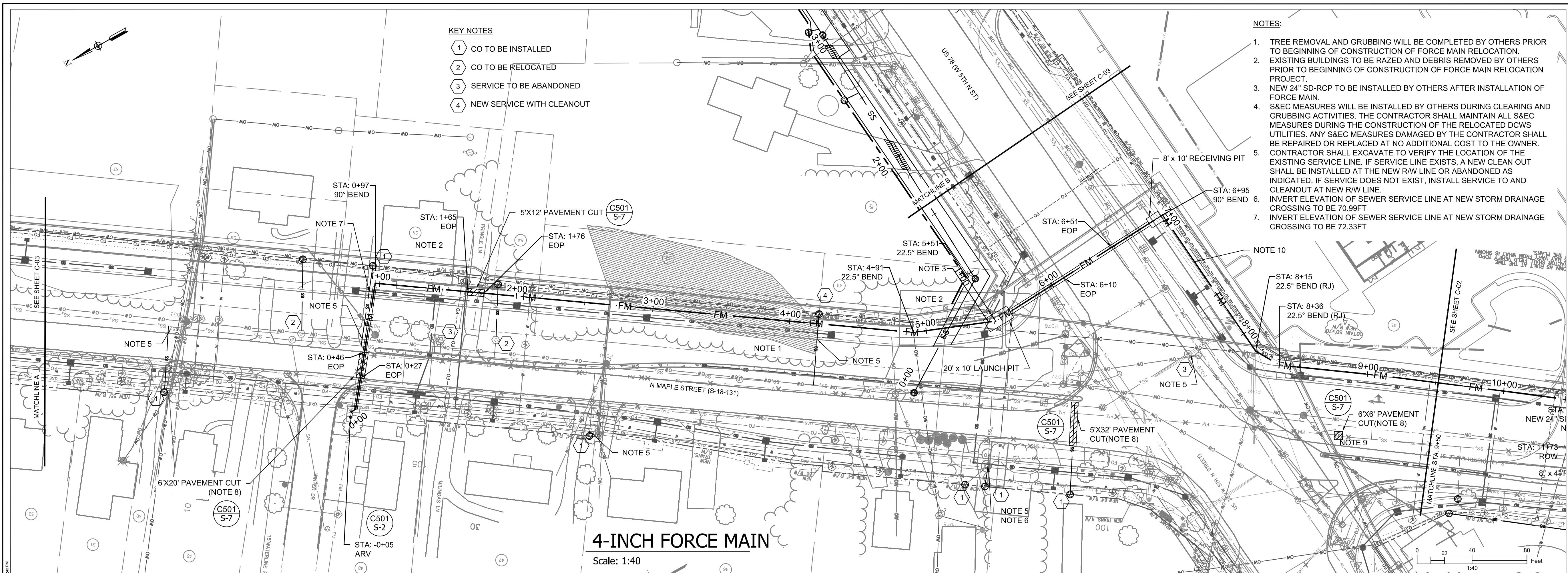
NO.	DATE	DESCRIPTION	BY

PROJECT NAME: MAPLE STREET FORCE MAIN RELOCATION FOR DORCHESTER COUNTY WATER AND SEWER DEPARTMENT

DRAWING TITLE: SEDIMENT AND EROSION CONTROL DETAILS

PROJ. MGR.: WRF
DESIGN BY: WRF
DRAWN BY: CBB
PROJ. DATE: 10-12-2018
DRAWING NUMBER: CE02
WKD PROJ. NO.: 20180371.00.CH

CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES, MANHOLES, AND STRUCTURES PRIOR TO THE START OF CONSTRUCTION. ANY CHANGES TO THE EXISTING UTILITIES OR STRUCTURES SHALL BE NOTED AND APPROVED BY THE DESIGNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL ADJACENT PROPERTIES AND UTILITIES AT ALL TIMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES AND STRUCTURES FROM DAMAGE DURING CONSTRUCTION.

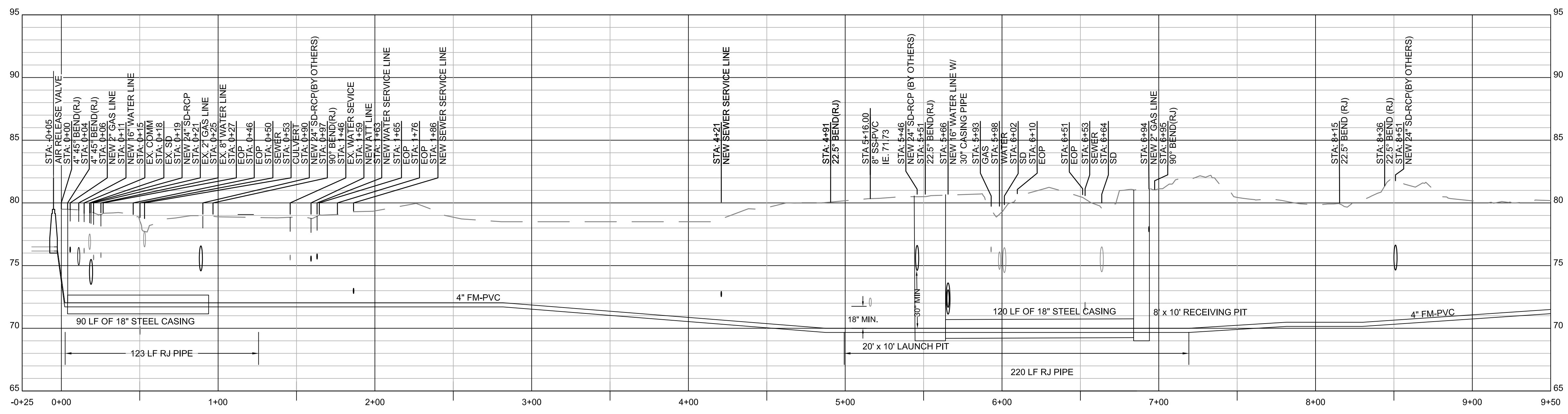


- NOTES:**
- TREE REMOVAL AND GRUBBING WILL BE COMPLETED BY OTHERS PRIOR TO BEGINNING OF CONSTRUCTION OF FORCE MAIN RELOCATION.
 - EXISTING BUILDINGS TO BE RAZED AND DEBRIS REMOVED BY OTHERS PRIOR TO BEGINNING OF CONSTRUCTION OF FORCE MAIN RELOCATION PROJECT.
 - NEW 24" SD-RCP TO BE INSTALLED BY OTHERS AFTER INSTALLATION OF FORCE MAIN.
 - S&EC MEASURES WILL BE INSTALLED BY OTHERS DURING CLEARING AND GRUBBING ACTIVITIES. THE CONTRACTOR SHALL MAINTAIN ALL S&EC MEASURES DURING THE CONSTRUCTION OF THE RELOCATED DOWS UTILITIES. ANY S&EC MEASURES DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL EXCAVATE TO VERIFY THE LOCATION OF THE EXISTING SERVICE LINE. IF SERVICE LINE EXISTS, A NEW CLEAN OUT SHALL BE INSTALLED AT THE NEW R/W LINE OR ABANDONED AS INDICATED. IF SERVICE DOES NOT EXIST, INSTALL SERVICE TO AND CLEANOUT AT NEW R/W LINE.
 - INVERT ELEVATION OF SEWER SERVICE LINE AT NEW STORM DRAINAGE CROSSING TO BE 70.99FT
 - INVERT ELEVATION OF SEWER SERVICE LINE AT NEW STORM DRAINAGE CROSSING TO BE 72.33FT

4-INCH FORCE MAIN
Scale: 1:40

4-INCH FORCE MAIN
H: 1"=40'
V: 1"=5'

- LANE CLOSURES FOR PERFORMING WORK UNDER THE EXISTING PAVEMENT PROHIBITED DURING THE FOLLOWING HOURS:
 MON - FRI 6AM - 9AM
 3PM - 7PM
 SAT 11AM - 7PM
 SUN 11AM - 7PM
- ABANDON EXISTING MANHOLE BY REMOVING RING AND COVER AND CONE SECTIONS WITH SELECT FILL. EXISTING SEWER TO APPROXIMATELY STA. 11+00 SHALL BE ABANDONED IN PLACE BY FILLING WITH FLOWABLE FILL
- THE FORCE MAIN SHALL BE INSTALLED WITH A MINIMUM OF 18 INCHES BETWEEN THE BOTTOM OF THE ADJACENT 12-IN WATER LINE AND THE TOP OF THE FORCE MAIN FROM STA. 6+95 TO STA. 11+33.



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NO.	DATE	DESCRIPTION	BY
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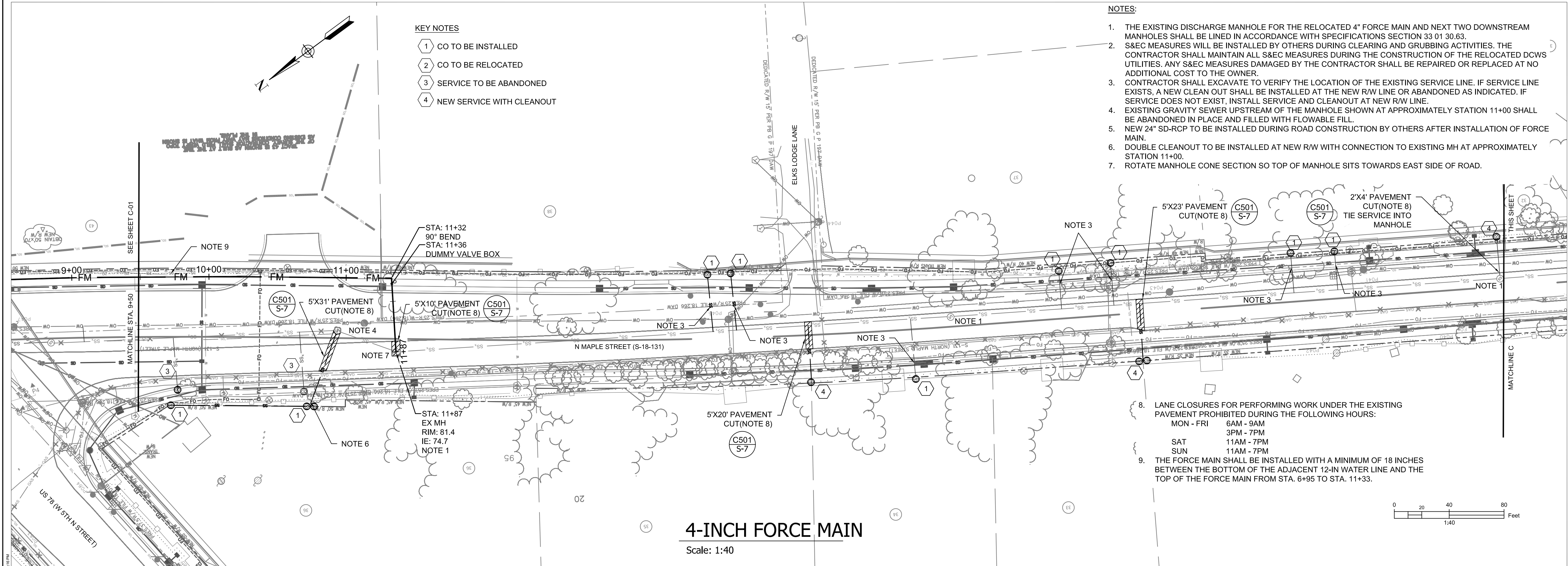
PROJECT NAME: MAPLE STREET FORCE MAIN RELOCATION FOR DORCHESTER COUNTY WATER AND SEWER DEPARTMENT
DRAWING TITLE: 4IN FORCE MAIN STA 0+00 TO 9+50

PROJ. MGR.: WRF
DESIGN BY: WRF
DRAWN BY: OBB
PROJ. DATE: 10-12-2018
DRAWING NUMBER:

C-01
WKD PROJ. NO.: 20180371.00.CH

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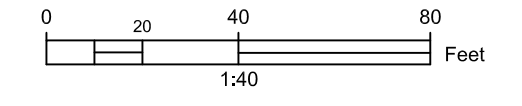
CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND LOCATIONS OF ALL EXISTING UTILITIES AND STRUCTURES PRIOR TO CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED TO THE DESIGNER IMMEDIATELY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE CONTRACTOR SHALL MAINTAIN ALL EXISTING UTILITIES AND STRUCTURES UNLESS OTHERWISE INDICATED ON THIS DRAWING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.



- KEY NOTES**
- 1 CO TO BE INSTALLED
 - 2 CO TO BE RELOCATED
 - 3 SERVICE TO BE ABANDONED
 - 4 NEW SERVICE WITH CLEANOUT

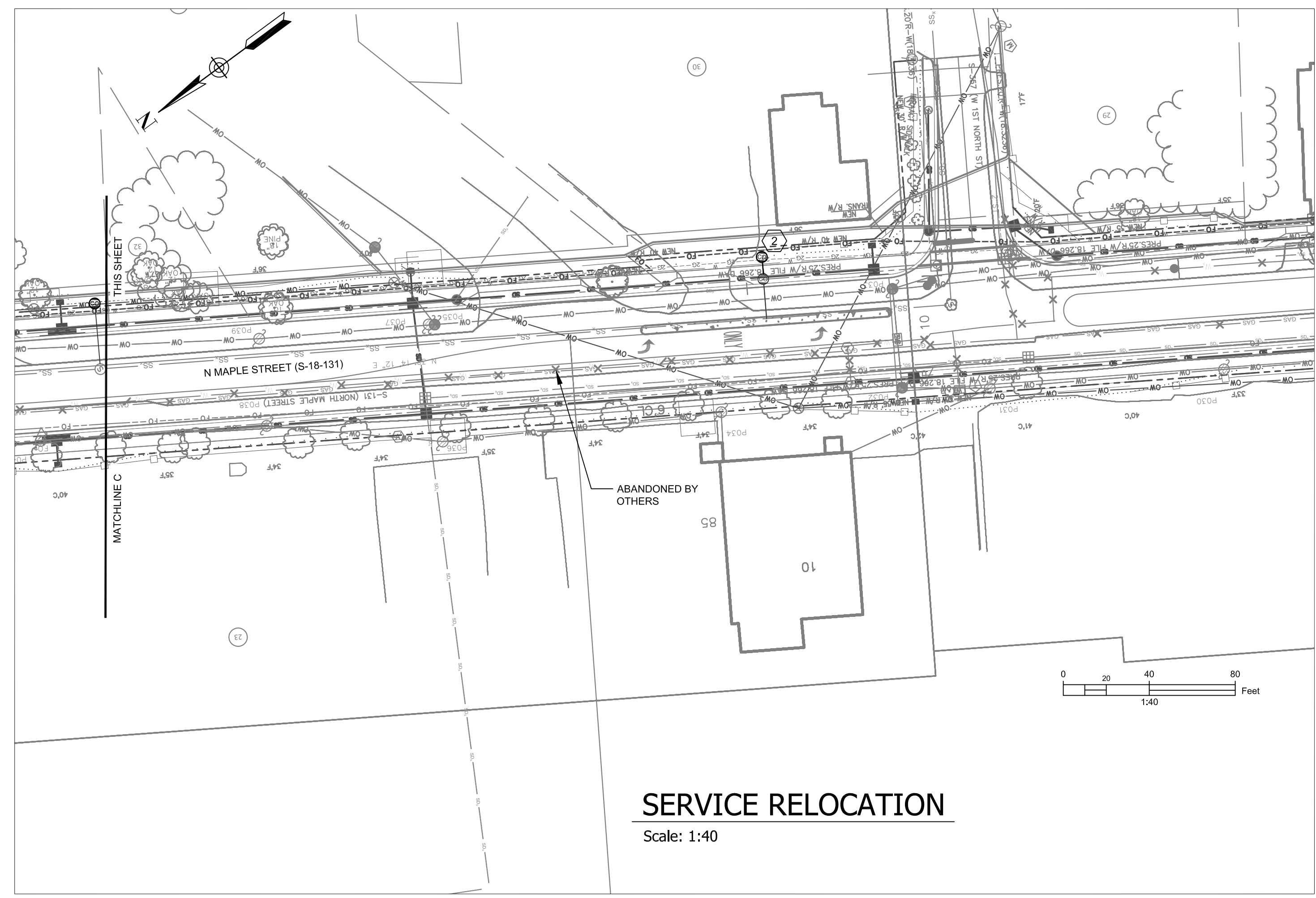
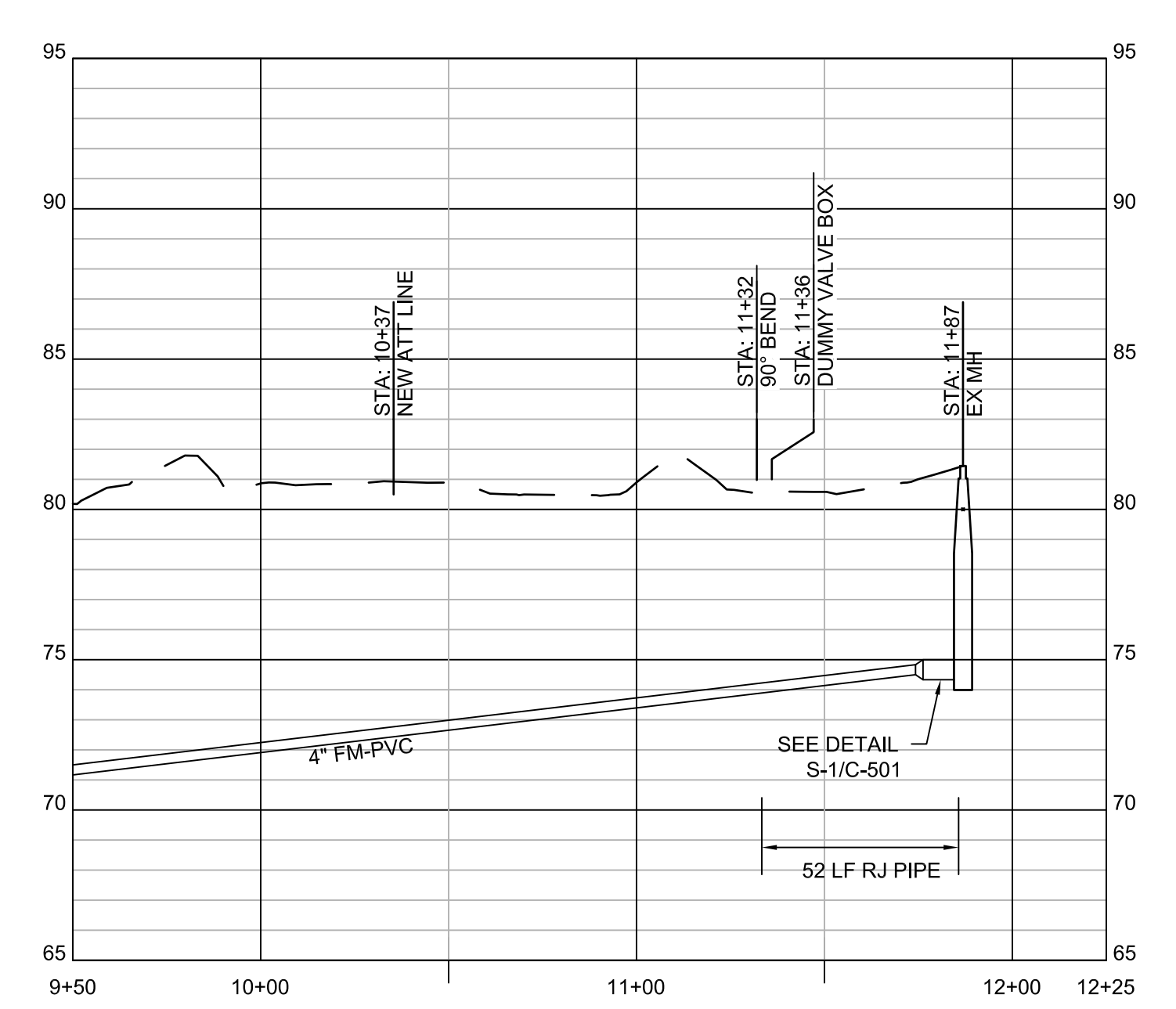
- NOTES:**
1. THE EXISTING DISCHARGE MANHOLE FOR THE RELOCATED 4" FORCE MAIN AND NEXT TWO DOWNSTREAM MANHOLES SHALL BE LINED IN ACCORDANCE WITH SPECIFICATIONS SECTION 33 01 30.63.
 2. S&EC MEASURES WILL BE INSTALLED BY OTHERS DURING CLEARING AND GRUBBING ACTIVITIES. THE CONTRACTOR SHALL MAINTAIN ALL S&EC MEASURES DURING THE CONSTRUCTION OF THE RELOCATED CWS UTILITIES. ANY S&EC MEASURES DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE OWNER.
 3. CONTRACTOR SHALL EXCAVATE TO VERIFY THE LOCATION OF THE EXISTING SERVICE LINE. IF SERVICE LINE EXISTS, A NEW CLEAN OUT SHALL BE INSTALLED AT THE NEW R/W LINE OR ABANDONED AS INDICATED. IF SERVICE DOES NOT EXIST, INSTALL SERVICE AND CLEANOUT AT NEW R/W LINE.
 4. EXISTING GRAVITY SEWER UPSTREAM OF THE MANHOLE SHOWN AT APPROXIMATELY STATION 11+00 SHALL BE ABANDONED IN PLACE AND FILLED WITH FLOWABLE FILL.
 5. NEW 24" SD-RCP TO BE INSTALLED DURING ROAD CONSTRUCTION BY OTHERS AFTER INSTALLATION OF FORCE MAIN.
 6. DOUBLE CLEANOUT TO BE INSTALLED AT NEW R/W WITH CONNECTION TO EXISTING MH AT APPROXIMATELY STATION 11+00.
 7. ROTATE MANHOLE CONE SECTION SO TOP OF MANHOLE SITS TOWARDS EAST SIDE OF ROAD.

8. LANE CLOSURES FOR PERFORMING WORK UNDER THE EXISTING PAVEMENT PROHIBITED DURING THE FOLLOWING HOURS:
 MON - FRI 6AM - 9AM
 3PM - 7PM
 SAT 11AM - 7PM
 SUN 11AM - 7PM
9. THE FORCE MAIN SHALL BE INSTALLED WITH A MINIMUM OF 18 INCHES BETWEEN THE BOTTOM OF THE ADJACENT 12-IN WATER LINE AND THE TOP OF THE FORCE MAIN FROM STA. 6+95 TO STA. 11+33.



4-INCH FORCE MAIN
Scale: 1:40

4-INCH FORCE MAIN
H: 1"=40'
V: 1"=5'



SERVICE RELOCATION
Scale: 1:40

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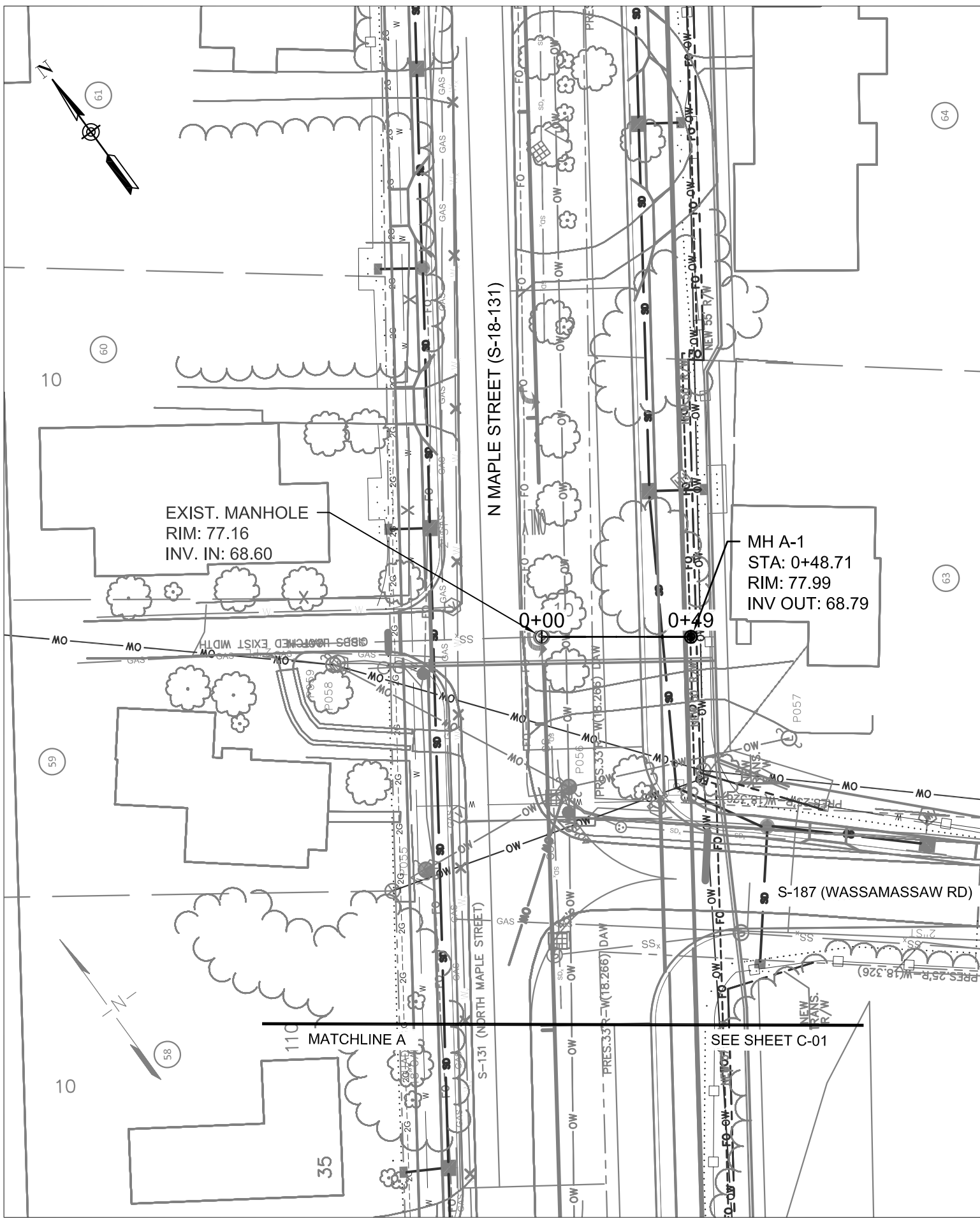
PROJECT NAME: MAPLE STREET FORCE MAIN RELOCATION FOR DORCHESTER COUNTY WATER AND SEWER DEPARTMENT
 DRAWING TITLE: 4IN FORCE MAIN STA. 9+50 TO 11+89

PROJ. MGR.: WRF
 DESIGN BY: WRF
 DRAWN BY: CBB
 PROJ. DATE: 10-12-2018
 DRAWING NUMBER:

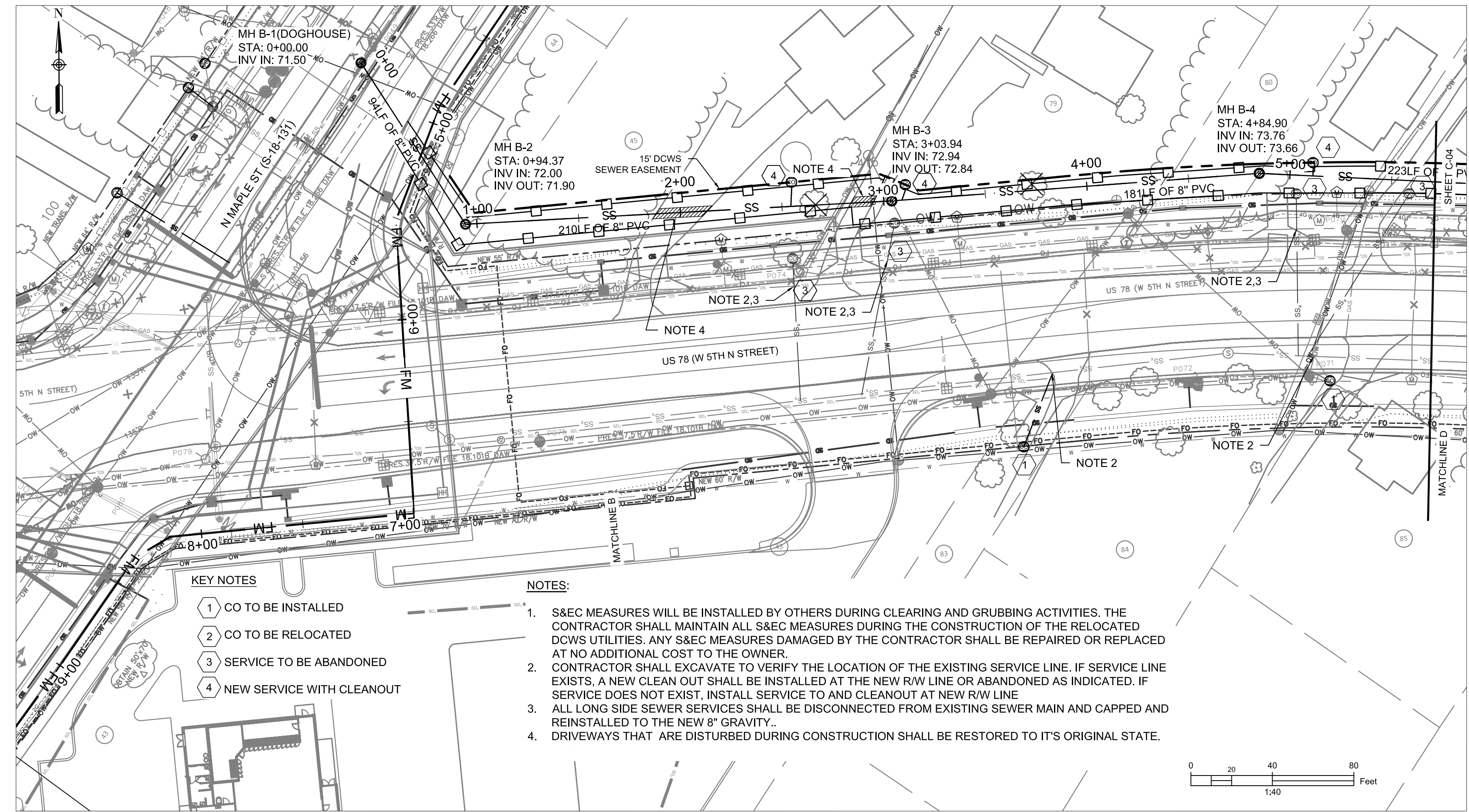
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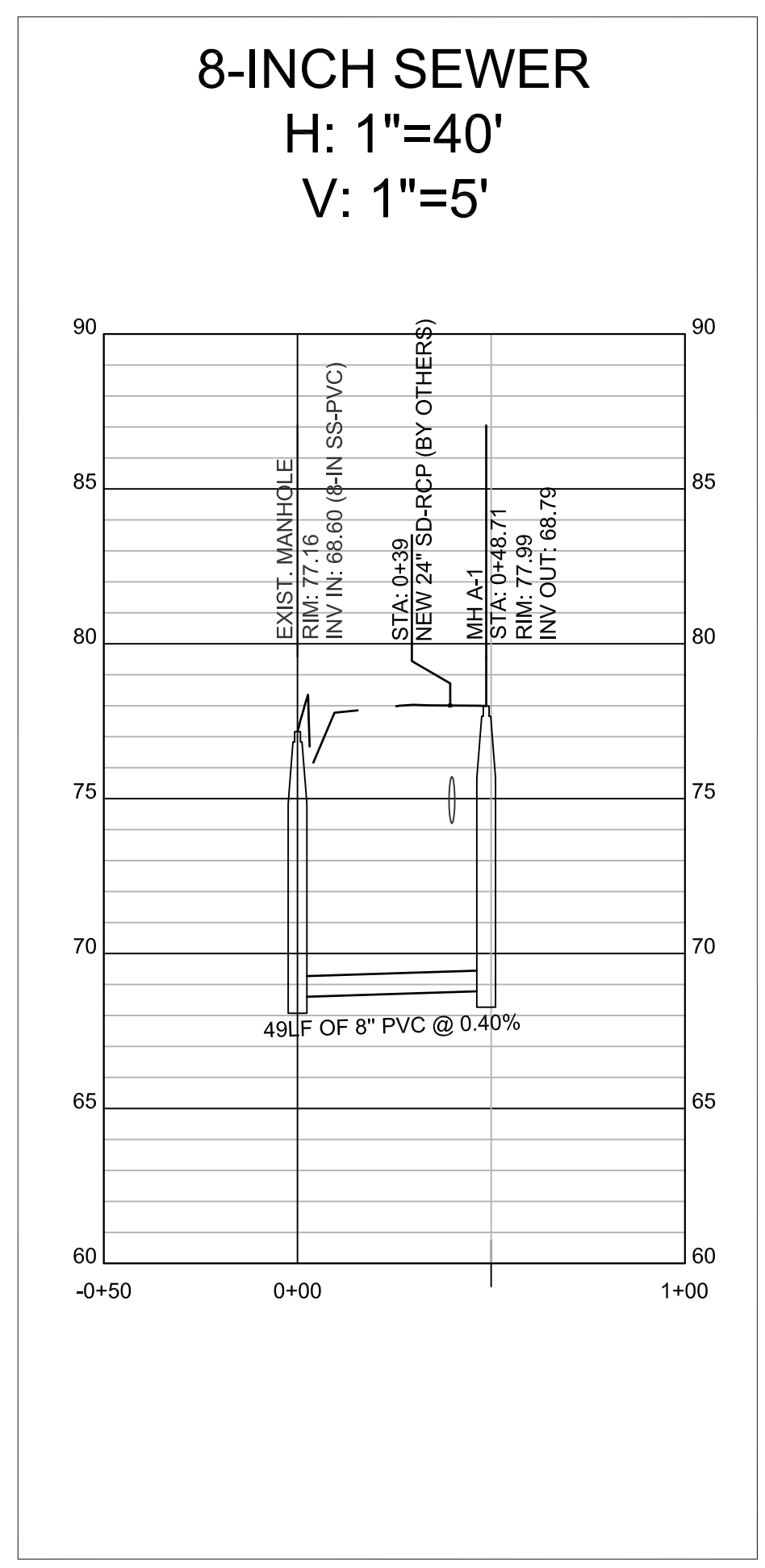
STATE OF SOUTH CAROLINA, DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, PROJECT NO. 20180371.00.CH, DRAWING NO. C-03, SHEET 1 OF 1. THIS DRAWING IS THE PROPERTY OF WK DICKSON & COMPANY, INC. AND IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED HEREON. ANY REUSE OR MODIFICATION OF THIS DRAWING WITHOUT THE WRITTEN CONSENT OF WK DICKSON & COMPANY, INC. IS PROHIBITED. ONE COPY OF THIS DRAWING IS TO BE MAINTAINED AT THE PROJECT SITE. ALL OTHER COPIES OF THIS DRAWING ARE TO BE CONSIDERED UNAUTHORIZED. THE USER OF THIS DRAWING SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE USER OF THIS DRAWING SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE USER OF THIS DRAWING SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.



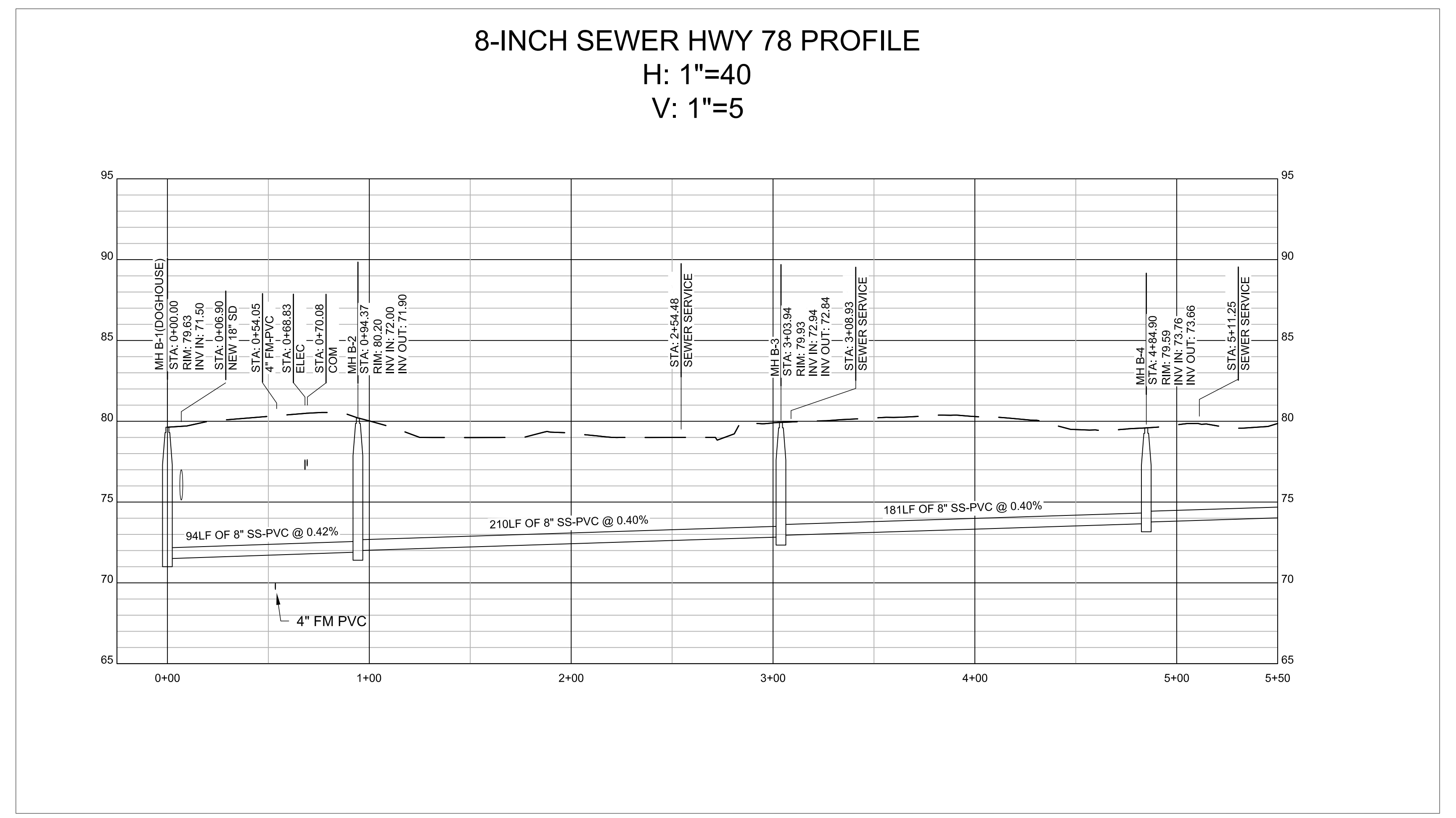
8-INCH SEWER
Scale: 1:40



8-INCH SEWER HWY 78
Scale: 1:40



8-INCH SEWER
H: 1"=40'
V: 1"=5'



8-INCH SEWER HWY 78 PROFILE
H: 1"=40'
V: 1"=5'

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PROJECT NAME:
MAPLE STREET FORCE MAIN RELOCATION
FOR
DORCHESTER COUNTY WATER AND SEWER DEPARTMENT
DRAWING TITLE:
8IN SANTARY SEWER

PROJ. MGR.: WRF
DESIGN BY: WRF
DRAWN BY: CBB
PROJ. DATE: 10-12-2018
DRAWING NUMBER:

C-03
WKD PROJ. NO.:
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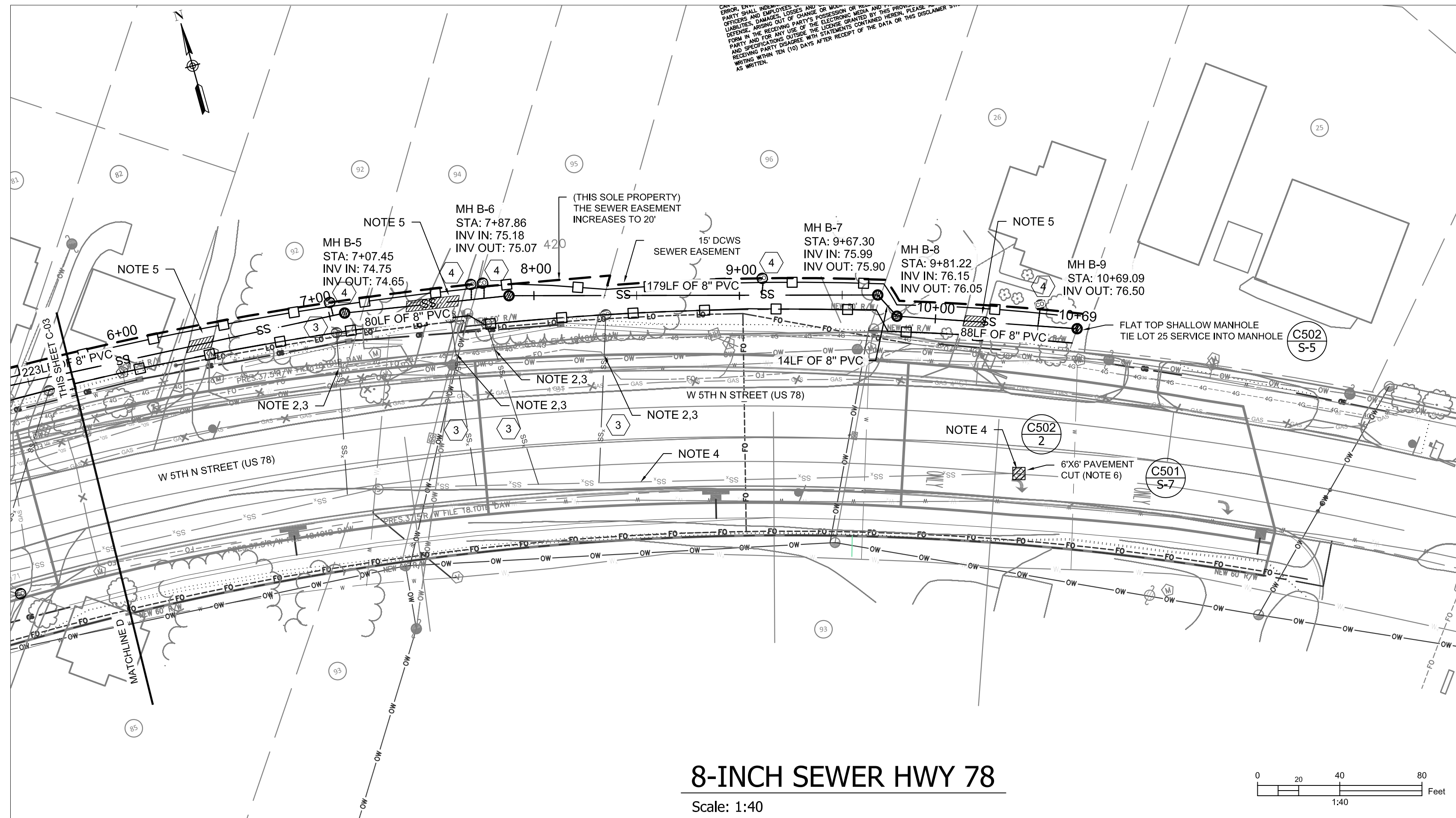
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 100% REVIEW SET - NOT FOR CONSTRUCTION DESCRIPTION
 PROJECT NAME: MAPLE STREET FORCE MAIN RELOCATION FOR DORCHESTER COUNTY WATER AND SEWER DEPARTMENT
 DRAWING TITLE: 8IN SANITARY SEWER
 PROJ. MGR.: WRF
 DESIGN BY: WRF
 DRAWN BY: CBB
 PROJ. DATE: 10-12-2018
 DRAWING NUMBER:
C-04
 WKD PROJ. NO.: 20180371.00.CH

KEY NOTES

- 1 CO TO BE INSTALLED
- 2 CO TO BE RELOCATED
- 3 SERVICE TO BE ABANDONED
- 4 NEW SERVICE WITH CLEANOUT

NOTES:

- S&EC MEASURES WILL BE INSTALLED BY OTHERS DURING CLEARING AND GRUBBING ACTIVITIES. THE CONTRACTOR SHALL MAINTAIN ALL S&EC MEASURES DURING THE CONSTRUCTION OF THE RELOCATED DCWS UTILITIES. ANY S&EC MEASURES DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL EXCAVATE TO VERIFY THE LOCATION OF THE EXISTING SERVICE LINE. IF SERVICE LINE EXISTS, A NEW CLEAN OUT SHALL BE INSTALLED AT THE NEW RW LINE OR ABANDONED AS INDICATED. IF SERVICE DOES NOT EXIST, INSTALL SERVICE TO AND CLEANOUT AT NEW RW LINE.
- ALL LONG SIDE SEWER SERVICES SHALL BE DISCONNECTED FROM EXISTING SEWER MAN AND CAPPED AND REINSTATED TO THE NEW 8" GRAVITY.
- ABANDON THE SEGMENT OF EXISTING 8" SEWER MAIN AND THE TERMINAL UPSTREAM MANHOLE BY PLUGGING THE LINE AT THE DOWNSTREAM MANHOLE AND FILLING THE SEGMENT TO BE ABANDON WITH FLOWABLE FILL. ABANDON THE MANHOLE AS SHOWN IN DETAIL 2, ON SHEET C-502.
- DRIVEWAYS THAT ARE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ITS ORIGINAL STATE.
- LANE CLOSURES FOR PERFORMING WORK UNDER THE EXISTING PAVEMENT PROHIBITED DURING THE FOLLOWING HOURS:
 MON - FRI 6AM - 9AM
 12PM(NOON) - 7PM
 SAT 11AM - 7PM
 SUN 11AM - 7PM



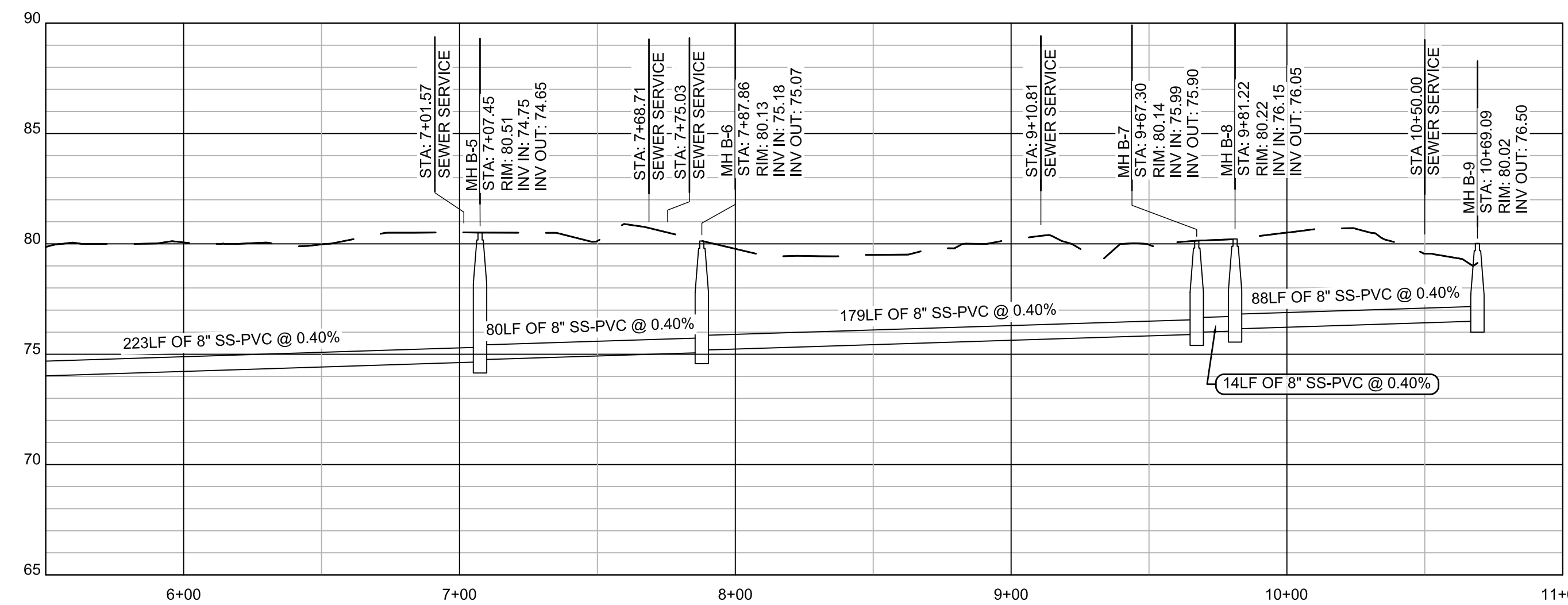
8-INCH SEWER HWY 78

Scale: 1:40

8-INCH SEWER HWY 78 PROFILE

H: 1"=40

V: 1"=5



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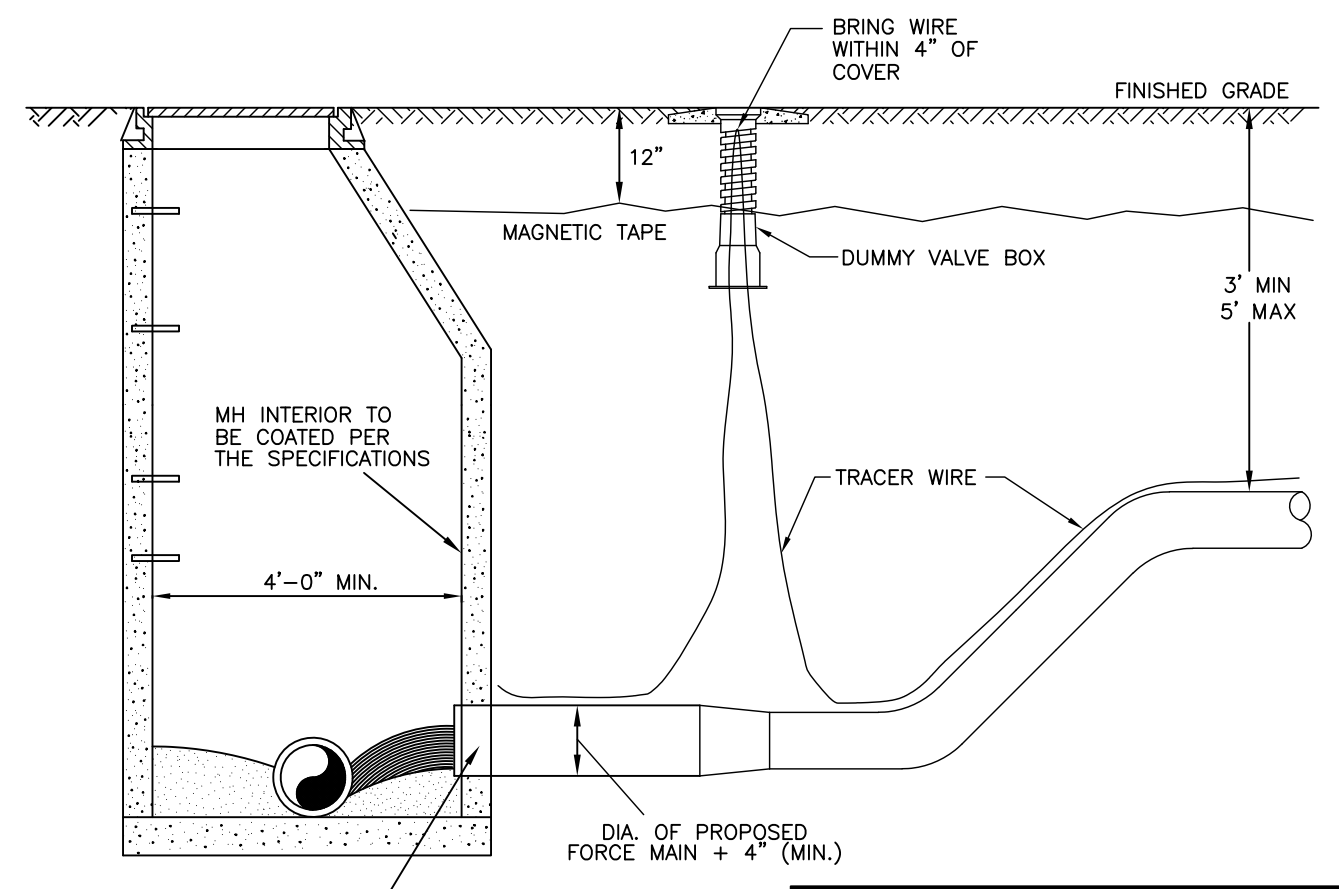
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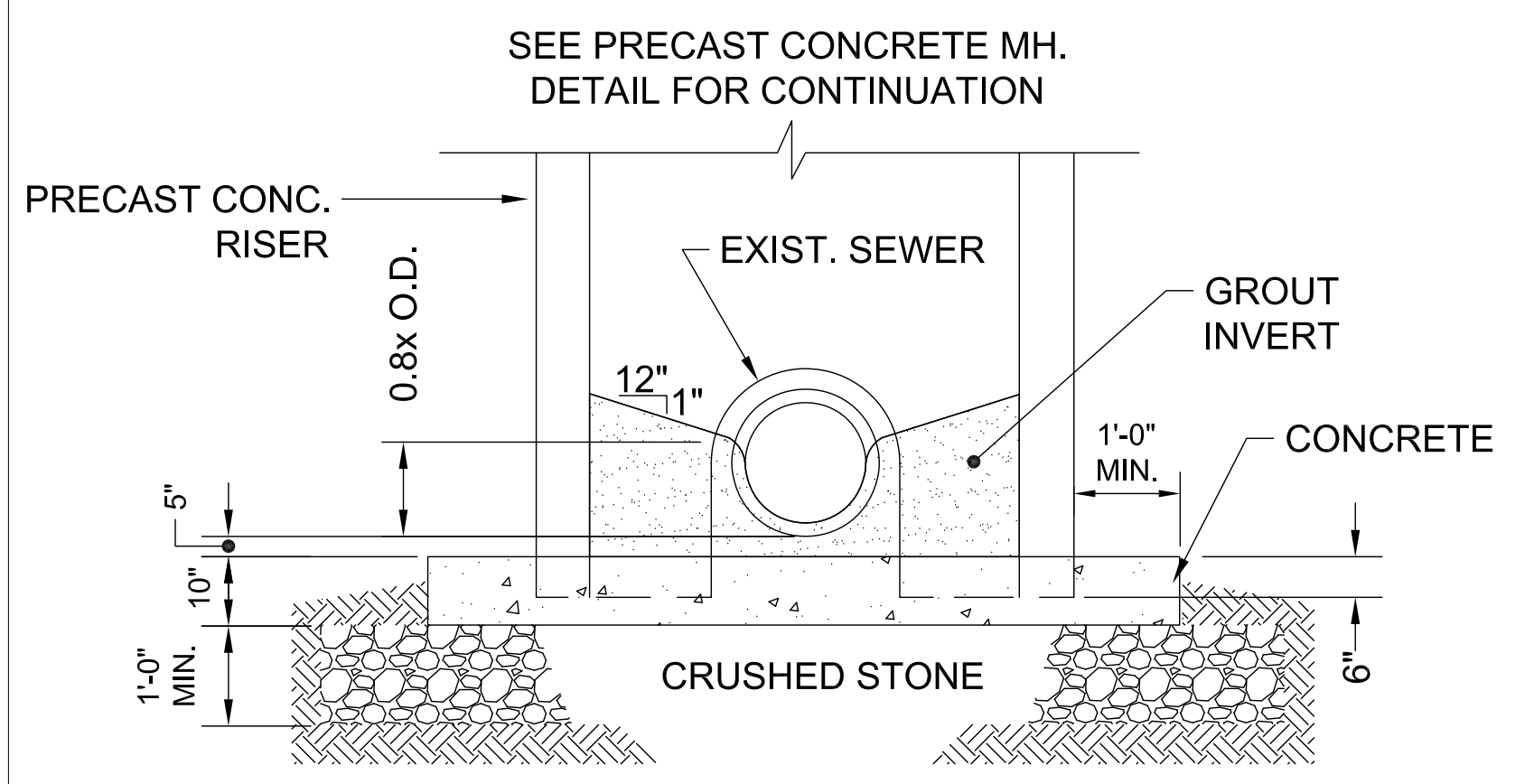
PROJECT NAME:
 MAPLE STREET FORCE MAIN RELOCATION
 FOR
 DORCHESTER COUNTY WATER AND SEWER DEPARTMENT
 DRAWING TITLE:
 8IN SANITARY SEWER

PROJ. MGR.: WRF
 DESIGN BY: WRF
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 PROJ. DATE: 10-12-2018
 DRAWING NUMBER:
C-04
 WKD PROJ. NO.:
 20180371.00.CH

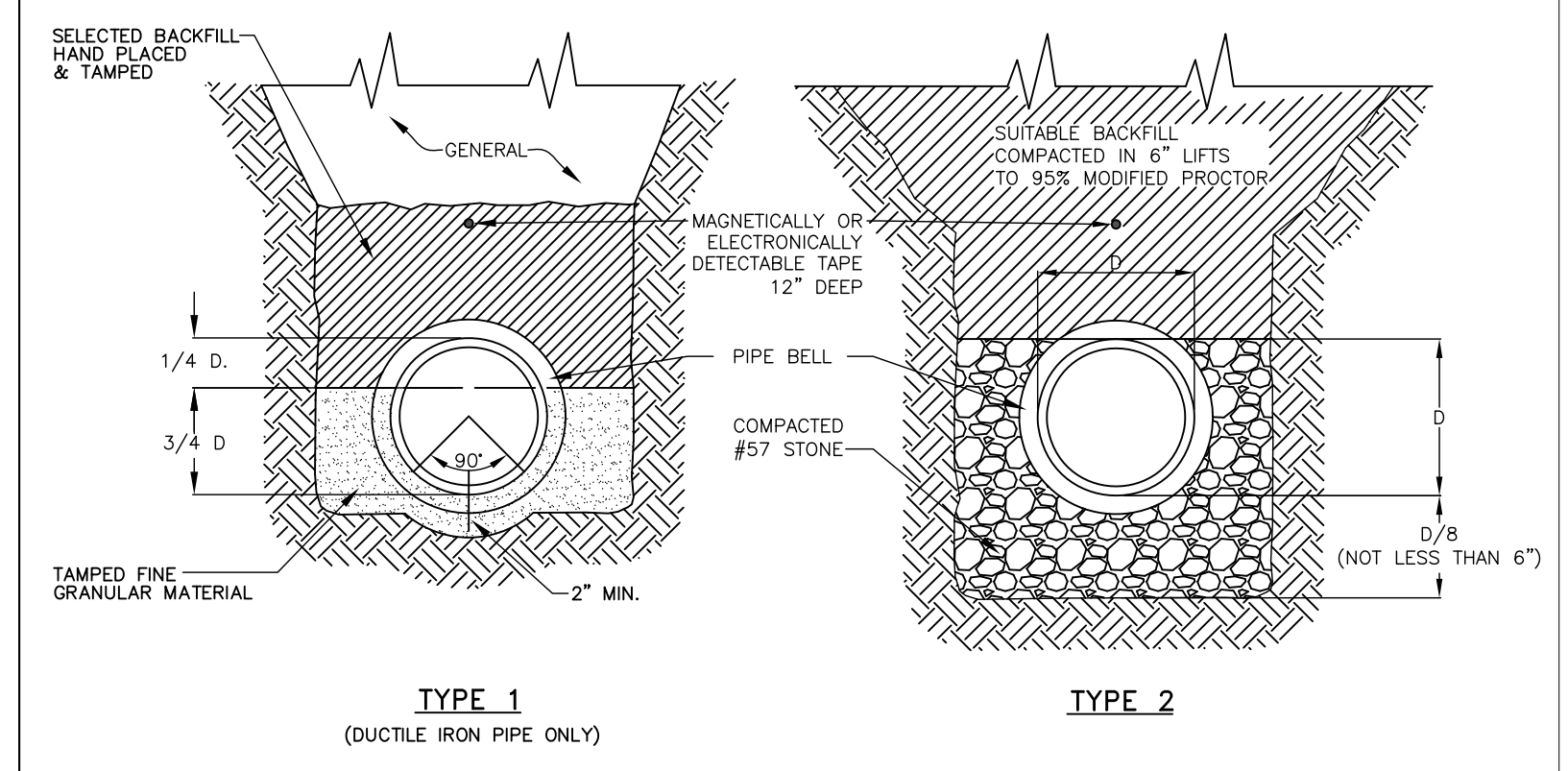
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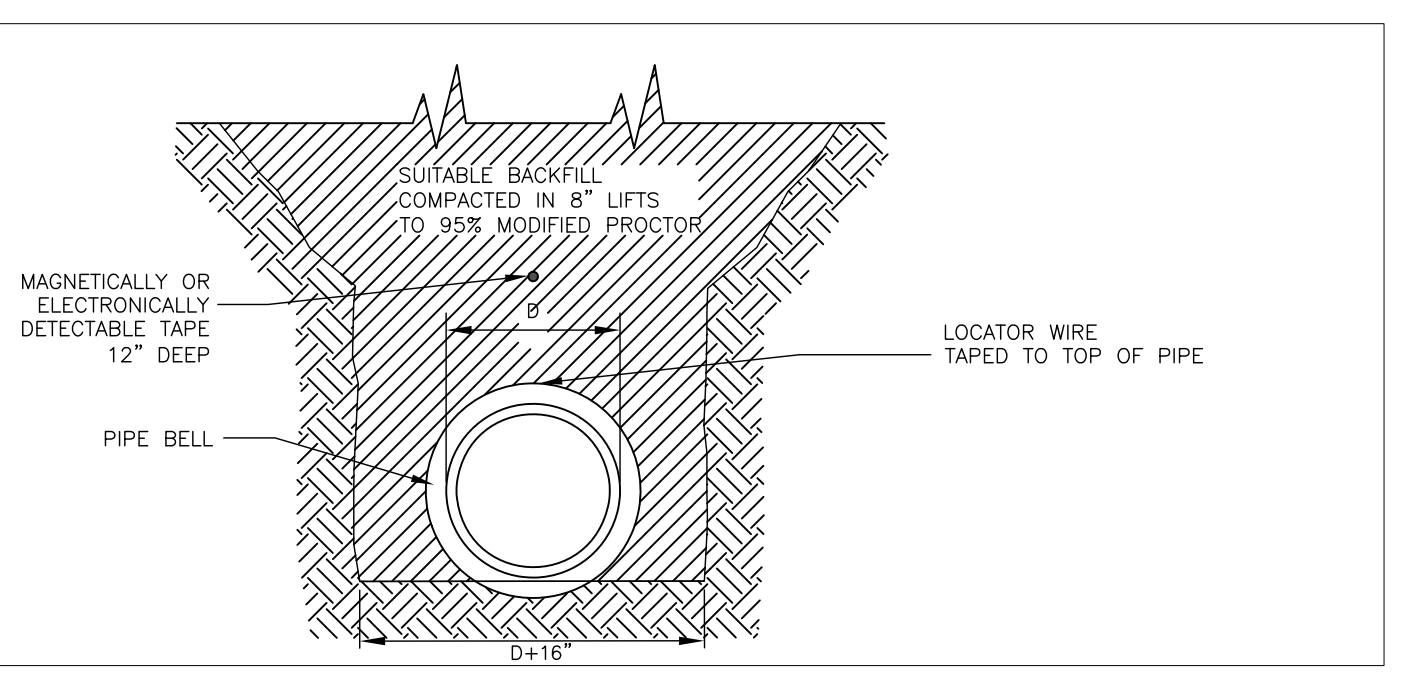
DORCHESTER COUNTY WATER & SEWER	
FORCE MAIN TIE-IN AT MANHOLE	DRAWING: S-1
DATE: APRIL 2012	DRAWN BY: STL
SCALE: NTS	APPROVED BY: JDC



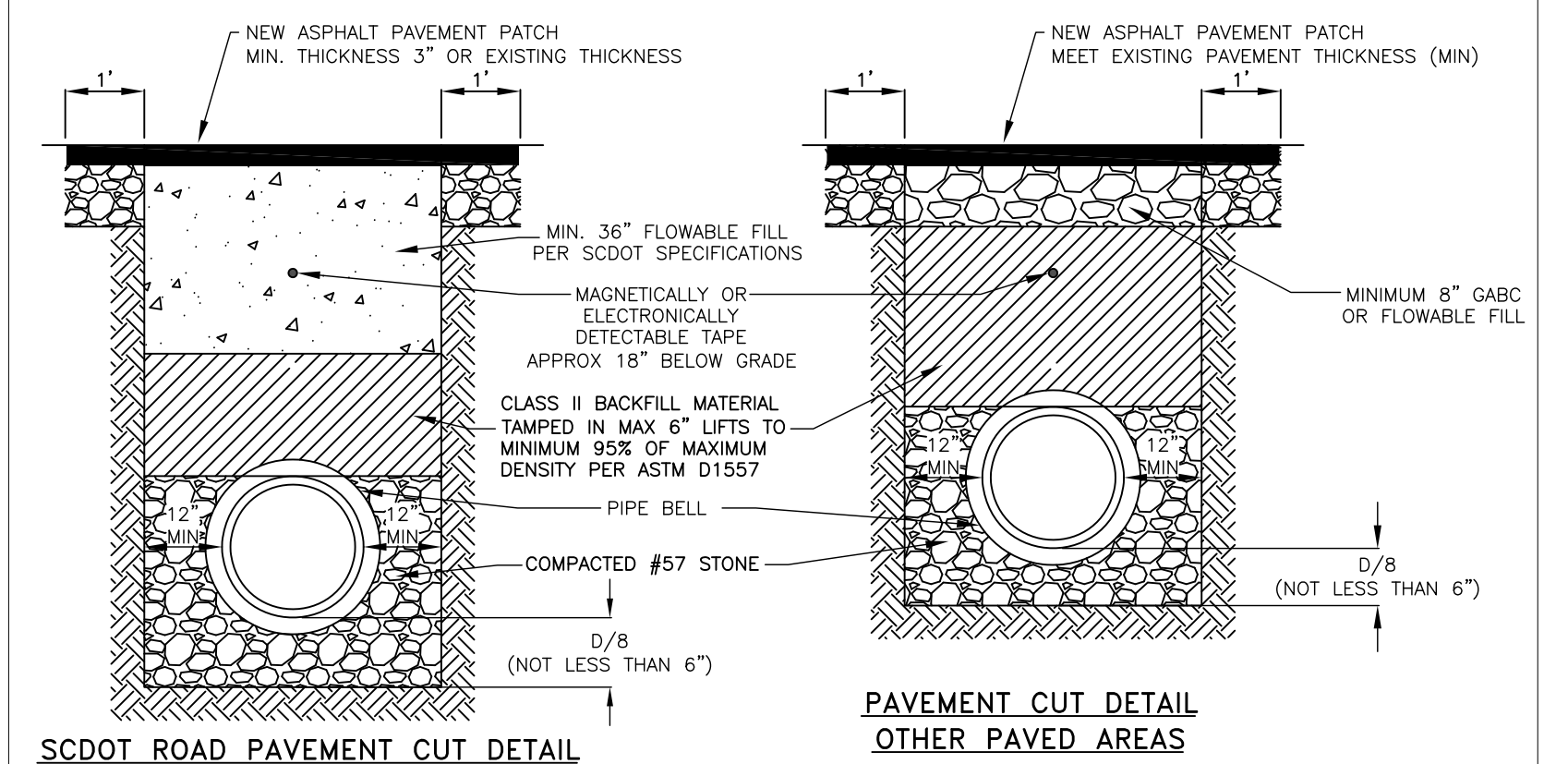
2 DOGHOUSE MANHOLE DETAIL
Scale: N.T.S.



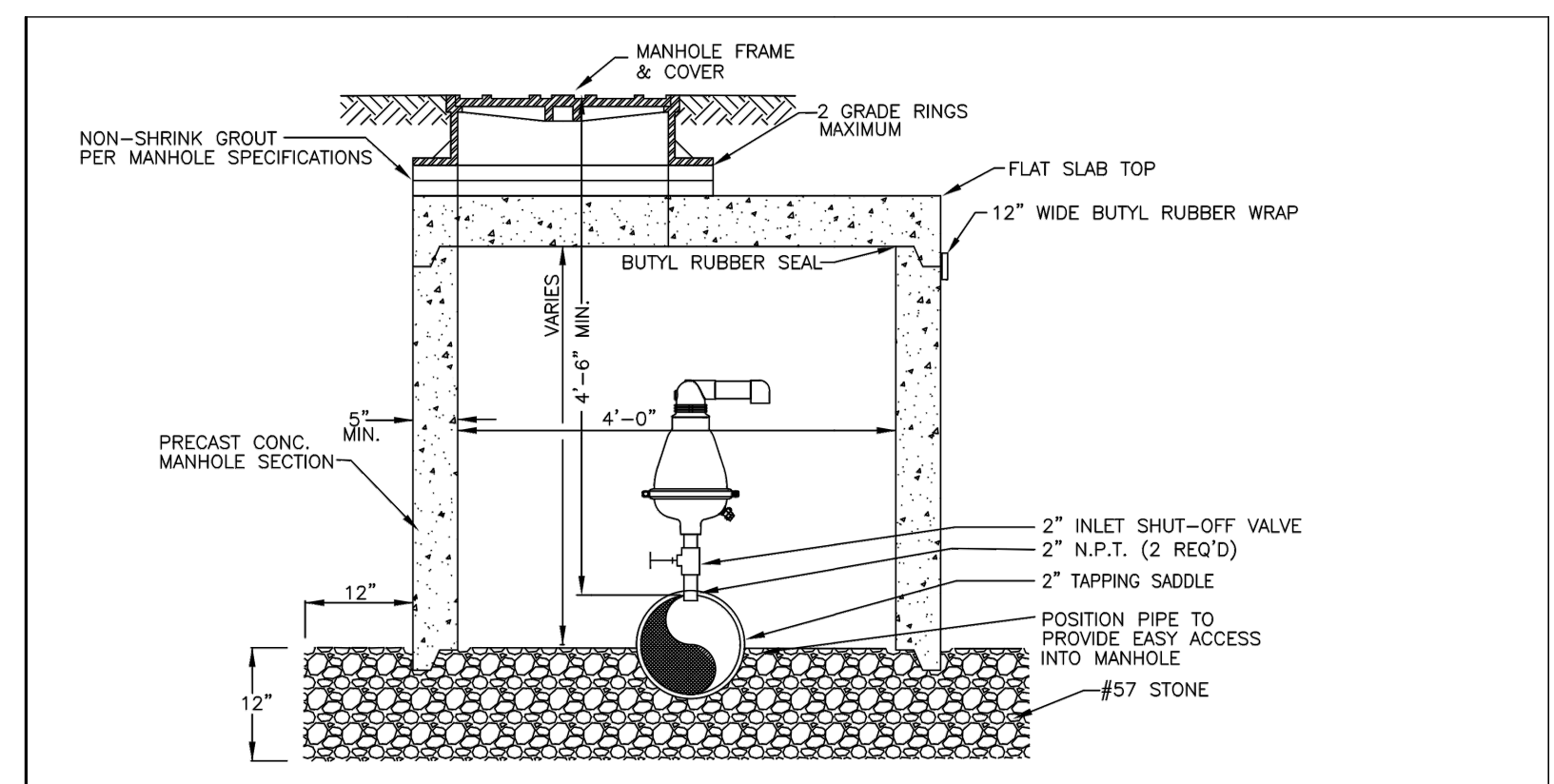
DORCHESTER COUNTY WATER & SEWER	
CLASS B BEDDING	DRAWING: S-6
DATE: APRIL 2012	DRAWN BY: JDC
SCALE: NTS	APPROVED BY: KJC



1 TYP. FORCE MAIN BEDDING
Scale: N.T.S.

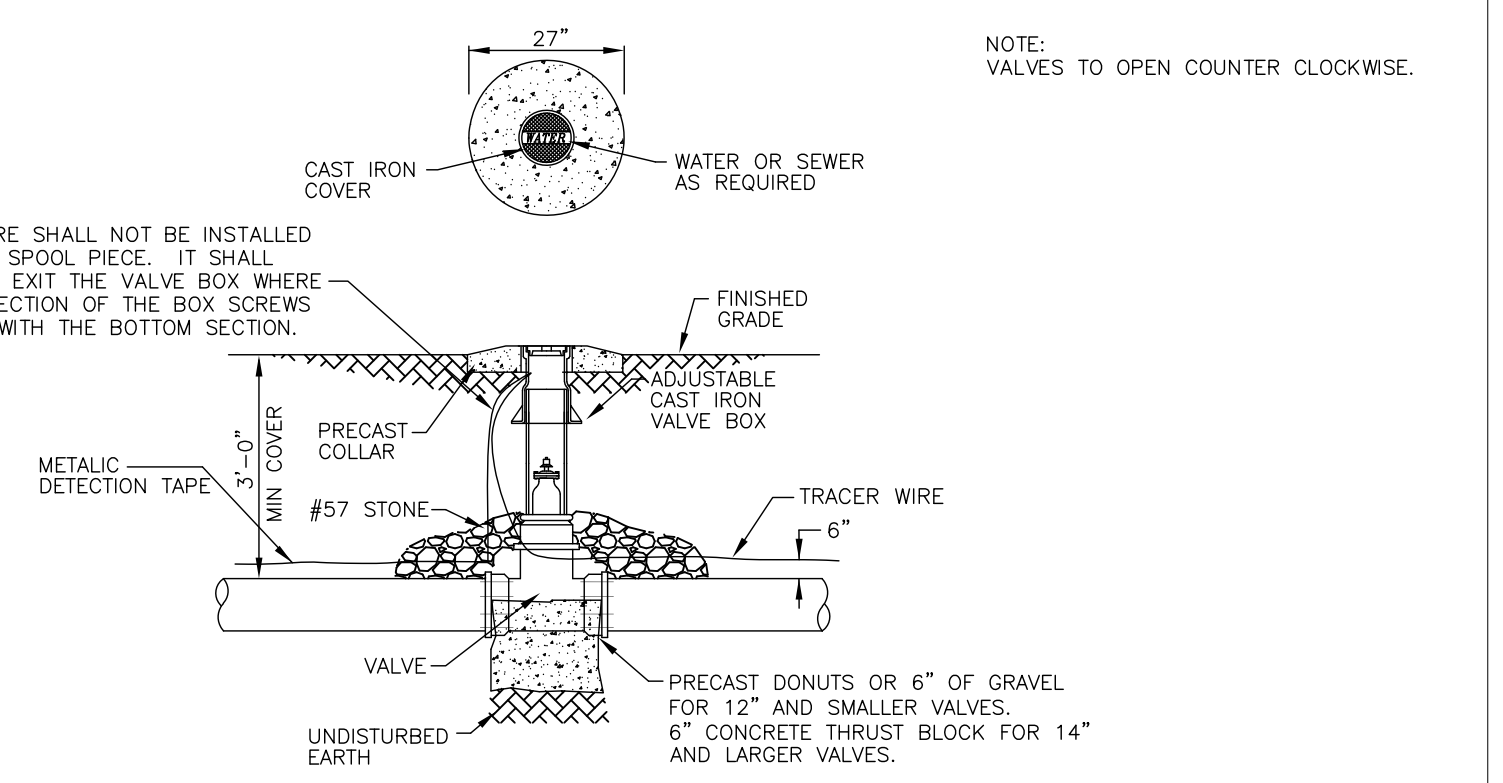


DORCHESTER COUNTY WATER & SEWER	
PAVEMENT CUT DETAILS	DRAWING: S-7
DATE: MARCH 2012	DRAWN BY: JDC
SCALE: NTS	APPROVED BY: KJC

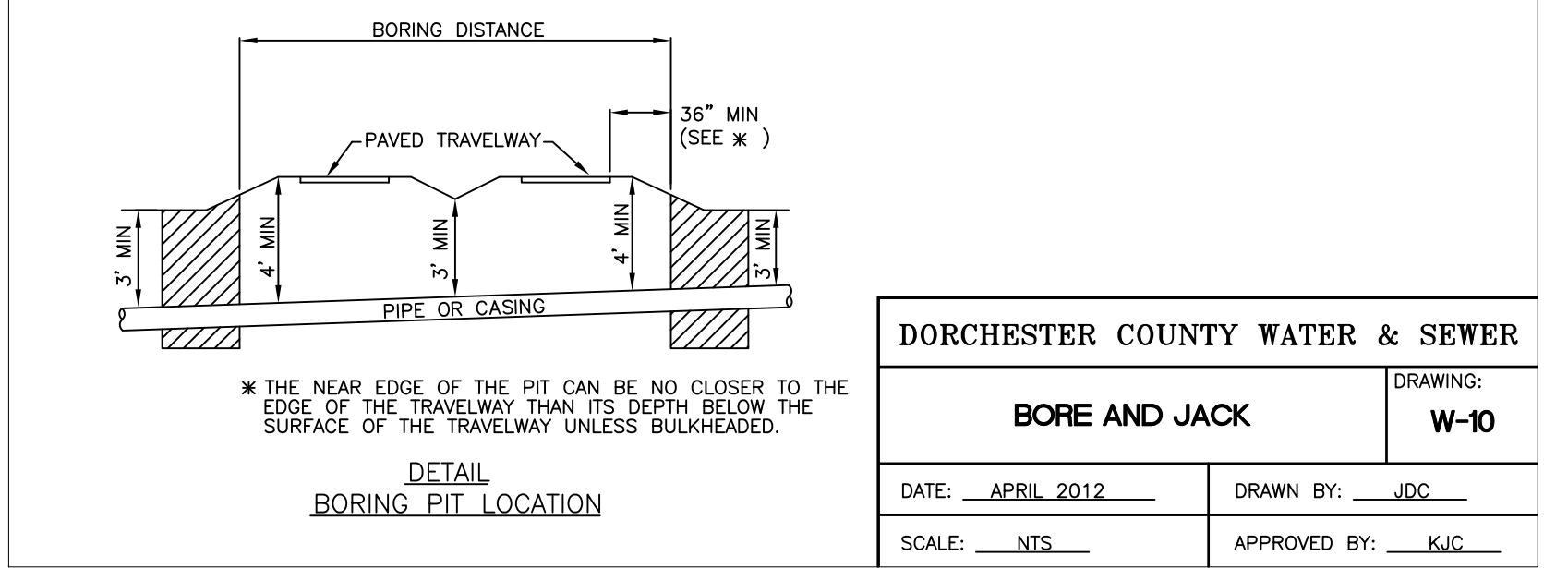
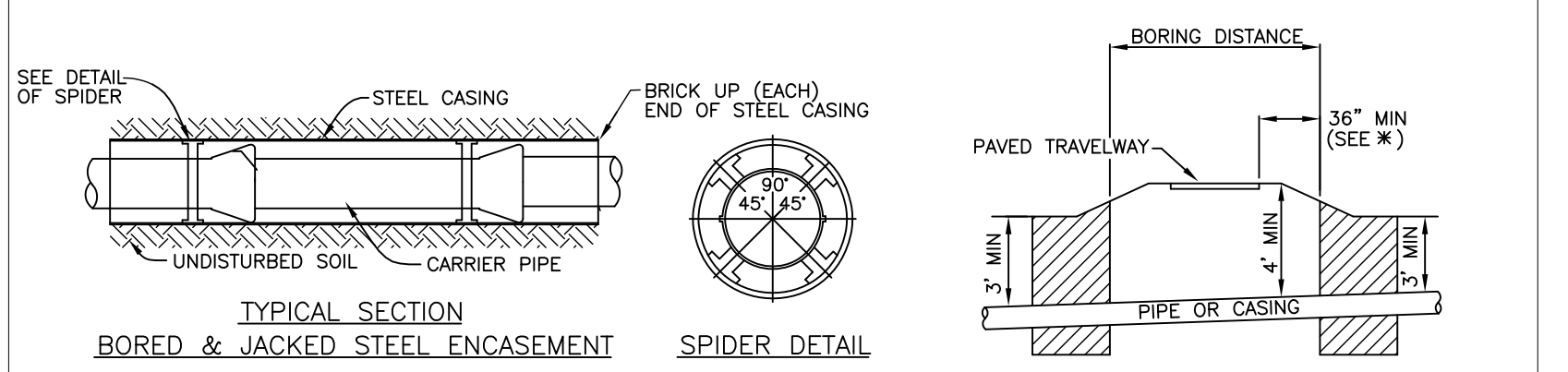


NOTES:
1. AIR RELEASE VALVE SHALL BE A.R.I. D-025, OR DEPARTMENT APPROVED EQUAL.
2. AIR RELEASE VALVE, TOP SLAB, AND COVER SHALL BE PLACED SO THAT THE VALVE CAN BE REMOVED AND REPLACED.

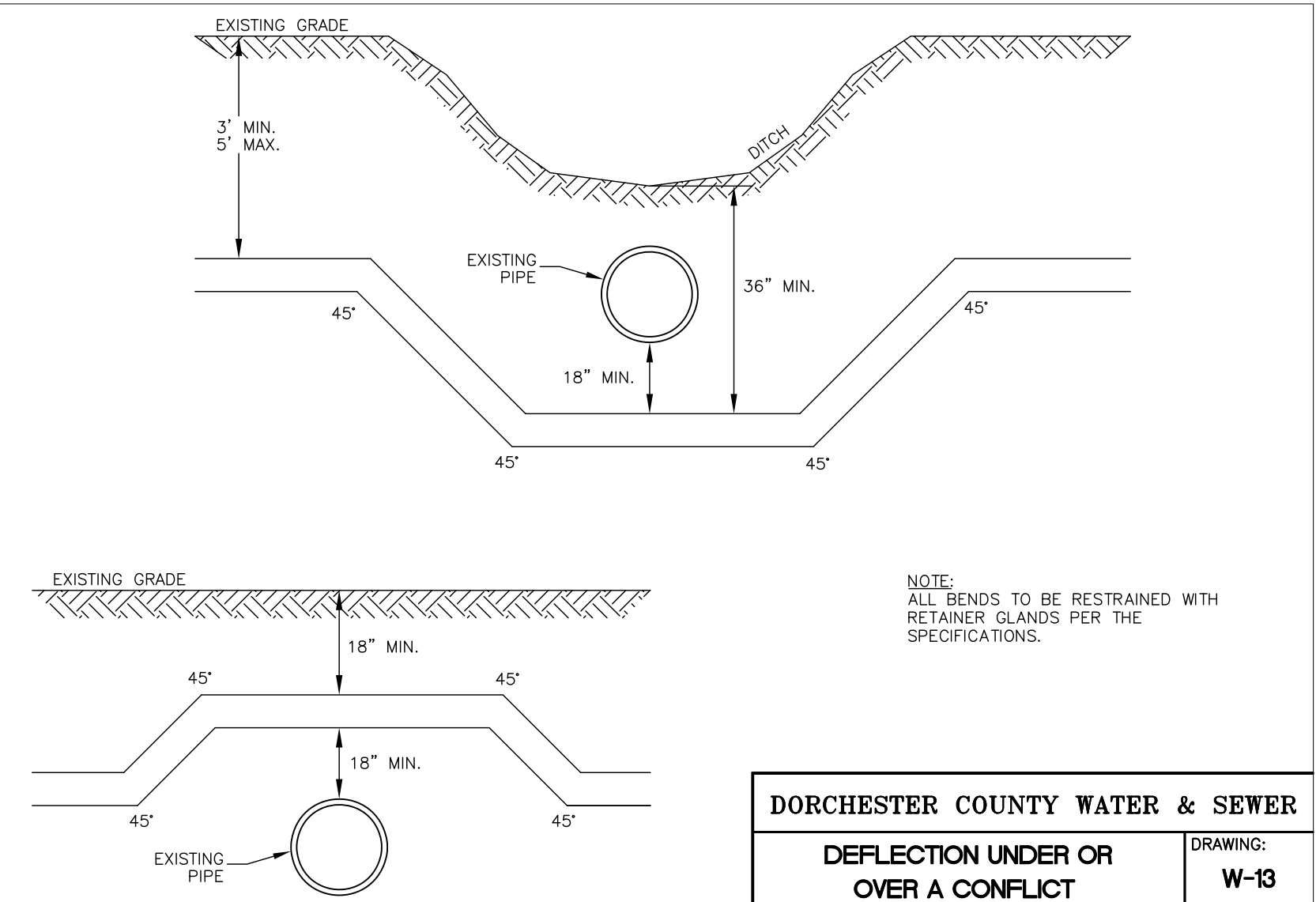
DORCHESTER COUNTY WATER & SEWER	
AIR RELEASE VALVE WITH MANHOLE	DRAWING: S-2
DATE: SEPTEMBER 2010	DRAWN BY: STL
SCALE: NTS	APPROVED BY: JDC



DORCHESTER COUNTY WATER & SEWER	
VALVE AND VALVE BOX	DRAWING: W-8
DATE: APRIL 2012	DRAWN BY: JDC
SCALE: NTS	APPROVED BY: KJC

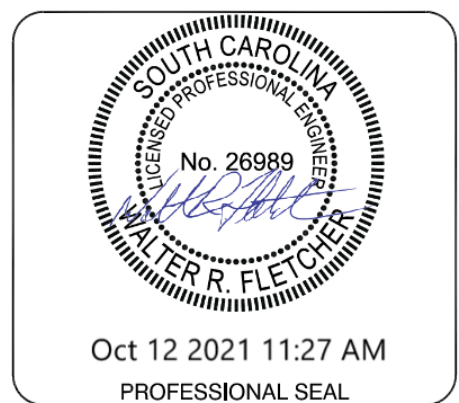
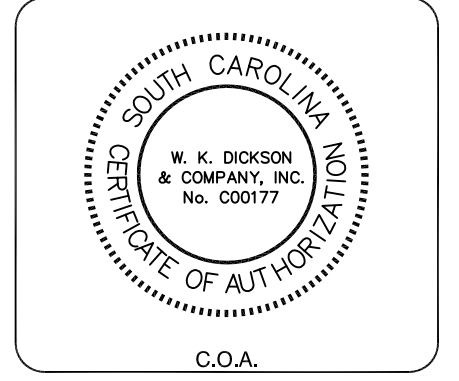


DORCHESTER COUNTY WATER & SEWER	
BORE AND JACK	DRAWING: W-10
DATE: APRIL 2012	DRAWN BY: JDC
SCALE: NTS	APPROVED BY: KJC



DORCHESTER COUNTY WATER & SEWER	
DEFLECTION UNDER OR OVER A CONFLICT	DRAWING: W-13
DATE: APRIL 2012	DRAWN BY: STL
SCALE: NTS	APPROVED BY: JDC

WK DICKSON
 community infrastructure consultants
 162 SEVEN FARMS DRIVE
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 CHARLESTON, SC 29492
 (843) 416-5560
 (843) 416-5563
 WWW.WKDICKSON.COM



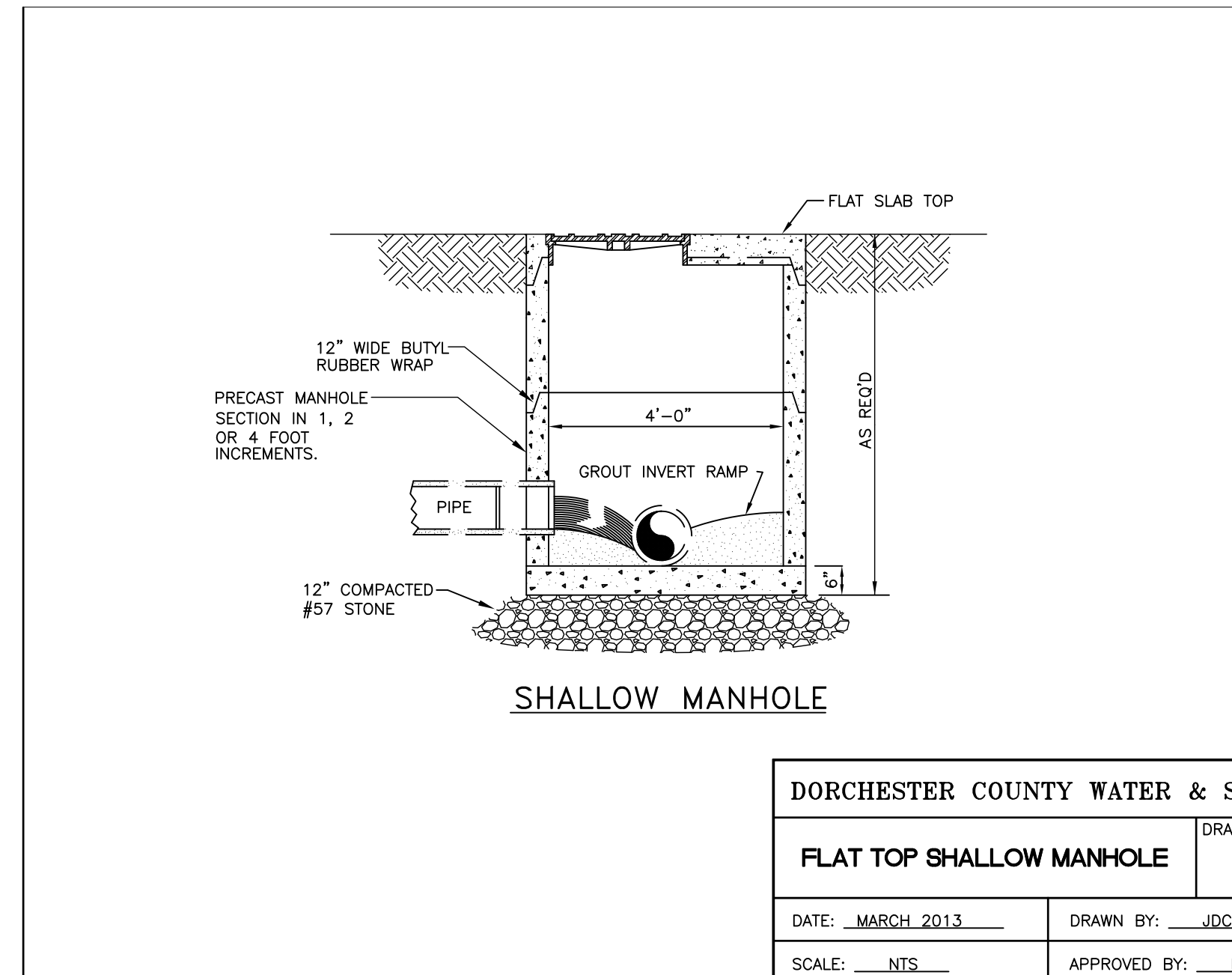
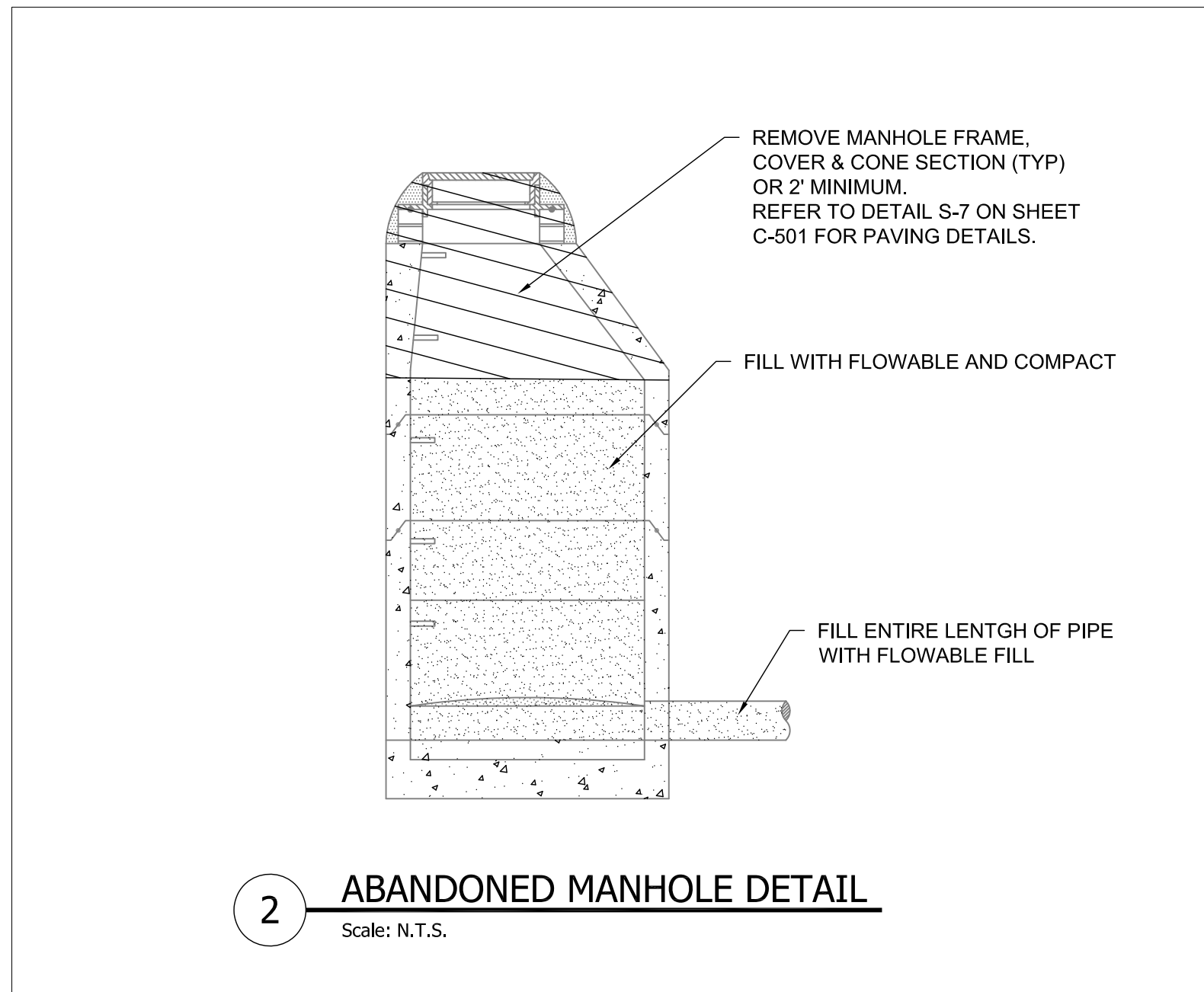
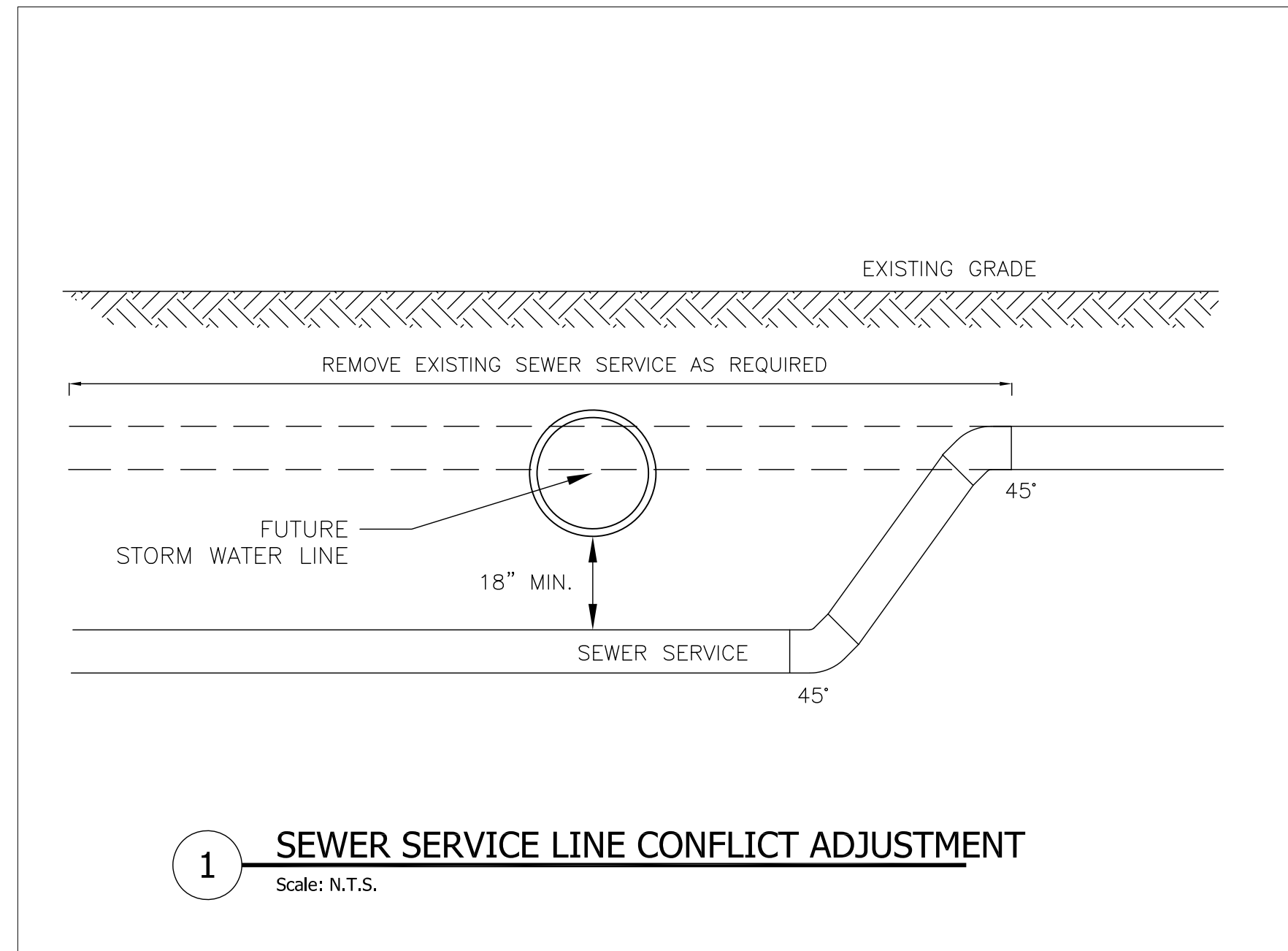
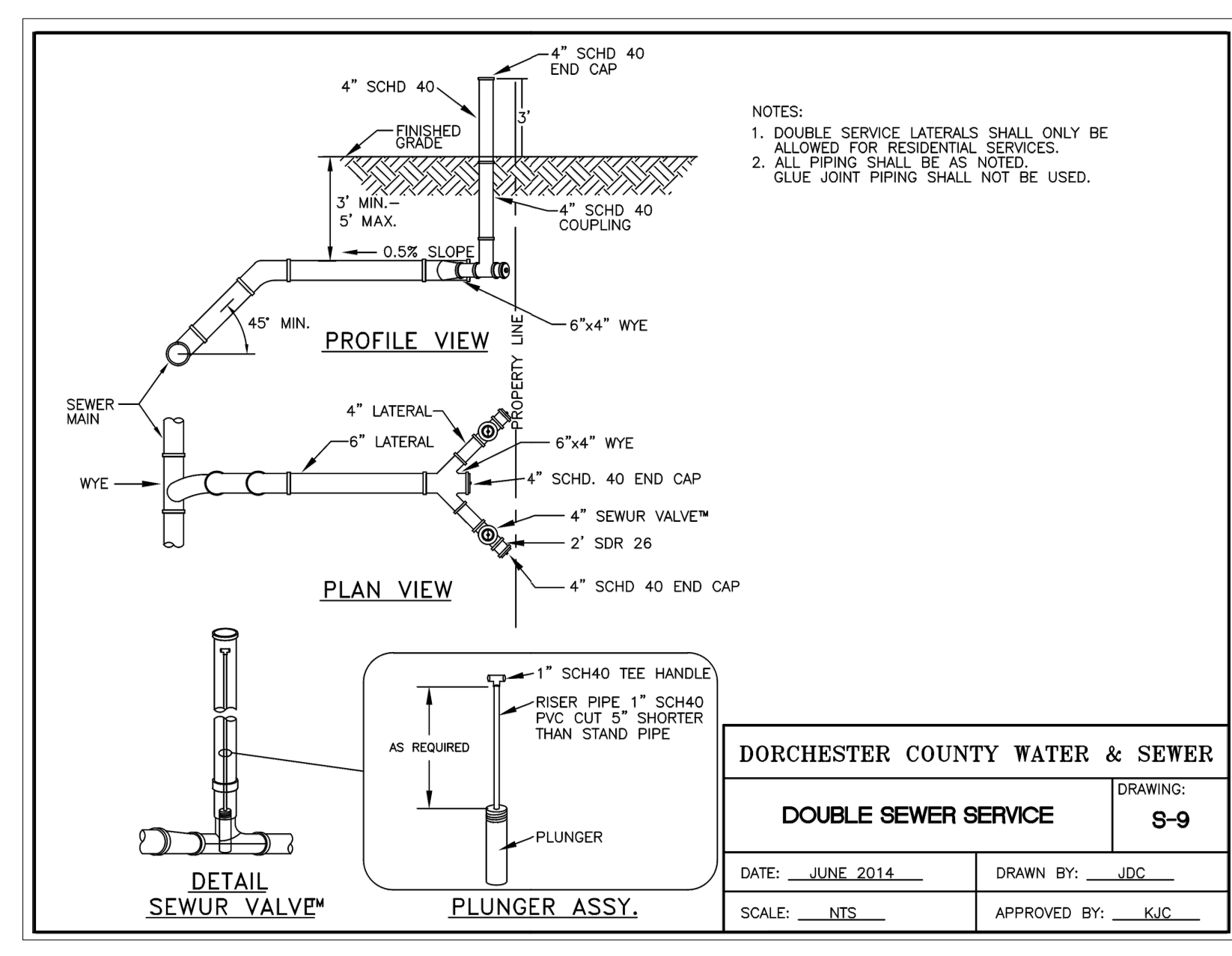
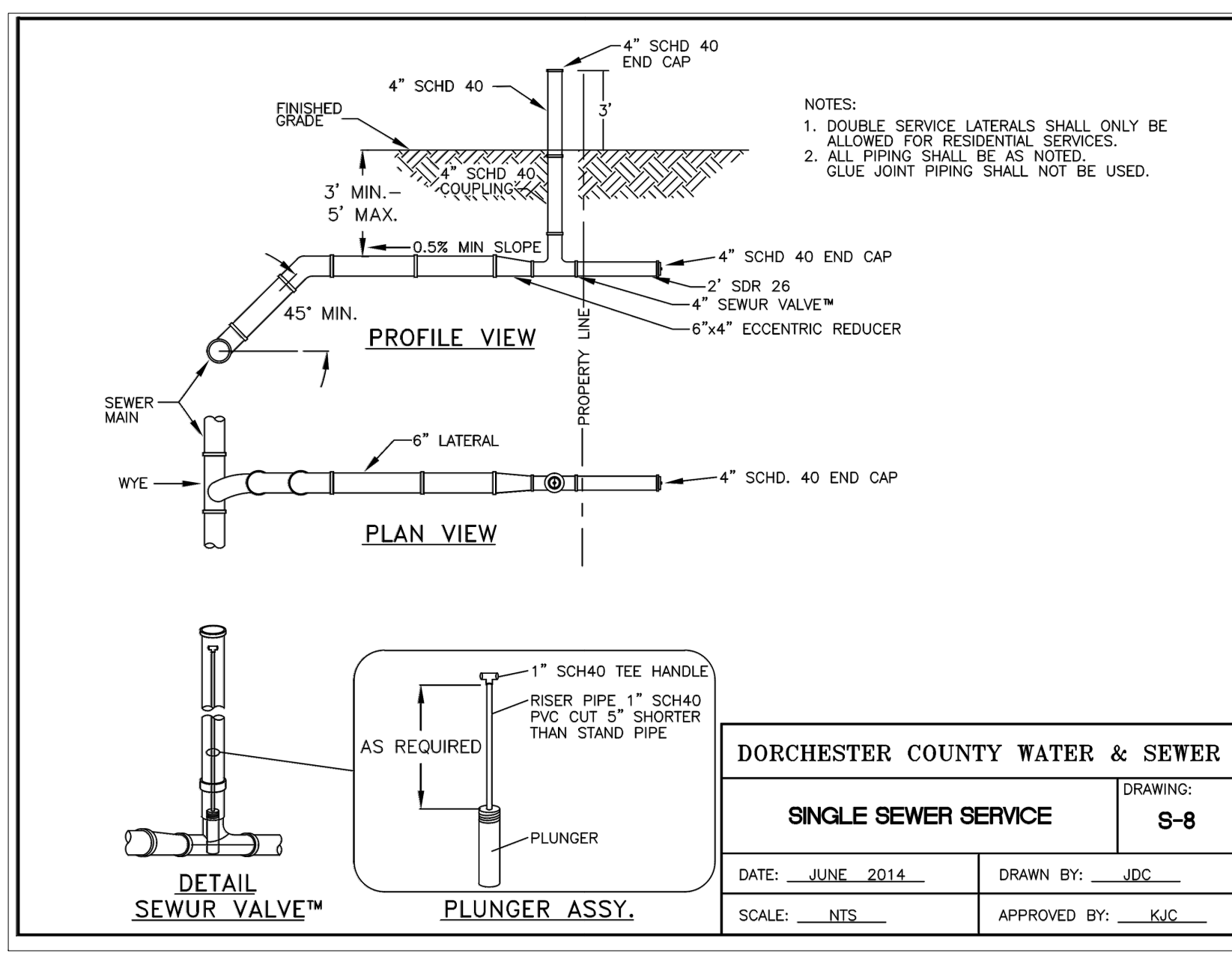
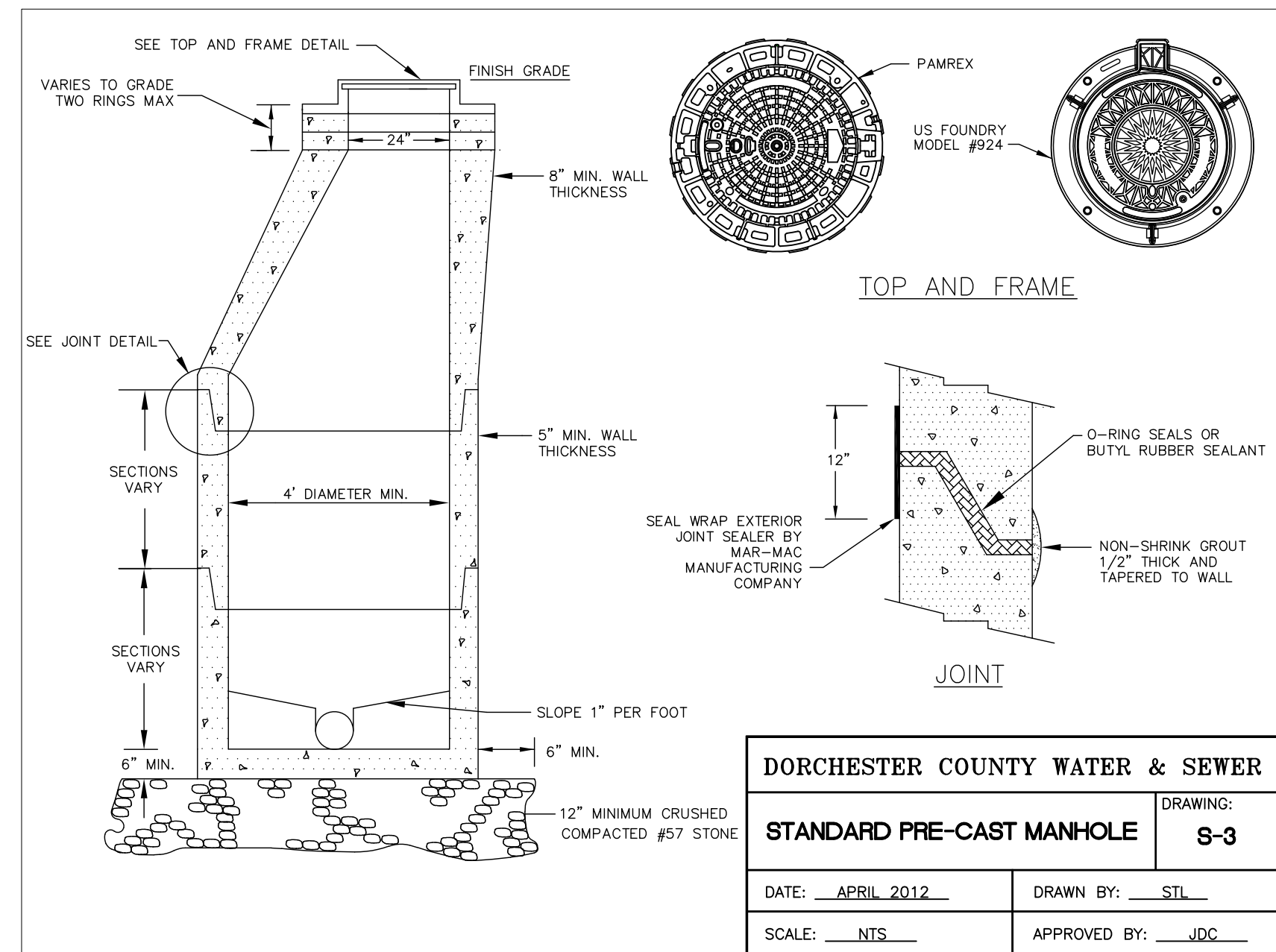
REVISION RECORD	NO.	DATE	DESCRIPTION	BY
	A	10/02/19	100% REVIEW SET - NOT FOR CONSTRUCTION	WRF

PROJECT NAME: MAPLE STREET FORCE MAIN RELOCATION FOR DORCHESTER COUNTY WATER AND SEWER DEPARTMENT
 DRAWING TITLE: DETAILS

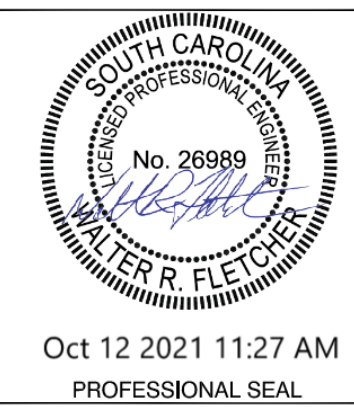
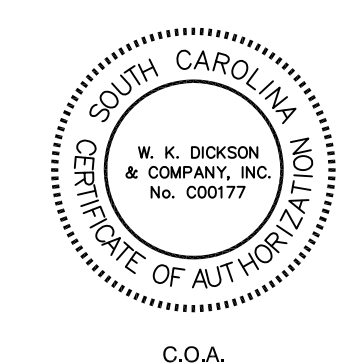
PROJ. MGR.: WRF
 DESIGN BY: WRF
 DRAWN BY: CBB
 PROJ. DATE: 10-12-2018
 DRAWING NUMBER: C501
 WKD PROJ. NO.: 20180371.00.CH

ISSUED FOR PERMITTING - NOT FOR CONSTRUCTION

CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND MATERIALS TO BE USED AT THE TIME OF CONSTRUCTION. ANY CHANGES TO THE ORIGINAL DESIGN SHALL BE APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS.



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 WWW.WKDICKSON.COM



REVISION RECORD	NO.	DATE	DESCRIPTION	WRF	BY
	A	10/02/19	100% REVIEW SET - NOT FOR CONSTRUCTION		

PROJECT NAME: MAPLE STREET FORCE MAIN RELOCATION FOR DORCHESTER COUNTY WATER AND SEWER DEPARTMENT
 DRAWING TITLE: DETAILS

PROJ. MGR.: WRF
 DESIGN BY: WRF
 DRAWN BY: CBB
 PROJ. DATE: 10-12-2018
 DRAWING NUMBER:

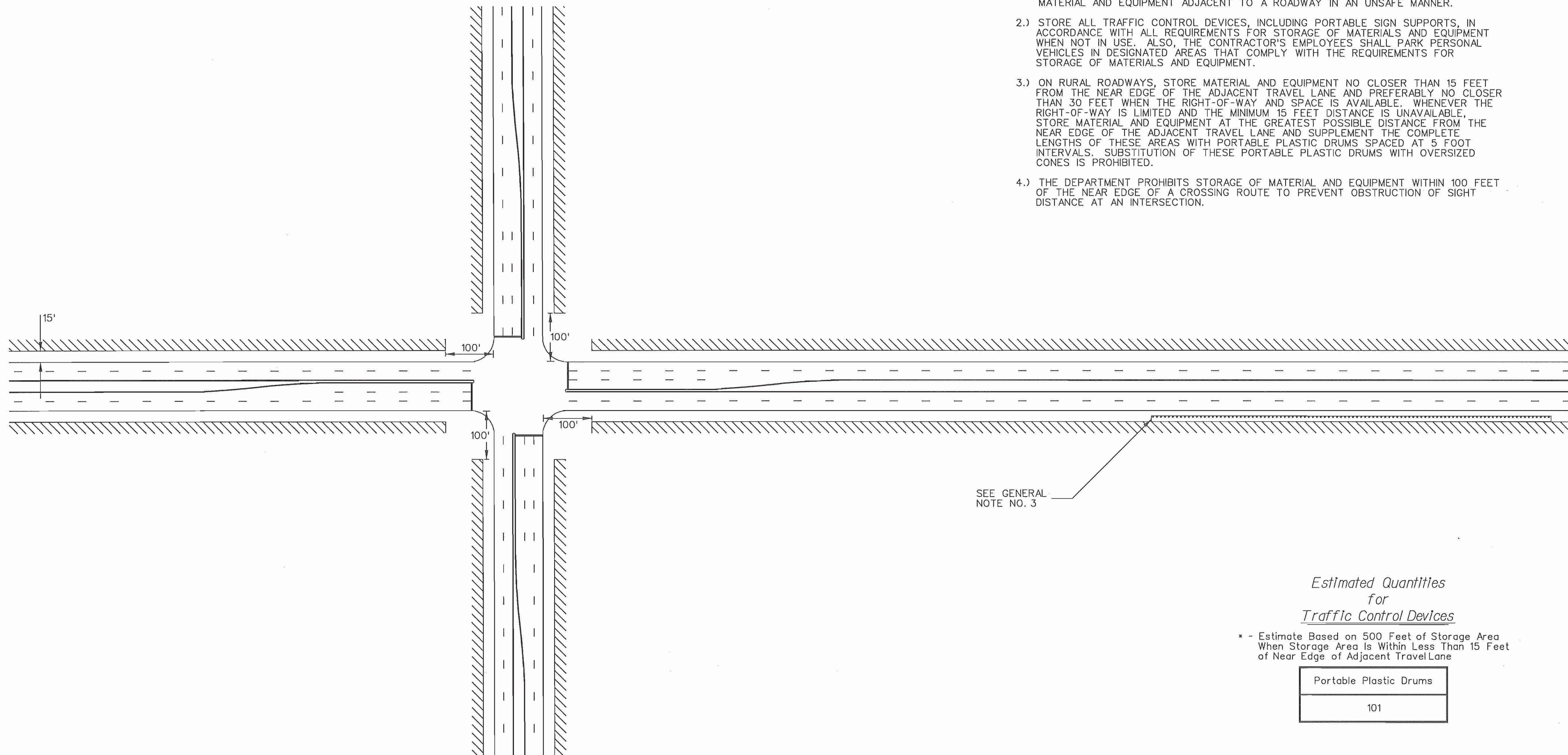
C502
 WKD PROJ. NO.: 20180371.00.CH

ISSUED FOR PERMITTING - NOT FOR CONSTRUCTION

REFERENCES

GENERAL NOTES

- 1.) STORE MATERIAL AND EQUIPMENT AT THE GREATEST POSSIBLE DISTANCE FROM THE NEAR EDGE OF THE ADJACENT TRAVEL LANE WHEN THE RIGHT-OF-WAY AND SPACE IS AVAILABLE. UTILIZE AREAS PROTECTED BY GUARDRAIL AND TEMPORARY CONCRETE BARRIER WALL WHEN AVAILABLE. THE DEPARTMENT PROHIBITS THE STORAGE OF MATERIAL AND EQUIPMENT ADJACENT TO A ROADWAY IN AN UNSAFE MANNER.
- 2.) STORE ALL TRAFFIC CONTROL DEVICES, INCLUDING PORTABLE SIGN SUPPORTS, IN ACCORDANCE WITH ALL REQUIREMENTS FOR STORAGE OF MATERIALS AND EQUIPMENT WHEN NOT IN USE. ALSO, THE CONTRACTOR'S EMPLOYEES SHALL PARK PERSONAL VEHICLES IN DESIGNATED AREAS THAT COMPLY WITH THE REQUIREMENTS FOR STORAGE OF MATERIALS AND EQUIPMENT.
- 3.) ON RURAL ROADWAYS, STORE MATERIAL AND EQUIPMENT NO CLOSER THAN 15 FEET FROM THE NEAR EDGE OF THE ADJACENT TRAVEL LANE AND PREFERABLY NO CLOSER THAN 30 FEET WHEN THE RIGHT-OF-WAY AND SPACE IS AVAILABLE. WHENEVER THE RIGHT-OF-WAY IS LIMITED AND THE MINIMUM 15 FEET DISTANCE IS UNAVAILABLE, STORE MATERIAL AND EQUIPMENT AT THE GREATEST POSSIBLE DISTANCE FROM THE NEAR EDGE OF THE ADJACENT TRAVEL LANE AND SUPPLEMENT THE COMPLETE LENGTHS OF THESE AREAS WITH PORTABLE PLASTIC DRUMS SPACED AT 5 FOOT INTERVALS. SUBSTITUTION OF THESE PORTABLE PLASTIC DRUMS WITH OVERSIZED CONES IS PROHIBITED.
- 4.) THE DEPARTMENT PROHIBITS STORAGE OF MATERIAL AND EQUIPMENT WITHIN 100 FEET OF THE NEAR EDGE OF A CROSSING ROUTE TO PREVENT OBSTRUCTION OF SIGHT DISTANCE AT AN INTERSECTION.



Estimated Quantities
for
Traffic Control Devices

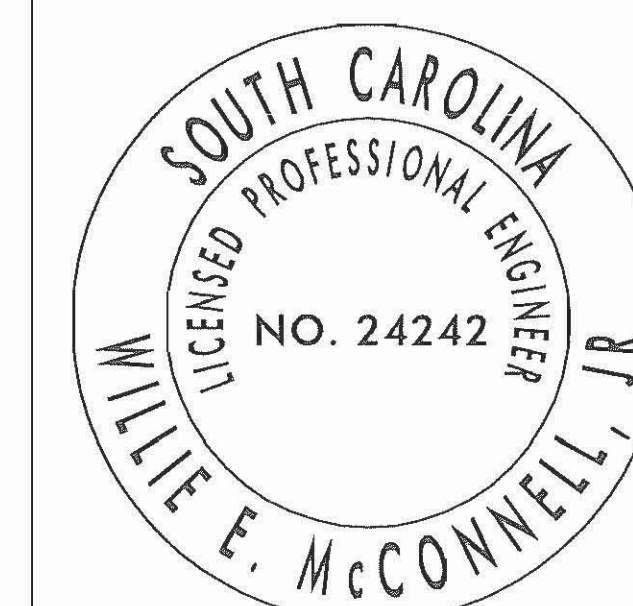
* - Estimate Based on 500 Feet of Storage Area
When Storage Area is Within Less Than 15 Feet
of Near Edge of Adjacent Travel Lane

Portable Plastic Drums
101

LEGEND

- PORTABLE PLASTIC DRUMS
- ▨ POTENTIAL STORAGE AREA

WORK ZONE TRAFFIC CONTROL ENGINEER



W. McConnell
SIGNATURE

1-30-2008
DATE

6			
5			
4			
3			
2			
1			
0	8-10-07	JCS	DRAWING NO. UPDATE
#	DATE	CHK	DESCRIPTION



SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 405
COLUMBIA, SC 29201

STANDARD DRAWING

MATERIALS STORAGE
PRIMARY
&
SECONDARY
RURAL ROADWAYS

601-110-00

EFFECTIVE LETTING DATE 1/30/08

REFERENCES

WORK ZONE TRAFFIC CONTROL ENGINEER



Willie E. McConnell, Jr.
SIGNATURE

1-30-2008
DATE

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4			
3			
2			
1			
0	8-10-07	JCS	DRAWING NO. UPDATE
#	DATE	CHK	DESCRIPTION



SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 405
COLUMBIA, SC 29201

STANDARD DRAWING

MATERIALS STORAGE
PRIMARY
&
SECONDARY
URBAN ROADWAYS

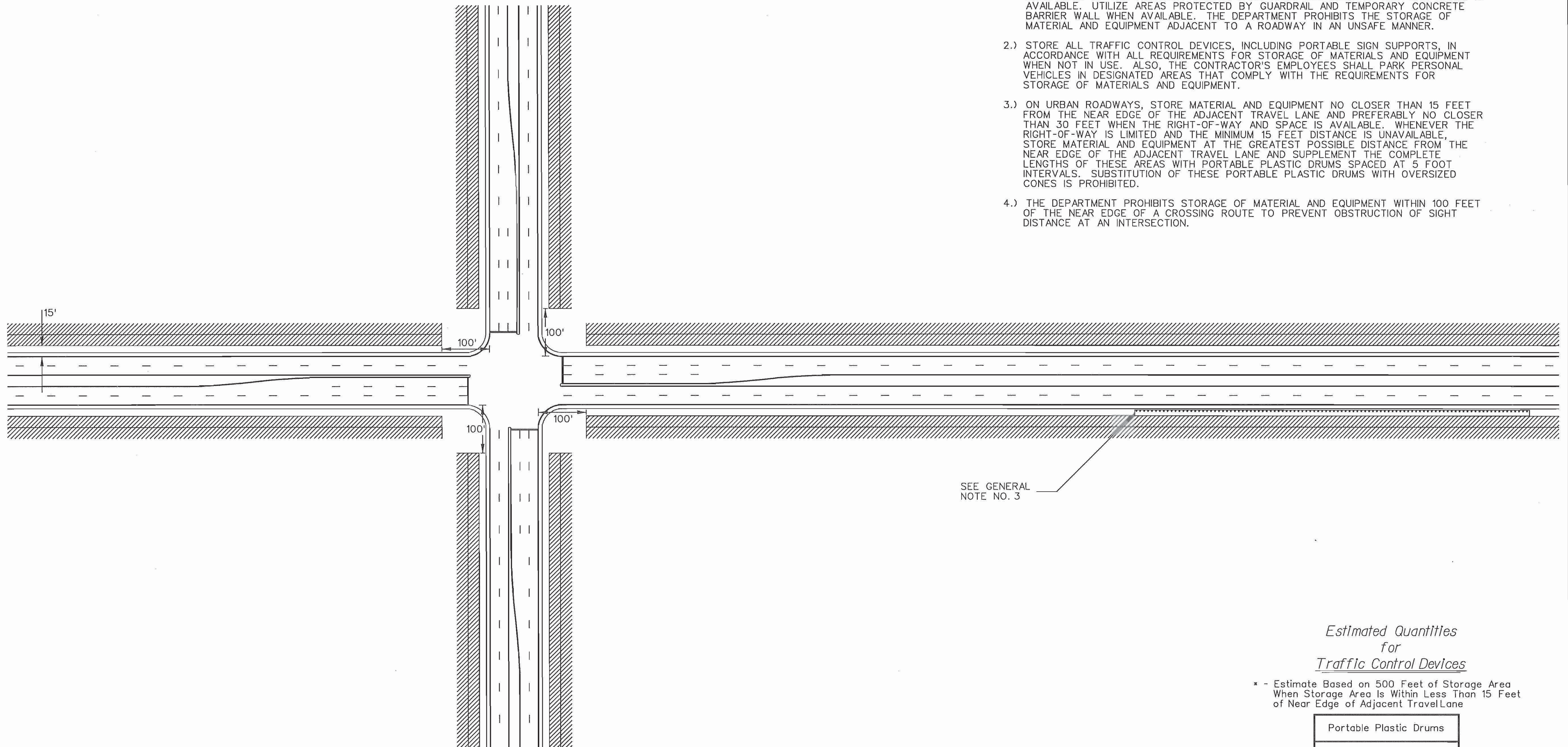
601-115-00

EFFECTIVE LETTING DATE MAY 2008

THIS DRAWING IS NOT TO SCALE

GENERAL NOTES

- 1.) STORE MATERIAL AND EQUIPMENT AT THE GREATEST POSSIBLE DISTANCE FROM THE NEAR EDGE OF THE ADJACENT TRAVEL LANE WHEN THE RIGHT-OF-WAY AND SPACE IS AVAILABLE. UTILIZE AREAS PROTECTED BY GUARDRAIL AND TEMPORARY CONCRETE BARRIER WALL WHEN AVAILABLE. THE DEPARTMENT PROHIBITS THE STORAGE OF MATERIAL AND EQUIPMENT ADJACENT TO A ROADWAY IN AN UNSAFE MANNER.
- 2.) STORE ALL TRAFFIC CONTROL DEVICES, INCLUDING PORTABLE SIGN SUPPORTS, IN ACCORDANCE WITH ALL REQUIREMENTS FOR STORAGE OF MATERIALS AND EQUIPMENT WHEN NOT IN USE. ALSO, THE CONTRACTOR'S EMPLOYEES SHALL PARK PERSONAL VEHICLES IN DESIGNATED AREAS THAT COMPLY WITH THE REQUIREMENTS FOR STORAGE OF MATERIALS AND EQUIPMENT.
- 3.) ON URBAN ROADWAYS, STORE MATERIAL AND EQUIPMENT NO CLOSER THAN 15 FEET FROM THE NEAR EDGE OF THE ADJACENT TRAVEL LANE AND PREFERABLY NO CLOSER THAN 30 FEET WHEN THE RIGHT-OF-WAY AND SPACE IS AVAILABLE. WHENEVER THE RIGHT-OF-WAY IS LIMITED AND THE MINIMUM 15 FEET DISTANCE IS UNAVAILABLE, STORE MATERIAL AND EQUIPMENT AT THE GREATEST POSSIBLE DISTANCE FROM THE NEAR EDGE OF THE ADJACENT TRAVEL LANE AND SUPPLEMENT THE COMPLETE LENGTHS OF THESE AREAS WITH PORTABLE PLASTIC DRUMS SPACED AT 5 FOOT INTERVALS. SUBSTITUTION OF THESE PORTABLE PLASTIC DRUMS WITH OVERSIZED CONES IS PROHIBITED.
- 4.) THE DEPARTMENT PROHIBITS STORAGE OF MATERIAL AND EQUIPMENT WITHIN 100 FEET OF THE NEAR EDGE OF A CROSSING ROUTE TO PREVENT OBSTRUCTION OF SIGHT DISTANCE AT AN INTERSECTION.



SEE GENERAL NOTE NO. 3

Estimated Quantities
for
Traffic Control Devices

* - Estimate Based on 500 Feet of Storage Area When Storage Area Is Within Less Than 15 Feet of Near Edge of Adjacent Travel Lane

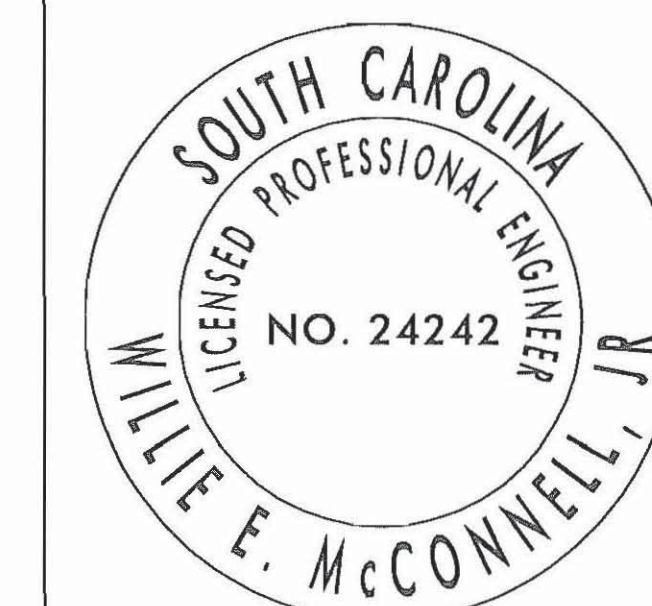
Portable Plastic Drums
101

LEGEND

- PORTABLE PLASTIC DRUMS
- ▨ POTENTIAL STORAGE AREA

REFERENCES

WORK ZONE TRAFFIC CONTROL ENGINEER



Willie E. McConnell, Jr.
SIGNATURE

1-30-2008

DATE

6			
5			
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0	8-13-07	JCS	DRAWING NO. UPDATE
#	DATE	CHK	DESCRIPTION



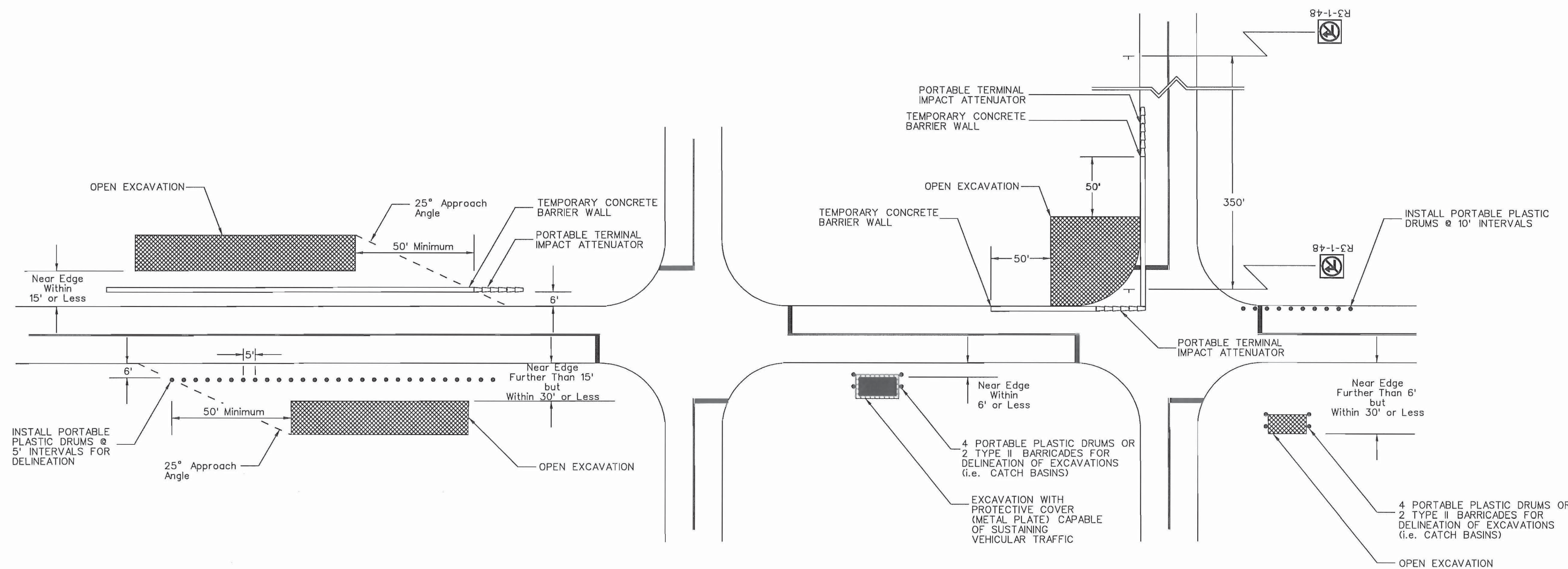
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 405
COLUMBIA, SC 29201

STANDARD DRAWING

PROTECTION OF EXCAVATIONS ADJACENT TO ROADWAY

601-205-01

EFFECTIVE LETTING DATE MAY 2008



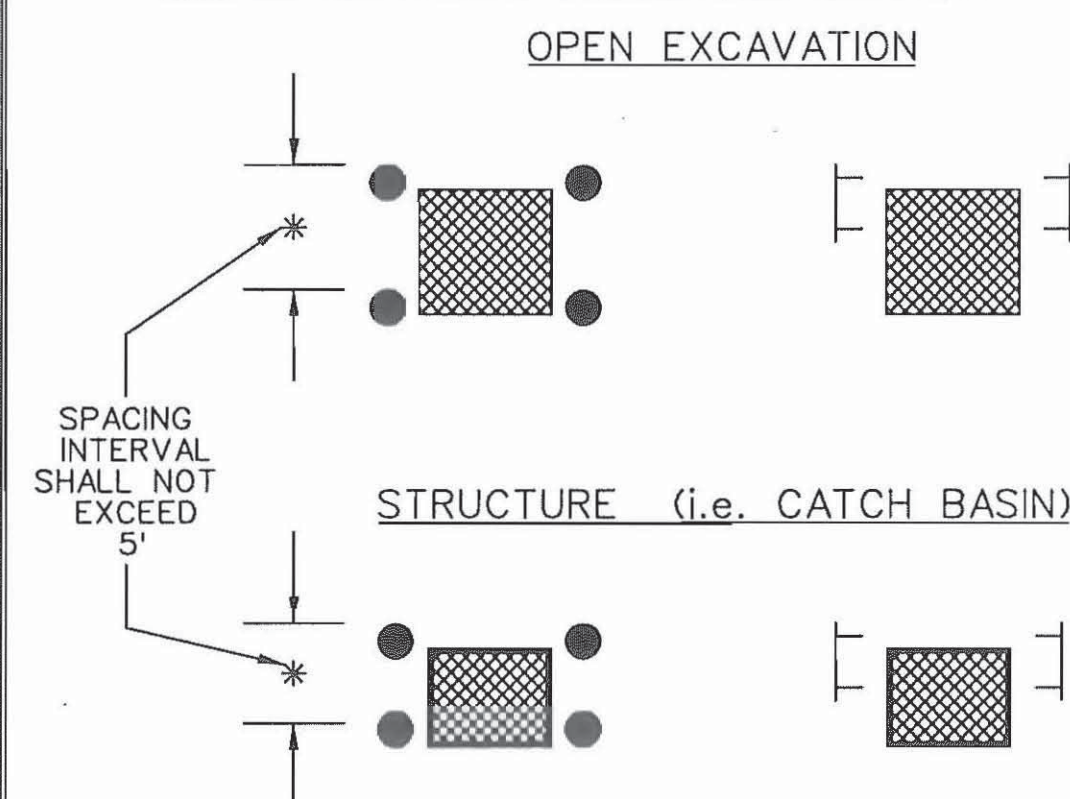
GENERAL NOTES

- 1.) CONSIDER AN EXCAVATION TO BE AN AREA CREATED BY THE REMOVAL OF MATERIAL FOR CONSTRUCTION OF A STRUCTURE (i.e. CATCH BASIN) THAT IS MORE THAN 2 INCHES BELOW THE GRADE ELEVATION OF THE SURROUNDING AREA.
- 2.) THE DEPARTMENT PROHIBITS DROP-OFFS GREATER THAN 2 INCHES ADJACENT TO TRAFFIC WHEN THE CONTRACTOR IS NOT ACTIVELY WORKING IN THE IMMEDIATE VICINITY OF THE DROP-OFF. THE CONTRACTOR SHALL PLACE AND MAINTAIN A SLOPE NO STEEPER THAN 6:1 AWAY FROM THE EDGE OF PAVEMENT ADJACENT TO A TRAVEL LANE OPEN TO TRAFFIC AT THE END OF EACH DAY'S WORK.
- 3.) DELINEATE ALL EXCAVATIONS AND STRUCTURES (i.e. CATCH BASINS OR ANY STRUCTURE THAT MAY BE AN OBSTRUCTION TO AN ERRANT VEHICLE) LOCATED WITHIN 30 FEET OF AN ADJACENT TRAVEL LANE WITH TWO OR MORE 3 FOOT WIDE TYPE II BARRICADES OR FOUR OR MORE PORTABLE PLASTIC DRUMS. MAINTAIN THESE TRAFFIC CONTROL DEVICES IN PLACE UNTIL THE EXCAVATION OR STRUCTURE IS NO LONGER CONSIDERED AN OBSTRUCTION AS DETERMINED BY THE ENGINEER. DISREGARD THIS REQUIREMENT FOR DELINEATION IF THE EXCAVATION OR STRUCTURE IS PROTECTED BY GUARDRAIL OR A TEMPORARY LONGITUDINAL BARRIER WALL SUCH AS CONCRETE OR WATER-FILLED POLYETHYLENE.
- 4.) PROVIDE PROTECTIVE COVERS (METAL PLATES CAPABLE OF SUSTAINING VEHICULAR TRAFFIC) FOR EXCAVATIONS (i.e. CATCH BASINS) LOCATED WITHIN 6 FEET OF A TRAVEL LANE. HOWEVER, IF THE EXCAVATION CANNOT BE COVERED IN ITS ENTIRETY, INSTALL A TEMPORARY LONGITUDINAL BARRIER WALL OR CLOSE THE ADJACENT TRAVEL LANE TO TRAFFIC. MAINTAIN THE TEMPORARY LONGITUDINAL BARRIER WALL OR THE LANE CLOSURE IN PLACE UNTIL THE EXCAVATION IS CLOSED AND NO LONGER CONSIDERED A POSSIBLE HAZARD AS DETERMINED BY THE ENGINEER. DISREGARD THE REQUIREMENT FOR PROTECTIVE COVERS IF THE EXCAVATION IS PROTECTED BY GUARDRAIL OR A TEMPORARY LONGITUDINAL BARRIER WALL SUCH AS CONCRETE OR WATER-FILLED POLYETHYLENE.
- 5.) DURING EXCAVATION WORK ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR LESS, EXCLUDING THE CONSTRUCTION OF CATCH BASINS AS NOTED ABOVE, MAINTAINING AN OPEN EXCAVATION WITHIN 15 FEET OF AN ADJACENT TRAVEL LANE DURING ANYTIME THE CONTRACTOR IS NOT ACTIVELY ENGAGED IN CONSTRUCTION ACTIVITIES DIRECTLY RELATED TO THE EXCAVATION IS PROHIBITED. THE CONTRACTOR SHALL EITHER CLOSE THE ADJACENT TRAVEL LANE OR INSTALL AND MAINTAIN TEMPORARY LONGITUDINAL BARRIER WALL TO PROTECT THE EXCAVATION DURING THOSE TIMES THE CONTRACTOR IS NOT ACTIVELY ENGAGED IN CONSTRUCTION ACTIVITIES DIRECTLY RELATED TO THE EXCAVATION.
- 6.) DURING EXCAVATION WORK ON ROADWAYS WITH POSTED SPEED LIMITS OF 50 MPH OR GREATER, EXCLUDING THE CONSTRUCTION OF CATCH BASINS AS NOTED ABOVE, MAINTAINING AN OPEN EXCAVATION WITHIN 30 FEET OF AN ADJACENT TRAVEL LANE DURING ANYTIME THE CONTRACTOR IS NOT ACTIVELY ENGAGED IN CONSTRUCTION ACTIVITIES DIRECTLY RELATED TO THE EXCAVATION IS PROHIBITED. THE CONTRACTOR SHALL EITHER CLOSE THE ADJACENT TRAVEL LANE OR INSTALL AND MAINTAIN TEMPORARY LONGITUDINAL BARRIER WALL TO PROTECT THE EXCAVATION DURING THOSE TIMES THE CONTRACTOR IS NOT ACTIVELY ENGAGED IN CONSTRUCTION ACTIVITIES DIRECTLY RELATED TO THE EXCAVATION.

LEGEND

- PORTABLE PLASTIC DRUMS
- ▬ PORTABLE TERMINAL IMPACT ATTENUATOR
- 1 TYPE II BARRICADES
- 3 TYPE III BARRICADES
- ▬ TEMPORARY CONCRETE BARRIER WALL
- ▨ OPEN EXCAVATION
- ▩ EXCAVATION WITH PROTECTIVE COVER (METAL PLATE)

STRUCTURE AND EXCAVATION DELINEATION



NOTE:

DO NOT BLEND PORTABLE PLASTIC DRUMS AND TYPE II BARRICADES FOR DELINEATION OF EXCAVATIONS AND STRUCTURES. UTILIZE EITHER PORTABLE PLASTIC DRUMS OR TYPE II BARRICADES THROUGHOUT THE PROJECT.

REFERENCES

FLAGGING OPERATIONS
GENERAL NOTES

(ALL NOTES, SPECIFICATIONS AND REQUIREMENTS ON THIS STANDARD DRAWING APPLY TO ALL SUBSEQUENT STANDARD DRAWINGS REGARDING FLAGGING OPERATIONS UNLESS OTHERWISE NOTED)

FLAGGING OPERATIONS -

1. KEY FEATURES RELEVANT TO FLAGGING OPERATIONS:

- APPROACH TAPER** - THIS IS A ONE-LANE TWO-WAY TAPER PLACED IN THE TRAVEL LANE WHERE THE WORK ACTIVITY TAKES PLACE. THIS TAPER PRECEDES THE BUFFER SPACE AND THE WORK ACTIVITY AREA. THE LENGTH OF THIS TAPER MAY VARY FROM 50 FEET TO 100 FEET. INSTALL AND MAINTAIN NO LESS THAN FIVE (5) TRAFFIC CONTROL DEVICES EQUALLY SPACED AT 10' TO 25' INTERVALS AS NECESSARY TO CORRESPOND WITH THE LENGTH OF THE TAPER.
- DOWNSTREAM TAPER** - THIS TAPER, PLACED IN THE TRAVEL LANE WHERE THE WORK ACTIVITY TAKES PLACE, FOLLOWS THE WORK ACTIVITY AREA AND SERVES AS THE TERMINATION AREA FOR THE CLOSURE OF THE TRAVEL LANE. THE LENGTH OF THIS TAPER MAY VARY FROM 50 FEET TO 100 FEET. INSTALL AND MAINTAIN NO LESS THAN FIVE (5) TRAFFIC CONTROL DEVICES IN THIS TAPER.
- FLAGGER STATION** - THIS IS THE SPECIFIC LOCATION OF THE FLAGGER.
- CLOSED LANE FLAGGER** - THIS FLAGGER IS STATIONED ADJACENT TO THE FIRST TRAFFIC CONTROL DEVICE IN THE APPROACH TAPER WHO CONTROLS THE TRAFFIC THAT REQUIRES RELOCATION FROM THE TRAVEL LANE BEING CLOSED TO TRAFFIC.
- OPEN LANE FLAGGER** - THIS FLAGGER IS STATIONED 100 FEET BEYOND THE LAST TRAFFIC CONTROL DEVICE IN THE DOWNSTREAM TAPER WHO CONTROLS THE TRAFFIC OPERATING IN THE TRAVEL LANE REMAINING OPEN TO TRAFFIC.
- SIDE ROAD FLAGGER** - THIS FLAGGER IS STATIONED ON AN INTERSECTING SIDE ROAD AND CONTROLS THE SIDE ROAD TRAFFIC ENTERING INTO THE ROADWAY WHERE THE WORK ACTIVITY AREA IS LOCATED.
- BUFFER SPACE** - THIS AREA IS LOCATED BETWEEN THE DOWNSTREAM END OF THE APPROACH TAPER AND THE NEAREST LIMITS OF THE WORK ACTIVITY AREA AND MAY PROVIDE SOME RECOVERY SPACE FOR AN ERRANT VEHICLE. THE PRESENCE OF PERSONNEL, TOOLS, MATERIALS, EQUIPMENT, WORK VEHICLES, ETC. WITHIN THE LIMITS OF THE BUFFER SPACE IS PROHIBITED. HOWEVER, WHEN THE MINIMUM DISTANCE REQUIREMENTS FOR THE BUFFER SPACE ARE UNAVAILABLE, A TRUCK MOUNTED ATTENUATOR MAY TEMPORARILY ENCR OACH UPON THE BUFFER SPACE IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED IN THE SECTION BELOW ENTITLED, "BUFFER SPACE", WHEN APPROVED BY THE ENGINEER.

WORK ACTIVITY AREA - PERSONNEL, MATERIALS, EQUIPMENT, WORK VEHICLES, ETC. ARE PRESENT WITHIN THIS AREA TO CONDUCT THE WORK.

LIMITS of the WORK ACTIVITY AREA - THIS IS THE BOUNDARY OF THE WORK ACTIVITY AREA FIRST ENCOUNTERED, FROM EITHER DIRECTION, BY MOTORISTS PASSING BY THE WORK ACTIVITY AREA IN THE ADJACENT TRAVEL LANE OPEN TO TRAFFIC AND CONTROLLED BY THE FLAGGERS.

APPROACH LANE - TRAFFIC APPROACHES AN INTERSECTION OR A SPECIFIC LOCATION IN THIS TRAVEL LANE.

DEPARTURE LANE - TRAFFIC DEPARTS FROM AN INTERSECTION OR A SPECIFIC LOCATION IN THIS TRAVEL LANE.

MAINLINE APPROACH - THIS IS AN APPROACH TO THE WORK ACTIVITY AREA ON THE ROADWAY WHERE THE WORK ACTIVITY AREA IS LOCATED.

SIDE ROADS - THESE ROADS INTERSECT THE ROADWAY ON WHICH THE WORK ACTIVITY AREA IS LOCATED.

LIMITS of the INTERSECTION - THE LIMITS OF OR THE PHYSICAL AREA WITHIN AN INTERSECTION IS DEFINED BY THE LOCATION OF STOP BARS WHEN PRESENT, WHEN STOP BARS ARE ABSENT, THE LIMITS OF OR THE PHYSICAL AREA WITHIN AN INTERSECTION IS DEFINED BY THE LOCATION POINTS WHERE THE CORNER RADII BETWEEN ADJACENT ROADWAY APPROACHES TIE TO THE EDGE OF PAVEMENT OR THE EDGE OF TRAVEL LANE ADJACENT TO THE EDGE OF PAVEMENT OF EACH ROADWAY.

2. INSTALL, CONDUCT AND MAINTAIN FLAGGING OPERATIONS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, THE STANDARD DRAWINGS, THE MUTCD AND THE "SOUTH CAROLINA FLAGGER'S HANDBOOK" UNLESS OTHERWISE DIRECTED BY THE DEPARTMENT. INSTALL ALL SIGNS RELATIVE TO A FLAGGING OPERATION PRIOR TO INITIATION OF THE OPERATION AND REMOVE OR COVER ALL SIGNS IMMEDIATELY UPON TERMINATION OF THE OPERATION. EQUIP EACH FLAGGER WITH A 24" x 24" STOP/SLOW PADDLE MOUNTED ON A RIGID HANDLE WITH A MINIMUM LENGTH OF 7 FEET. THE DEPARTMENT PROHIBITS THE USE OF FLAGS EXCEPT DURING EMERGENCY SITUATIONS.
3. LANE CLOSURES FOR FLAGGING OPERATIONS ARE RESTRICTED TO A MAXIMUM DISTANCE OF 2 MILES UNLESS OTHERWISE APPROVED BY THE ENGINEER. THE WORK LIMITS WILL COMPLY WITH THE CONTRACT AND SHALL REQUIRE THE ENGINEER'S APPROVAL PRIOR TO BEGINNING THE WORK.
4. INSTALL AND MAINTAIN THE PROPER ARRAY OF ADVANCE WARNING SIGNS FOR EACH "MAINLINE APPROACH" WHEN A FLAGGING OPERATION IS IN PLACE AND ACTIVE. WHEN NECESSARY TO RELOCATE THE "FLAGGER STATION" WHILE ACTIVELY MAINTAINING THE FLAGGING OPERATION, INSTALL AN ADDITIONAL ARRAY OF ADVANCE WARNING SIGNS AT THE LOCATION RELATIVE TO THE NEW "FLAGGER STATION" AND REMOVE THE ORIGINAL ARRAY OF ADVANCE WARNING SIGNS IMMEDIATELY UPON COMPLETION OF THE RELOCATION OF THE FLAGGER TO THE NEW "FLAGGER STATION".
5. INSTALL ALL ADVANCE WARNING SIGNS IMMEDIATELY PRIOR TO INITIATING A FLAGGING OPERATION AND REMOVE OR COVER ALL SIGNS IMMEDIATELY UPON TERMINATION OF THE OPERATION.
6. MAINTAIN TWO-WAY RADIO COMMUNICATIONS BETWEEN ALL FLAGGERS.

NIGHTTIME FLAGGING OPERATIONS -

1. EACH FLAGGER SHALL WEAR SAFETY APPAREL IN COMPLIANCE WITH THE REQUIREMENTS OF ANSI/ ISEA 107 STANDARD PERFORMANCE FOR CLASS 3 RISK EXPOSURE, LATEST REVISION, WHEN CONDUCTING NIGHTTIME FLAGGING OPERATIONS.
2. ILLUMINATE EACH "FLAGGER STATION" WITH ANY COMBINATION OF PORTABLE LIGHTS, STANDARD ELECTRIC LIGHTS, EXISTING STREET LIGHTS, ETC. THAT WILL PROVIDE A MINIMUM ILLUMINATION LEVEL OF 108 lx OR 10 fc WHEN CONDUCTING NIGHTTIME FLAGGING OPERATIONS.
3. SUPPLEMENT EACH ARRAY OF ADVANCE WARNING SIGNS ON EACH "MAINLINE APPROACH" WITH A TRAILER MOUNTED CHANGEABLE MESSAGE SIGN. THESE CHANGEABLE MESSAGE SIGNS ARE NOT REQUIRED ON THE "SIDE ROADS" INTERSECTING THE ROADWAY WHERE THE "WORK ACTIVITY AREA" IS LOCATED. ALSO, THESE CHANGEABLE MESSAGE SIGNS ARE NOT REQUIRED DURING DAYTIME FLAGGING OPERATIONS UNLESS OTHERWISE DIRECTED BY THE STANDARD DRAWINGS. INSTALL THE CHANGEABLE MESSAGE SIGNS IN ADVANCE OF THE ADVANCE WARNING SIGN ARRAYS. THE MESSAGES SHOULD BE "PREPARE TO STOP", "FLAGGER AHEAD". A TRUCK MOUNTED CHANGEABLE MESSAGE SIGN IS NOT AN ACCEPTABLE ALTERNATIVE TO A TRAILER MOUNTED CHANGEABLE MESSAGE SIGN DURING NIGHTTIME FLAGGING OPERATIONS.
4. UTILIZE PORTABLE PLASTIC DRUMS OR 42" OVERSIZED TRAFFIC CONES IN PLACE OF 36" STANDARD TRAFFIC CONES DURING NIGHTTIME FLAGGING OPERATIONS.

BUFFER SPACE -

1. THE MINIMUM DISTANCE REQUIREMENTS FOR THE "BUFFER SPACE" ARE BASED UPON THE LEGAL POSTED REGULATORY SPEED LIMIT OF THE ROADWAY PRIOR TO BEGINNING THE WORK.

SPEED LIMIT	DISTANCES
LOW SPEED ≤ 35 MPH	200 FEET
INTERMEDIATE SPEED 40 - 50 MPH	300 FEET
HIGH SPEED 55 MPH	400 FEET

2. THE PRESENCE OF PERSONNEL, TOOLS, MATERIALS, EQUIPMENT, WORK VEHICLES, ETC. WITHIN THE LIMITS OF THE "BUFFER SPACE" IS PROHIBITED. A TRUCK MOUNTED ATTENUATOR IS THE ONLY WORK VEHICLE THAT MAY TEMPORARILY ENCR OACH UPON THE "BUFFER SPACE" IN ACCORDANCE WITH THE CONDITIONS SPECIFIED IN THE FOLLOWING NOTE WHEN APPROVED BY THE ENGINEER. SEE NOTE NO.3.
3. WHEN THE MINIMUM DISTANCE REQUIREMENTS FOR THE "BUFFER SPACE" ARE UNAVAILABLE DUE TO FIELD CONDITIONS, IT MAY BE NECESSARY FOR A TRUCK MOUNTED ATTENUATOR TO TEMPORARILY ENCR OACH UPON THE "BUFFER SPACE" WHEN APPROVED BY THE ENGINEER. A TRUCK MOUNTED ATTENUATOR IS THE ONLY VEHICLE PERMITTED TO TEMPORARILY ENCR OACH UPON THE "BUFFER SPACE" AND THIS ENCR OACHMENT IS ONLY PERMITTED WHEN ALL REASONABLE OPTIONS TO AVOID DOING SO HAVE BEEN EXHAUSTED. WHEN ENCR OACHMENT UPON THE "BUFFER SPACE" IS APPROVED BY THE ENGINEER, MINIMIZE THE TIME DURATION OF THE ENCR OACHMENT BY REMOVAL OF THE TRUCK MOUNTED ATTENUATOR FROM THE "BUFFER SPACE" AT THE FIRST OPPORTUNITY THE MINIMUM DISTANCE REQUIREMENTS FOR THE "BUFFER SPACE" BECOME AVAILABLE.

SIGNS AND TRAFFIC CONTROL DEVICES -

1. MEASURE THE ADVANCE WARNING SIGN LOCATIONS FOR EACH APPROACH FROM THE "FLAGGER STATION" LOCATED ON THAT APPROACH.
2. INSTALL THE ADVANCE WARNING SIGNS AS SPACING INTERVALS BASED UPON THE POSTED REGULATORY SPEED LIMIT OF THE ROADWAY PRIOR TO BEGINNING ANY WORK. THE ADVANCE WARNING SIGN SPACING INTERVALS INDICATED ARE FOR NORMAL CONDITIONS. ADJUSTMENTS TO THESE DISTANCES MAY BE NECESSARY DUE TO EXISTING SIGNS, INTERSECTING ROADWAYS, HORIZONTAL AND/OR VERTICAL ALIGNMENTS OR OTHER SIGHT DISTANCE RESTRICTIONS. SEE TABLE A.
3. INSTALL ADVANCE WARNING SIGNS MOUNTED ON PORTABLE SIGN SUPPORTS NO LESS THAN 4 FEET FROM THE NEAR EDGE OF THE SIGN TO THE NEAR EDGE OF AN ADJACENT TRAVEL LANE ON ROADWAYS WITH EARTH SHOULDERS AND NO LESS THAN 6 FEET FROM THE NEAR EDGE OF THE SIGN TO THE NEAR EDGE OF AN ADJACENT TRAVEL LANE ON ROADWAYS WITH PAVED SHOULDERS. WHEN CURB & CUTTER IS PRESENT, INSTALL THE SIGN NO LESS THAN 2 FEET FROM THE NEAR EDGE OF THE SIGN TO THE FACE OF THE CURB.
4. ALL SIGNS MOUNTED ON PORTABLE SIGN SUPPORTS SHALL HAVE A MINIMUM MOUNTING HEIGHT OF 5 FEET FROM THE GROUND TO THE BOTTOM OF THE SIGN. ALL SIGNS MOUNTED ON GROUND MOUNTED U-CHANNEL OR SQUARE STEEL TUBE POSTS SHALL HAVE A MINIMUM MOUNTING HEIGHT OF 7 FEET FROM THE GRADE ELEVATION OF THE NEAR EDGE OF THE ADJACENT TRAVEL LANE TO THE BOTTOM OF THE SIGN UNLESS OTHERWISE DIRECTED BY THE DEPARTMENT. MOUNT ALL SIGNS STRAIGHT AND LEVEL AND WITH THE FACE OF THE SIGNS PERPENDICULAR TO THE SURFACE OF THE ROADWAY.
5. REFLECTORIZE ORANGE ADVANCE WARNING SIGNS AND ANY ORANGE AREAS OF A MULTI-COLORED ADVANCE WARNING SIGN WITH A FLUORESCENT ORANGE COLORED PRISMATIC RETROREFLECTIVE SHEETING. REFLECTORIZE WHITE REGULATORY SIGNS AND ANY WHITE AREAS OF A MULTI-COLORED ADVANCE WARNING SIGN WITH A WHITE COLORED PRISMATIC RETROREFLECTIVE SHEETING.
6. ALL TRAFFIC CONTROL DEVICES SHALL COMPLY WITH THE REQUIREMENTS OF NCHRP REPORT 350 OR THE AASHTO MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) AND SHALL REQUIRE APPROVAL BY THE DEPARTMENT. ONLY THOSE TRAFFIC CONTROL DEVICES INCLUDED ON THE "APPROVED PRODUCTS LIST FOR TRAFFIC CONTROL DEVICES IN WORK ZONES" ARE CONSIDERED ACCEPTABLE FOR USE. THIS LIST MAY BE ACCESSED ON THE DEPARTMENT'S WEB SITE AT: www.scdot.org
7. REFLECTORIZATION OF 36" TRAFFIC CONES USED DURING DAYLIGHT HOURS IS NOT REQUIRED. IN THE EVENT A DAYTIME FLAGGING OPERATION EXTENDS INTO THE NIGHTTIME HOURS, REPLACE ALL 36" TRAFFIC CONES WITH EITHER PORTABLE PLASTIC DRUMS OR 42" OVERSIZED TRAFFIC CONES. REFLECTORIZE ALL PORTABLE PLASTIC DRUMS AND 42" OVERSIZED TRAFFIC CONES WITH TYPE III OR GREATER FLEXIBLE MICROPRISMATIC RETROREFLECTIVE SHEETING UNLESS OTHERWISE DIRECTED BY THE DEPARTMENT.
8. DELINEATE THE TANGENT AREA OF THE LANE CLOSURE WITH THE NECESSARY TRAFFIC CONTROL DEVICES TO MINIMIZE ENCR OACHMENT BY MOTORISTS INTO THE CLOSED TRAVEL LANE UNLESS OTHERWISE DIRECTED BY THE ENGINEER. ON ROADWAYS WITH POSTED REGULATORY SPEED LIMITS OF 35 MPH OR LESS, INSTALL THE TRAFFIC CONTROL DEVICES AT SPACING INTERVALS OF 25 FEET. ON ROADWAYS WITH POSTED REGULATORY SPEED LIMITS OF 40 MPH OR GREATER, INSTALL THE TRAFFIC CONTROL DEVICES AT SPACING INTERVALS OF 50 FEET. SEE TABLE B.

ADVANCE WARNING ARROW PANEL -

1. DURING FLAGGING OPERATIONS, AN ADVANCE WARNING ARROW PANEL SHALL OPERATE IN THE "FOUR CORNERS" CAUTION MODE WHEN LOCATED WITHIN OR IN BETWEEN THE LIMITS OF THE ADVANCE WARNING SIGN ARRAYS SPECIFIC TO A FLAGGING OPERATION. OPERATION OF AN ADVANCE WARNING ARROW PANEL IN AN ARROW, CHEVRON OR ANY OTHER TYPE OF CAUTION MODE OTHER THAN THE "FOUR CORNERS" CAUTION MODE WHEN LOCATED WITHIN OR IN BETWEEN THE LIMITS OF THE ADVANCE WARNING SIGN ARRAYS AS SPECIFIED HEREINBEFORE IS PROHIBITED.
2. ALL ADVANCE WARNING ARROW PANELS SHALL COMPLY WITH THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, LATEST EDITION. THE SPECIFIC LOCATION OF AN ADVANCE WARNING ARROW PANEL MAY REQUIRE ADJUSTMENTS DUE TO HORIZONTAL AND/OR VERTICAL ALIGNMENT OR OTHER SIGHT DISTANCE RESTRICTIONS.

TRUCK MOUNTED ATTENUATOR -

1. A TRUCK MOUNTED ATTENUATOR IS OPTIONAL. UTILIZATION OF A TRUCK MOUNTED ATTENUATOR SHOULD BE CONSIDERED WHEN THE MINIMUM DISTANCE REQUIREMENTS FOR THE "BUFFER SPACE" ARE UNAVAILABLE DUE TO FIELD CONDITIONS. HOWEVER, A TRAILER MOUNTED ADVANCE WARNING ARROW PANEL MAY BE UTILIZED IN PLACE OF A TRUCK MOUNTED ATTENUATOR DURING TRAFFIC CONTROL SETUPS FOR WORK ACTIVITIES SUCH AS ASPHALT CONCRETE PLACEMENT OPERATIONS WHEN APPROVED BY THE ENGINEER.
2. WHEN UTILIZING A TRUCK MOUNTED ATTENUATOR, ENSURE THE TRUCK HAS THE CORRECT GROSS VEHICULAR WEIGHT (GVW) REQUIRED FOR THE TYPE OF TRUCK MOUNTED ATTENUATOR BEING UTILIZED. A DIRECT TRUCK MOUNTED TRUCK MOUNTED ATTENUATOR, A UNIT MOUNTED AND ATTACHED TO BRACKETS OR SIMILAR DEVICES CONNECTED TO THE FRAME OF THE TRUCK, REQUIRES A TRUCK WITH A MINIMUM GVW OF 15,000 POUNDS (ACTUAL WEIGHT) UNLESS OTHERWISE DIRECTED BY THE DEPARTMENT. A TRAILER TOWED TRUCK MOUNTED ATTENUATOR, A TRAILER TYPE UNIT TOWED FROM BEHIND AND ATTACHED TO THE FRAME OF THE TRUCK VIA A PINTLE HOOK / HITCH, REQUIRES A TRUCK WITH A MINIMUM GVW OF 10,000 POUNDS (ACTUAL WEIGHT) UNLESS OTHERWISE DIRECTED BY THE DEPARTMENT. IF THE ADDITION OF SUPPLEMENTAL WEIGHT TO THE VEHICLE AS BALLAST IS NECESSARY, CONTAIN THE MATERIAL WITHIN A STRUCTURE CONSTRUCTED OF STEEL. CONSTRUCT THIS STEEL STRUCTURE TO HAVE A MINIMUM OF FOUR (4) SIDES AND A BOTTOM. A TOP IS OPTIONAL. BOLT THIS STRUCTURE TO THE FRAME OF THE TRUCK. UTILIZE A SUFFICIENT NUMBER OF FASTENERS FOR ATTACHMENT OF THE STEEL STRUCTURE TO THE FRAME OF THE TRUCK TO ENSURE THE STRUCTURE WILL NOT SEPARATE FROM THE FRAME OF THE TRUCK DURING AN IMPACT UPON THE TRUCK MOUNTED ATTENUATOR. UTILIZE EITHER DRY LOOSE SAND OR STEEL REINFORCED CONCRETE FOR BALLAST MATERIAL WITHIN THE STEEL STRUCTURE TO ACHIEVE THE NECESSARY WEIGHT. THE BALLAST MATERIAL SHALL REMAIN CONTAINED WITHIN THE CONFINES OF THE STEEL STRUCTURE IN ITS ENTIRETY AND SHALL NOT PROTRUDE FROM THE STEEL STRUCTURE IN ANY MANNER.
3. LOCATE THE TRUCK MOUNTED ATTENUATOR APPROXIMATELY 100 FEET IN ADVANCE OF THE "WORK ACTIVITY AREA" UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
4. PROVIDE, INSTALL AND MAINTAIN THE TRUCK MOUNTED ATTENUATOR AS SPECIFIED BY THE STANDARD SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER.

GENERAL -

1. CONDUCT THE WORK IN SUCH A MANNER SO AS NOT TO ENCR OACH ONTO THE ADJACENT TRAVEL LANE OPEN TO TRAFFIC. INSTALL, MAINTAIN AND ADJUST THE TRAFFIC CONTROL DEVICES AS NECESSARY TO ENSURE PROPER DELINEATION OF THE WORK AREA.
2. IF WORK IS BEING CONDUCTED AT TWO DIFFERENT LOCATIONS AT THE SAME TIME, SEPARATE THE TWO LOCATIONS BY NO LESS THAN 2 MILES FROM THE LAST TRAFFIC CONTROL DEVICE IN THE "DOWNSTREAM TAPER" OF THE FIRST LANE CLOSURE TO THE FIRST TRAFFIC CONTROL DEVICE IN THE "APPROACH TAPER" OF THE SECOND LANE CLOSURE ENCOUNTERED BY A MOTORIST UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
3. THE DEPARTMENT RESERVES THE RIGHT TO RESTRICT WORK OPERATIONS AND/OR WITHHOLD THE MONTHLY ESTIMATE IF THE TRAFFIC CONTROL IS NOT PROPERLY INSTALLED AND MAINTAINED AS DIRECTED BY THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, THE STANDARD DRAWINGS, THE PLANS AND/OR THE ENGINEER.

TABLE A

SIGN PLACEMENT INTERVALS	
SPEED LIMIT	*
≤ 35 MPH LOW SPEED	200
40 - 50 MPH INTERMEDIATE SPEED	350
55 MPH HIGH SPEED	500

* REGULATORY POSTED SPEED LIMIT PRIOR TO BEGINNING WORK

TABLE B

TRAFFIC CONTROL DEVICE SPACING INTERVALS WORK ACTIVITY / BUFFER SPACE AREAS	
SPEED LIMIT	SPACING INTERVALS
≤ 35 MPH	25 FEET
40 - 55 MPH	50 FEET

WORK ZONE TRAFFIC
CONTROL ENGINEER



Willie E. McConnell, Jr.
SIGNATURE

6/1/2018
DATE

5			
4			
3			
2			
1	4-27-18	WEM	REVISED FLAGGING OPERATIONS NOTE 1
0	1-14-15	JCS	NEW DRAWING
#	DATE	CHK	DESCRIPTION



SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 405
COLUMBIA, SC 29201

STANDARD DRAWING

FLAGGING OPERATIONS
TWO-LANE TWO-WAY
PRIMARY &
SECONDARY ROUTES

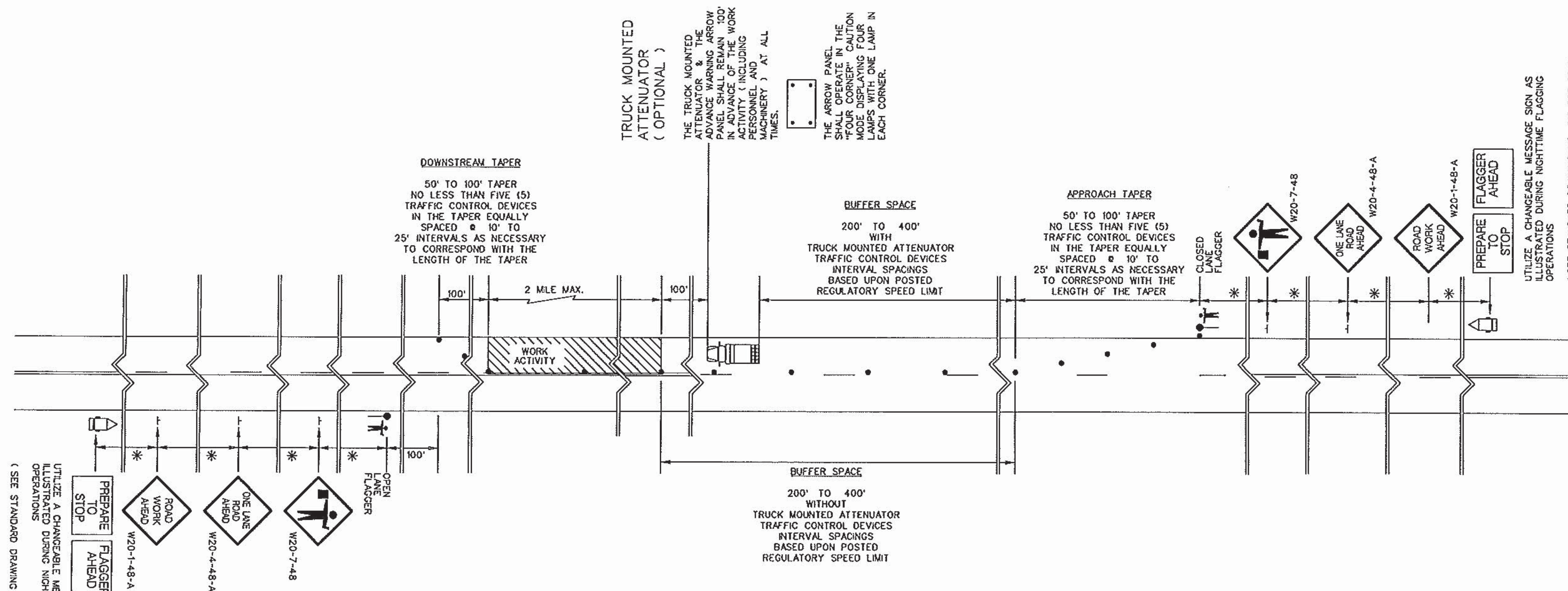
610-005-00

EFFECTIVE LETTING DATE JAN 2019

THIS DRAWING IS NOT TO SCALE

DRAWING 610-005-10 NOTES

1. SEE STANDARD DRAWING NO. 610-005-00 FOR ALL GENERAL NOTES AND REQUIREMENTS.



UTILIZE A CHANGEABLE MESSAGE SIGN AS ILLUSTRATED DURING NIGHTTIME FLAGGING OPERATIONS
(SEE STANDARD DRAWING NO. 610-005-00)

TABLE A

SIGN PLACEMENT INTERVALS	
SPEED LIMIT	*
# < 35 MPH LOW SPEED	200
# 40 - 50 MPH INTERMEDIATE SPEED	350
# 55 MPH HIGH SPEED	500

* REGULATORY POSTED SPEED LIMIT PRIOR TO BEGINNING WORK

TABLE B

TRAFFIC CONTROL DEVICE SPACING INTERVALS WORK ACTIVITY / BUFFER SPACE AREAS	
SPEED LIMIT	SPACING INTERVALS
< 35 MPH	25 FEET
40 - 55 MPH	50 FEET

TRUCK MOUNTED ATTENUATOR (OPTIONAL)
THE TRUCK MOUNTED ATTENUATOR & THE ADVANCE WARNING ARROW PANEL SHALL REMAIN 100' IN ADVANCE OF THE WORK ACTIVITY (INCLUDING PERSONNEL AND MACHINERY) AT ALL TIMES.

THE ARROW PANEL SHALL OPERATE IN THE "FOUR CORNER" CAUTION MODE DISPLAYING FOUR LAMPS WITH ONE LAMP IN EACH CORNER.

UTILIZE A CHANGEABLE MESSAGE SIGN AS ILLUSTRATED DURING NIGHTTIME FLAGGING OPERATIONS
(SEE STANDARD DRAWING NO. 610-005-00)

REFERENCES

WORK ZONE TRAFFIC CONTROL ENGINEER



Willie E. McConnell, Jr.
SIGNATURE
7/27/15
DATE

6			
5			
4			
3			
2			
1			
0	1-15-15	JCS	NEW DRAWING
#	DATE	CHK	DESCRIPTION

SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 405
COLUMBIA, SC 29201

STANDARD DRAWING

FLAGGING OPERATIONS
TWO-LANE TWO-WAY ROADWAYS WITHOUT INTERSECTIONS

610-005-10
EFFECTIVE LETTING DATE | JAN 2016

REFERENCES

DRAWING 610-005-20 NOTES

- SEE STANDARD DRAWING NO. 610-005-00 FOR ALL GENERAL NOTES AND REQUIREMENTS. THE FOLLOWING NOTES ARE SPECIFIC REQUIREMENTS FOR THIS STANDARD DRAWING.
- WHEN THE WORK ZONE PROCEEDS THROUGH OR MUST ENCROACH UPON THE "LIMITS OF THE INTERSECTION", DO NOT ALLOW THE "APPROACH TAPER" OR THE "DOWNSTREAM TAPER" OF THE LANE CLOSURE TO ENCROACH UPON THE "LIMITS OF THE INTERSECTION". ONLY THE "BUFFER SPACE" OR THE "WORK ACTIVITY AREA" OF THE LANE CLOSURE MAY ENCROACH UPON THE "LIMITS OF THE INTERSECTION".
- WHEN THE WORK ZONE PROCEEDS THROUGH OR MUST ENCROACH UPON THE "LIMITS OF THE INTERSECTION" WITH "STOP SIGN CONTROLLED" "SIDE ROADS", UTILIZE FLAGGERS TO CONTROL THE TRAFFIC FROM THE INTERSECTING "SIDE ROADS" UNLESS OTHERWISE DIRECTED BY THE ENGINEER. MAINTAIN THESE FLAGGERS IN PLACE FOR THE DURATION THAT ANY PORTION OF THE "BUFFER SPACE" OR THE "WORK ACTIVITY AREA" MAY ENCROACH UPON THE "LIMITS OF THE INTERSECTION".
- WHEN THE WORK ZONE PROCEEDS THROUGH OR MUST ENCROACH UPON THE "LIMITS OF THE INTERSECTION" WITH "STOP SIGN CONTROLLED" "SIDE ROADS", THE CONTRACTOR SHOULD CONTINUE THE WORK OPERATIONS THROUGH THE INTERSECTION TO A LOCATION POINT BEYOND THE "LIMITS OF THE INTERSECTION" THAT WILL PERMIT THE WORK TRAIN TO CLEAR THE INTERSECTION AND THE LOCATION OF THE SUBSEQUENT "FLAGGER STATION" BE NO LESS THAN 200' PAST THE "LIMITS OF THE INTERSECTION" UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- WHEN THE WORK ZONE PROCEEDS THROUGH A "STOP SIGN CONTROLLED" "SIDE ROAD" INTERSECTION, CONTINUE THE WORK OPERATIONS THROUGH THE INTERSECTION TO A SPECIFIC LOCATION POINT WITHIN THE "DEPARTURE LANE" NO LESS THAN 300 FT TO 500 FT BEYOND THE LIMITS OF THE INTERSECTION TO ALLOW THE WORK TRAIN AND ALL PORTIONS OF THE LANE CLOSURE TO CLEAR THE INTERSECTION.
- MAINTAIN THE MAXIMUM TIME DURATION OF 5 TO 7 1/2 MINUTES FOR STOPPED TRAFFIC ON THE ROADWAY WHERE THE WORK ACTIVITY IS LOCATED AND BEING CONDUCTED UNLESS OTHERWISE DIRECTED BY THE ENGINEER. WHEN ANY PORTION OF THE "WORK ACTIVITY AREA" ENCROACHES UPON THE "LIMITS OF THE INTERSECTION", VARIOUS TYPES OF WORK MAY REQUIRE TRAFFIC TO AND FROM THE "SIDE ROADS" BE STOPPED FOR TIME DURATIONS GREATER THAN THE MAXIMUM TIME DURATION OF 5 TO 7 1/2 MINUTES. ONLY WHEN APPROVED BY THE ENGINEER MAY THE MAXIMUM TIME DURATION OF 5 TO 7 1/2 MINUTES FOR STOPPED TRAFFIC FOR THE SIDE ROAD TRAFFIC BE EXCEEDED. IN THE EVENT THE TYPE OF WORK REQUIRES THE SIDE ROAD TRAFFIC BE STOPPED FOR TIME DURATIONS GREATER THAN 5 TO 7 1/2 MINUTES, THE SIDE ROAD TRAFFIC MAY BE STOPPED FOR TIME PERIODS UP TO 20 MINUTES IF APPROVED BY THE ENGINEER. IF THE SIDE ROAD TRAFFIC MUST BE STOPPED FOR TIME PERIODS GREATER THAN 20 MINUTES, CLOSURE OF THE "SIDE ROADS" MAY BE CONSIDERED IF APPROVED BY THE ENGINEER. IN THE EVENT CLOSURE OF THE "SIDE ROADS" IS APPROVED, CLOSE THE "SIDE ROADS" TO TRAFFIC IN ACCORDANCE WITH THE REQUIREMENTS OF STANDARD DRAWING NO. 610-510-00. INSTALL AND MAINTAIN APPROPRIATE DETOURS WHEN NECESSARY AND AS DIRECTED BY THE ENGINEER.

WORK ZONE TRAFFIC CONTROL ENGINEER



Willie E. McConnell, Jr.
SIGNATURE
6/1/2018
DATE

5			
4			
3			
2			
1	4-27-18	WEM	REVISED WORK ACTIVITY DIMENSION AND NOTE 5
0	1-15-15	JCS	NEW DRAWING
#	DATE	CHK	DESCRIPTION

SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 405
COLUMBIA, SC 29201

STANDARD DRAWING
FLAGGING OPERATIONS
WORK ZONES
CONTINUING THROUGH
STOP SIGN CONTROLLED
SIDE ROADS

610-005-20

EFFECTIVE LETTING DATE JAN 2019

(SEE STANDARD DRAWING NO. 610-005-00)

THIS DRAWING IS NOT TO SCALE

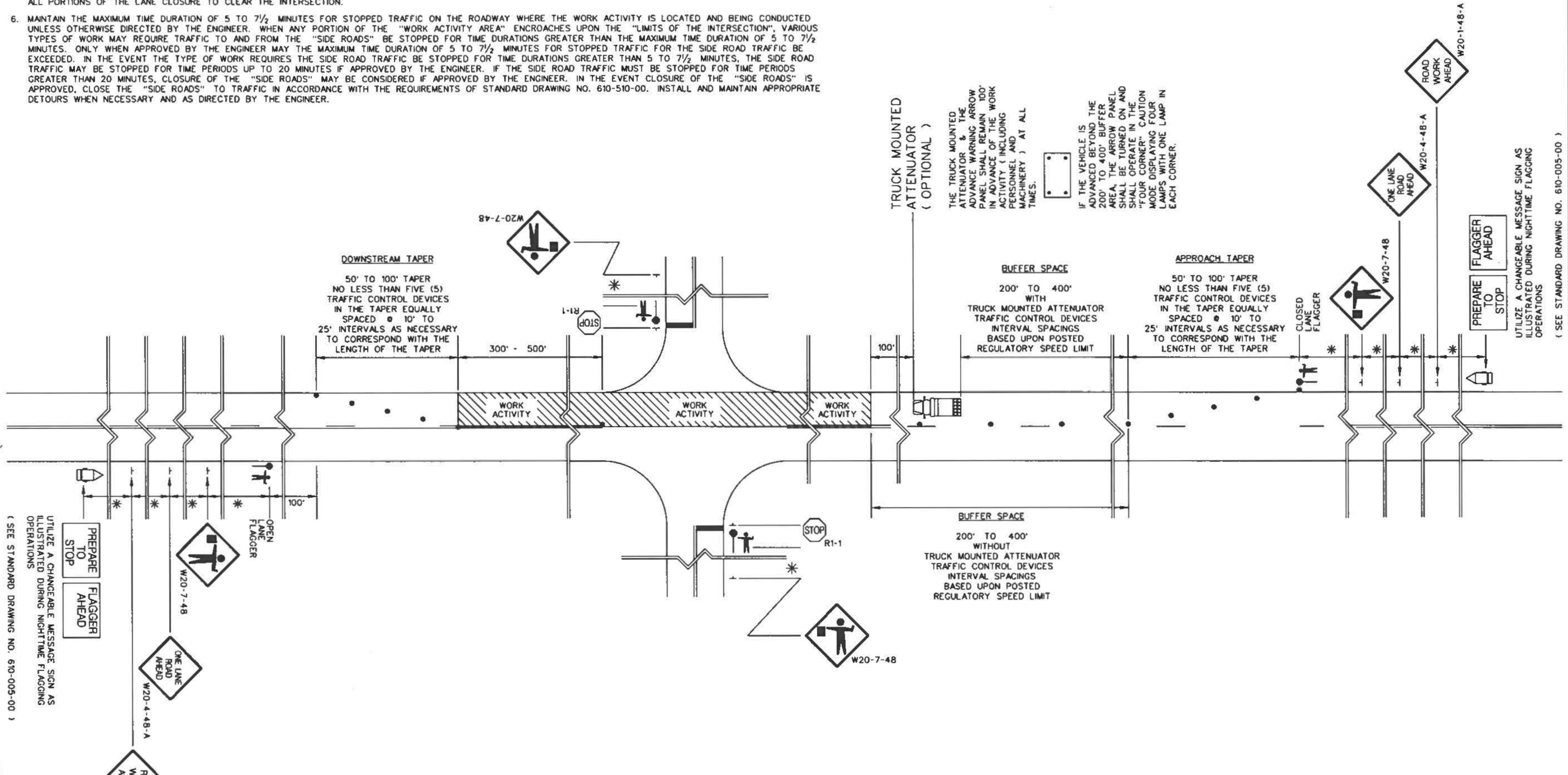


TABLE A
SIGN PLACEMENT INTERVALS

SPEED LIMIT	*
* ≤ 35 MPH LOW SPEED	200
* 40 - 50 MPH INTERMEDIATE SPEED	350
* 55 MPH HIGH SPEED	500

* REGULATORY POSTED SPEED LIMIT PRIOR TO BEGINNING WORK

TABLE B
TRAFFIC CONTROL DEVICE SPACING INTERVALS
WORK ACTIVITY / BUFFER SPACE AREAS

SPEED LIMIT	SPACING INTERVALS
≤ 35 MPH	25 FEET
40 - 55 MPH	50 FEET

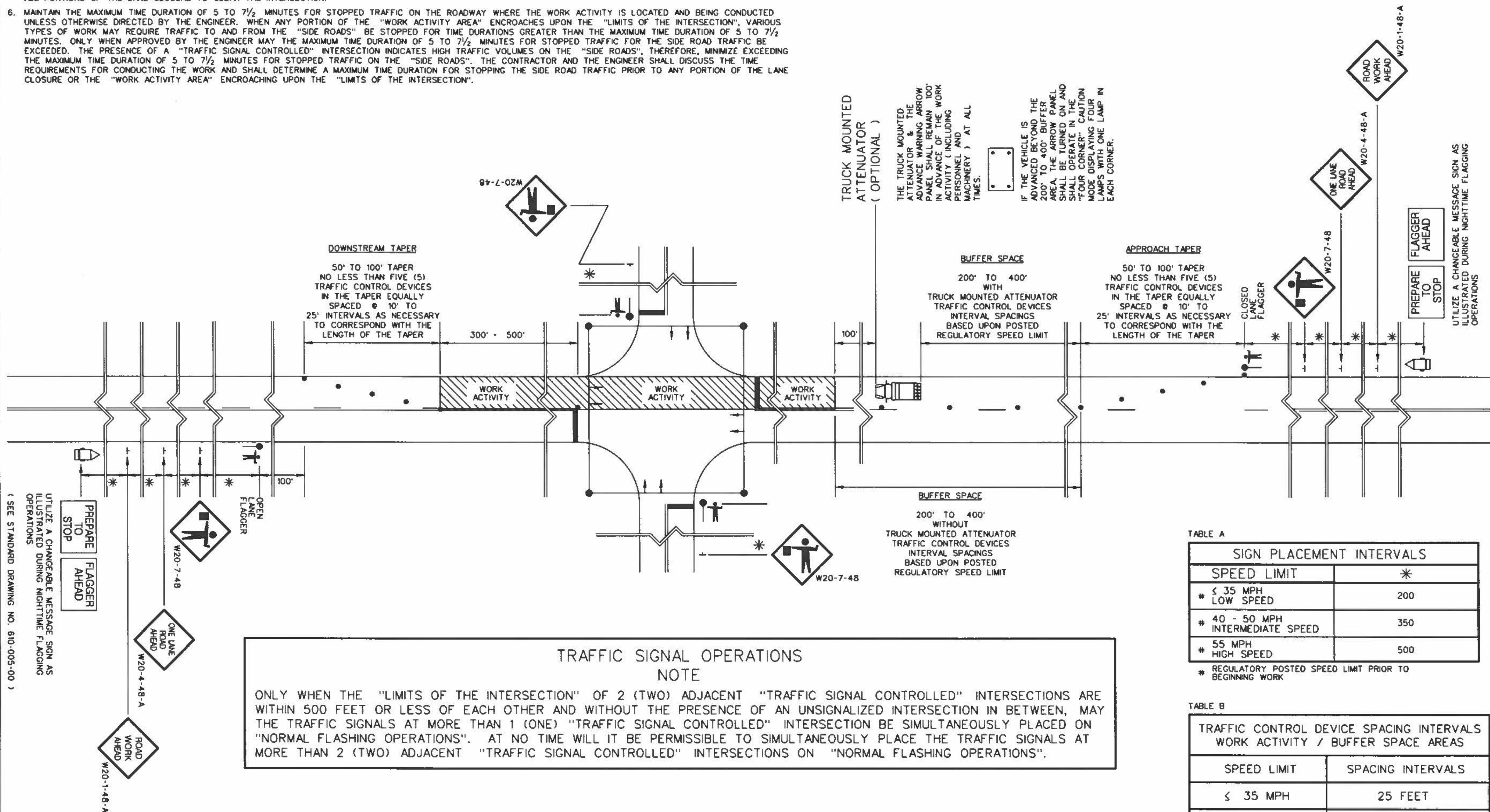
UTILIZE A CHANGEABLE MESSAGE SIGN AS ILLUSTRATED DURING NIGHTTIME FLAGGING OPERATIONS
(SEE STANDARD DRAWING NO. 610-005-00)

DRAWING 610-005-50 NOTES

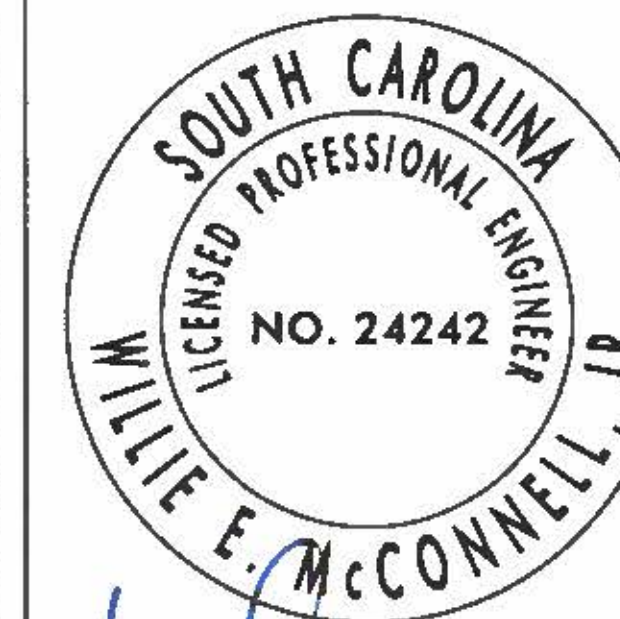
- SEE STANDARD DRAWING NO. 610-005-00 FOR ALL GENERAL NOTES AND REQUIREMENTS. THE FOLLOWING NOTES ARE SPECIFIC REQUIREMENTS FOR THIS STANDARD DRAWING.
- WHEN THE WORK ZONE PROCEEDS THROUGH OR MUST ENCR OACH UPON THE "LIMITS OF THE INTERSECTION", DO NOT ALLOW THE "APPROACH TAPER" OR THE "DOWNSTREAM TAPER" OF THE LANE CLOSURE TO ENCR OACH UPON THE "LIMITS OF THE INTERSECTION". ONLY THE "BUFFER SPACE" OR THE "WORK ACTIVITY AREA" OF THE LANE CLOSURE MAY ENCR OACH UPON THE "LIMITS OF THE INTERSECTION".
- WHEN THE WORK ZONE PROCEEDS THROUGH OR MUST ENCR OACH UPON THE "LIMITS OF THE INTERSECTION" OF A "TRAFFIC SIGNAL CONTROLLED" INTERSECTION, THE CONTRACTOR SHALL HAVE THE TRAFFIC SIGNAL PLACED ON "NORMAL FLASHING OPERATIONS". THE CONTRACTOR SHALL UTILIZE FLAGGERS TO CONTROL AND DIRECT ALL TRAFFIC ENTERING AND PASSING THROUGH THE INTERSECTION UNLESS OTHERWISE DIRECTED BY THE ENGINEER. CLEAR COMMUNICATIONS BY RADIO OR OTHER EFFECTIVE METHOD BETWEEN ALL FLAGGERS IS REQUIRED TO ENSURE SAFE AND EFFICIENT CONTROL OF ALL TRAFFIC APPROACHING AND PASSING THROUGH THE INTERSECTION. MAINTAIN THESE FLAGGERS IN PLACE FOR THE DURATION THAT ANY PORTION OF THE "BUFFER SPACE" OR THE "WORK ACTIVITY AREA" MAY ENCR OACH UPON THE "LIMITS OF THE INTERSECTION". UPON CLEARANCE OF THE "LIMITS OF THE INTERSECTION" BY THE WORK TRAIN THAT WILL PERMIT THE LOCATION OF THE SUBSEQUENT "FLAGGER STATION" BE NO LESS THAN 200' PAST THE "LIMITS OF THE INTERSECTION", ENSURE THE TRAFFIC SIGNAL IS RETURNED TO NORMAL OPERATIONAL STATUS AND IS OPERATING IN ACCORDANCE WITH ALL OPERATIONAL FUNCTIONS PRIOR TO INITIATION OF THE "NORMAL FLASHING OPERATIONS".
- WHEN THE WORK ZONE PROCEEDS THROUGH OR MUST ENCR OACH UPON THE "LIMITS OF THE INTERSECTION" OF A "TRAFFIC SIGNAL CONTROLLED" INTERSECTION, THE CONTRACTOR SHOULD CONTINUE THE WORK OPERATIONS THROUGH THE INTERSECTION TO A LOCATION POINT BEYOND THE "LIMITS OF THE INTERSECTION" THAT WILL PERMIT THE WORK TRAIN TO CLEAR THE INTERSECTION AND THE LOCATION OF THE SUBSEQUENT "FLAGGER STATION" BE NO LESS THAN 200' PAST THE "LIMITS OF THE INTERSECTION" UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- WHEN THE WORK ZONE PROCEEDS THROUGH A "TRAFFIC SIGNAL CONTROLLED" INTERSECTION, CONTINUE THE WORK OPERATIONS THROUGH THE INTERSECTION TO A SPECIFIC LOCATION POINT WITHIN THE "DEPARTURE LANE" NO LESS THAN 300 FT TO 500 FT BEYOND THE LIMITS OF THE INTERSECTION TO ALLOW THE WORK TRAIN AND ALL PORTIONS OF THE LANE CLOSURE TO CLEAR THE INTERSECTION.
- MAINTAIN THE MAXIMUM TIME DURATION OF 5 TO 7½ MINUTES FOR STOPPED TRAFFIC ON THE ROADWAY WHERE THE WORK ACTIVITY IS LOCATED AND BEING CONDUCTED UNLESS OTHERWISE DIRECTED BY THE ENGINEER. WHEN ANY PORTION OF THE "WORK ACTIVITY AREA" ENCR OACHES UPON THE "LIMITS OF THE INTERSECTION", VARIOUS TYPES OF WORK MAY REQUIRE TRAFFIC TO AND FROM THE "SIDE ROADS" BE STOPPED FOR TIME DURATIONS GREATER THAN THE MAXIMUM TIME DURATION OF 5 TO 7½ MINUTES. ONLY WHEN APPROVED BY THE ENGINEER MAY THE MAXIMUM TIME DURATION OF 5 TO 7½ MINUTES FOR STOPPED TRAFFIC FOR THE SIDE ROAD TRAFFIC BE EXCEEDED. THE PRESENCE OF A "TRAFFIC SIGNAL CONTROLLED" INTERSECTION INDICATES HIGH TRAFFIC VOLUMES ON THE "SIDE ROADS", THEREFORE, MINIMIZE EXCEEDING THE MAXIMUM TIME DURATION OF 5 TO 7½ MINUTES FOR STOPPED TRAFFIC ON THE "SIDE ROADS". THE CONTRACTOR AND THE ENGINEER SHALL DISCUSS THE TIME REQUIREMENTS FOR CONDUCTING THE WORK AND SHALL DETERMINE A MAXIMUM TIME DURATION FOR STOPPING THE SIDE ROAD TRAFFIC PRIOR TO ANY PORTION OF THE LANE CLOSURE OR THE "WORK ACTIVITY AREA" ENCR OACHING UPON THE "LIMITS OF THE INTERSECTION".

INTERSECTION TRAFFIC CONTROLLED BY FLAGGERS

TRAFFIC SIGNAL OPERATIONAL STATUS	RESPONSIBLE ENTITY FOR INITIATING FLASHING OPERATIONS		
	FLASHING OPERATIONS	DISTRICT TRAFFIC SIGNAL TECHNICIAN	TRAFFIC SIGNAL SUB-CONTRACTOR



WORK ZONE TRAFFIC CONTROL ENGINEER



Willie E. McConnell, Jr.
SIGNATURE
6/11/2018
DATE

#	DATE	CHK	DESCRIPTION
1	4-27-18	WEM	NOTE 5 ADDED
0	8-12-14	JCS	NEW DRAWING



STANDARD DRAWING
FLAGGING OPERATIONS
WORK ZONES
CONTINUING THROUGH
TRAFFIC SIGNAL
CONTROLLED
INTERSECTIONS with
FLAGGERS

610-005-50
EFFECTIVE LETTING DATE | JAN 2019

TABLE A
SIGN PLACEMENT INTERVALS

SPEED LIMIT	INTERVALS
* < 35 MPH LOW SPEED	200
* 40 - 50 MPH INTERMEDIATE SPEED	350
* 55 MPH HIGH SPEED	500

* REGULATORY POSTED SPEED LIMIT PRIOR TO BEGINNING WORK

TABLE B
TRAFFIC CONTROL DEVICE SPACING INTERVALS
WORK ACTIVITY / BUFFER SPACE AREAS

SPEED LIMIT	SPACING INTERVALS
< 35 MPH	25 FEET
40 - 55 MPH	50 FEET

REFERENCES

DRAWING 610-005-60 NOTES

- SEE STANDARD DRAWING NO. 610-005-00 FOR ALL GENERAL NOTES AND REQUIREMENTS. THE FOLLOWING NOTES ARE SPECIFIC REQUIREMENTS FOR THIS STANDARD DRAWING.
- INSTALL, MAINTAIN AND CONDUCT FLAGGING OPERATIONS FOR A WORK ZONE THAT BEGINS AT AN INTERSECTION AND IS PRESENT WITHIN THE TRAVEL LANE OF A TWO-LANE TWO-WAY ROADWAY DEPARTING FROM AN INTERSECTION AS ILLUSTRATED BY THIS STANDARD DRAWING. INSTALL AND MAINTAIN ALL ADVANCE WARNING SIGNS AND TRAFFIC CONTROL DEVICES AS ILLUSTRATED.
- CONVERT THIS TRAFFIC CONTROL SETUP TO A STANDARD FLAGGING OPERATION SETUP IN COMPLIANCE WITH THE REQUIREMENTS OF STANDARD DRAWING NO. 610-005-10 FOR A "WORK ACTIVITY AREA" LOCATED IN THE "DEPARTURE LANE" OF A TWO-LANE TWO-WAY ROAD INTERSECTING AN ADJACENT TWO-LANE TWO-WAY ROAD WHEN THE "LIMITS of the WORK ACTIVITY AREA" NEAREST THE INTERSECTION PROGRESS BEYOND A MINIMUM DISTANCE INTERVAL AWAY FROM THE INTERSECTION AS SPECIFIED IN *TABLE C* UNLESS OTHERWISE DIRECTED BY THE ENGINEER. THE "LIMITS of the WORK ACTIVITY AREA" NEAREST THE INTERSECTION MUST BE LOCATED AT A SPECIFIC LOCATION POINT NO LESS THAN THE CUMULATIVE DISTANCE FROM THE INTERSECTION AS SPECIFIED BY THE "TOTAL DISTANCE REQUIRED for CONVERSION" IN *TABLE C*. THE DISTANCE FIGURES SPECIFIED IN THE "TOTAL DISTANCE REQUIREMENTS for CONVERSION" ARE CALCULATED BASED UPON THE POSTED REGULATORY SPEED LIMIT OF THE ROAD PRIOR TO BEGINNING THE WORK.
- SUFFICIENT "BUFFER SPACE" MAY BE UNAVAILABLE WHEN CONDUCTING WORK ACTIVITIES IMMEDIATELY CONTIGUOUS TO THE INTERSECTION. INSTALL THE "BUFFER SPACE" AND INCREASE AS NECESSARY AS THE "LIMITS of the WORK ACTIVITY AREA" NEAREST THE INTERSECTION MOVE AWAY FROM THE INTERSECTION UNTIL SUFFICIENT SPACE IS AVAILABLE TO INSTALL AND MAINTAIN THE LENGTH OF "BUFFER SPACE" REQUIRED BASED UPON THE LEGAL POSTED REGULATORY SPEED LIMIT OF THE ROADWAY PRIOR TO BEGINNING THE WORK.
- FLAGGING OPERATIONS CONDUCTED IN ACCORDANCE WITH THIS TRAFFIC CONTROL SETUP AT NIGHT SHALL REQUIRE SUPPLEMENTATION OF EACH ADVANCE WARNING SIGN ARRAY ON EACH APPROACH TO THE INTERSECTION WITH A TRAILER MOUNTED CHANGEABLE MESSAGE SIGN. DURING A NIGHTTIME FLAGGING OPERATION SCENARIO WHERE THE "WORK ACTIVITY AREA" BEGINS AT AN INTERSECTION AS ILLUSTRATED BY THIS STANDARD DRAWING, UTILIZATION OF TRAILER MOUNTED CHANGEABLE MESSAGE SIGNS TO SUPPLEMENT EACH ARRAY OF ADVANCE WARNING SIGNS ON EACH LEG OF THE INTERSECTION IS REQUIRED. INSTALL, OPERATE AND MAINTAIN THESE TRAILER MOUNTED CHANGEABLE MESSAGE SIGNS AS ILLUSTRATED.

TABLE C. THE "TOTAL DISTANCE REQUIRED for CONVERSION" FIGURES ARE THE MINIMUM DISTANCE INTERVALS FROM THE INTERSECTION TO THE "LIMITS of the WORK ACTIVITY AREA" NEAREST THE INTERSECTION TO INDICATE WHEN IT BECOMES ACCEPTABLE TO CONVERT FROM THIS TRAFFIC CONTROL SETUP FOR A FLAGGING OPERATION INSTALLED AND CONDUCTED IN A "DEPARTURE LANE" TO A STANDARD FLAGGING OPERATION INSTALLED AND CONDUCTED PER STANDARD DRAWING NO. 610-005-10

		LOW SPEED < 35 MPH	INTERMEDIATE SPEED 40 - 50 MPH	HIGH SPEED 55 MPH
DAYTIME	Space for Stopped Traffic to Queue	100 feet Minimum	100 feet Minimum	100 feet Minimum
	Advance Warning Sign Placement Intervals (Interval / Total)	200 feet / 600 feet	350 feet / 1050 feet	500 feet / 1500 feet
	Approach Taper	100 feet	100 feet	100 feet
	Buffer Space	200 feet	300 feet	400 feet
	Total Distance Required for Conversion	1000 feet	1550 feet	2100 feet
NIGHTTIME	Changeable Message Sign Placement Interval	200 feet	350 feet	500 feet
	Total Distance Required for Conversion	1200 feet	1900 feet	2600 feet

NOTE: THE DISTANCE INTERVALS REQUIRED FOR A TRUCK MOUNTED ATTENUATOR, INCLUDING THE LENGTH OF THE VEHICLE AND THE ASSOCIATED 100-FOOT ROLL-AHEAD DISTANCE, IS NOT INCLUDED IN THESE CALCULATIONS SINCE THIS DEVICE IS OPTIONAL. HOWEVER, WHEN A TRUCK MOUNTED ATTENUATOR IS UTILIZED, ADD AN ADDITIONAL 125 FEET TO THE TOTAL DISTANCE REQUIRED FOR CONVERSION TO COMPENSATE FOR THE 100-FOOT ROLL-AHEAD DISTANCE AND THE APPROXIMATE LENGTH OF THE VEHICLE AND THE ATTENUATOR.

TABLE A

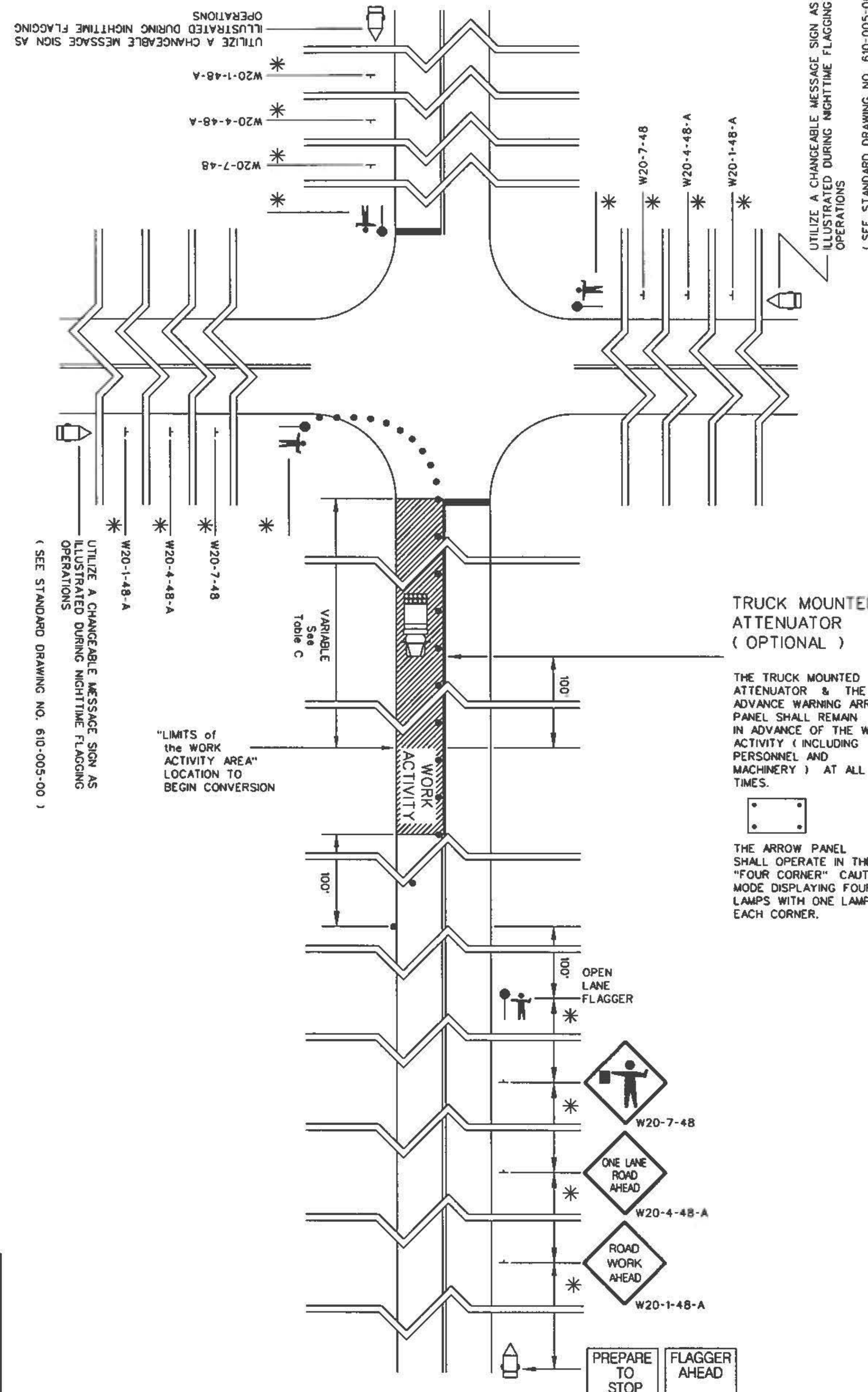
SIGN PLACEMENT INTERVALS	
SPEED LIMIT	*
< 35 MPH LOW SPEED	200
40 - 50 MPH INTERMEDIATE SPEED	350
55 MPH HIGH SPEED	500

* REGULATORY POSTED SPEED LIMIT PRIOR TO BEGINNING WORK

TABLE B

TRAFFIC CONTROL DEVICE SPACING INTERVALS WORK ACTIVITY / BUFFER SPACE AREAS	
SPEED LIMIT	SPACING INTERVALS
< 35 MPH	25 FEET
40 - 55 MPH	50 FEET

(SEE STANDARD DRAWING NO. 610-005-00)



TRUCK MOUNTED ATTENUATOR (OPTIONAL)

THE TRUCK MOUNTED ATTENUATOR & THE ADVANCE WARNING ARROW PANEL SHALL REMAIN 100' IN ADVANCE OF THE WORK ACTIVITY (INCLUDING PERSONNEL AND MACHINERY) AT ALL TIMES.

THE ARROW PANEL SHALL OPERATE IN THE "FOUR CORNER" CAUTION MODE DISPLAYING FOUR LAMPS WITH ONE LAMP IN EACH CORNER.

UTILIZE A CHANGEABLE MESSAGE SIGN AS ILLUSTRATED DURING NIGHTTIME FLAGGING OPERATIONS

(SEE STANDARD DRAWING NO. 610-005-00)

WORK ZONE TRAFFIC CONTROL ENGINEER



Willie F. McConnell, Jr.
SIGNATURE
6/1/2018
DATE

6			
5			
4			
3			
2			
1	4-27-18	WEM	UPDATED TITLE BLOCK
0	8-12-14	JCS	NEW DRAWING
#	DATE	CHK	DESCRIPTION



SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 405
COLUMBIA, SC 29201

STANDARD DRAWING

FLAGGING OPERATIONS
WORK ZONES
BEGINNING @
INTERSECTIONS with
TWO-LANE TWO-WAY
ROADWAYS
DEPARTURE LANE

610-005-60

EFFECTIVE LETTING DATE JAN 2019

THIS DRAWING IS NOT TO SCALE

DRAWING 610-005-70 NOTES

- SEE STANDARD DRAWING NO. 610-005-00 FOR ALL GENERAL NOTES AND REQUIREMENTS. THE FOLLOWING NOTES ARE SPECIFIC REQUIREMENTS FOR THIS STANDARD DRAWING.
- INSTALL, MAINTAIN AND CONDUCT FLAGGING OPERATIONS FOR A WORK ZONE THAT TERMINATES AT AN INTERSECTION AND IS PRESENT WITHIN THE TRAVEL LANE OF A TWO-LANE TWO-WAY ROADWAY APPROACHING THE INTERSECTION AS ILLUSTRATED BY THIS STANDARD DRAWING. INSTALL ALL ADVANCE WARNING SIGNS AND TRAFFIC CONTROL DEVICES PRIOR TO BEGINNING THE FLAGGING OPERATION AND REMOVE THE SIGNS AND THE TRAFFIC CONTROL DEVICES IMMEDIATELY UPON TERMINATION OF THE FLAGGING OPERATION.
- CONVERT A STANDARD FLAGGING OPERATION SETUP INSTALLED FOR STANDARD DRAWING NO. 610-005-10 TO THIS TRAFFIC CONTROL SETUP FOR A "WORK ACTIVITY AREA" LOCATED IN THE "APPROACH LANE" OF A TWO-LANE TWO-WAY ROAD INTERSECTING AN ADJACENT TWO-LANE TWO-WAY ROAD WHEN THE "LIMITS of the WORK ACTIVITY AREA" NEAREST THE INTERSECTION ENCLOSED UPON A SPECIFIC LOCATION THAT WILL NOT PERMIT THE MINIMUM DISTANCES SUFFICIENT FOR TRAFFIC TO QUEUE, PROPER INSTALLATION OF THE ADVANCE WARNING SIGNS, THE "OPEN LANE FLAGGER" STATION AND THE "DOWNSTREAM TAPER". THE MINIMUM DISTANCES THAT DETERMINE WHEN CONVERSION TO THIS TRAFFIC CONTROL SETUP IS REQUIRED ARE FOUND IN TABLE D. THE "LIMITS of the WORK ACTIVITY AREA" NEAREST THE INTERSECTION SHOULD NOT ENCLOSED UPON A SPECIFIC LOCATION POINT NO LESS THAN THE CUMULATIVE DISTANCE FROM THE INTERSECTION AS SPECIFIED BY THE "TOTAL DISTANCE REQUIRED for CONVERSION" IN TABLE D. THE DISTANCE FIGURES SPECIFIED IN THE "TOTAL DISTANCE REQUIRED for CONVERSION" ARE CALCULATED BASED UPON THE POSTED REGULATORY SPEED LIMIT OF THE ROAD PRIOR TO BEGINNING THE WORK.

TABLE D. THE "TOTAL DISTANCE REQUIRED for CONVERSION" FIGURES ARE THE MINIMUM DISTANCE INTERVALS FROM THE INTERSECTION TO THE FLAGGER STATION OF THE "OPEN LANE FLAGGER" THAT INDICATE WHEN CONVERSION FROM A STANDARD FLAGGING OPERATION INSTALLATION INSTALLED AND CONDUCTED IN AN "APPROACH LANE" PER STANDARD DRAWING NO. 610-005-10 TO THIS TRAFFIC CONTROL SETUP BECOMES A NECESSARY REQUIREMENT

		LOW SPEED < 35 MPH	INTERMEDIATE SPEED 40 - 50 MPH	HIGH SPEED 55 MPH
DAYTIME	Space for Stopped Traffic to Queue	100 feet Minimum	100 feet Minimum	100 feet Minimum
	Advance Warning Sign Placement Intervals (Interval / Total)	200 feet / 600 feet	350 feet / 1050 feet	500 feet / 1500 feet
	Downstream Taper	100 feet	100 feet	100 feet
	Interval Between End of Downstream Taper and Open Lane Flagger	100 feet	100 feet	100 feet
	Total Distance Required for Conversion	900 feet	1350 feet	1800 feet
NIGHTTIME	Changeable Message Sign Placement Interval	200 feet	350 feet	500 feet
	Total Distance Required for Conversion	1100 feet	1700 feet	2300 feet

NOTE: THE DISTANCE INTERVALS REQUIRED FOR A DOWNSTREAM TAPER VARY FROM 50 FEET TO 100 FEET. THE MAXIMUM DISTANCE OF 100 FEET IS UTILIZED FOR THESE SCENARIOS.

TABLE A

SIGN PLACEMENT INTERVALS	
SPEED LIMIT	*
< 35 MPH LOW SPEED	200
40 - 50 MPH INTERMEDIATE SPEED	350
55 MPH HIGH SPEED	500

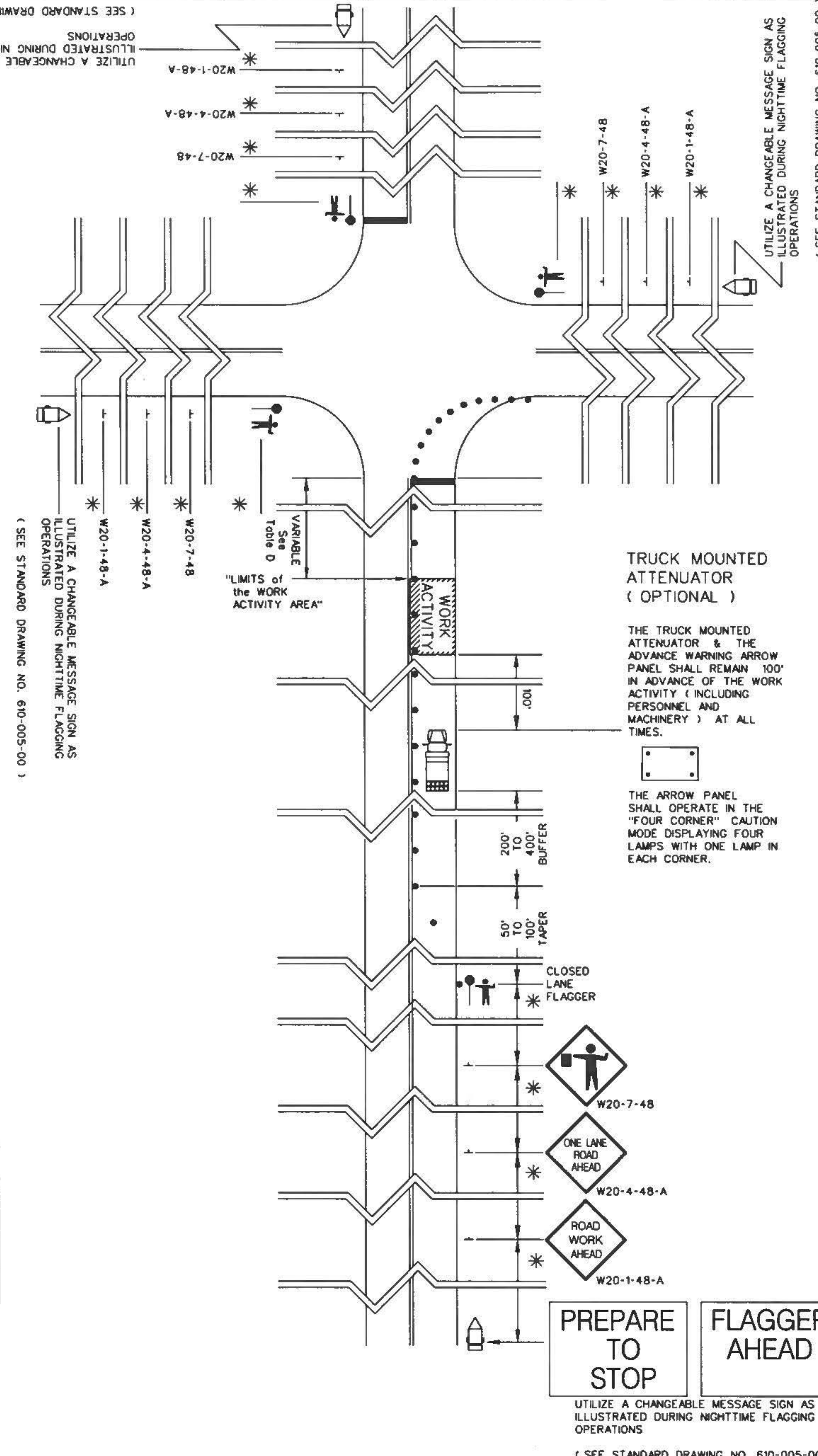
* REGULATORY POSTED SPEED LIMIT PRIOR TO BEGINNING WORK

TABLE B

TRAFFIC CONTROL DEVICE SPACING INTERVALS WORK ACTIVITY / BUFFER SPACE AREAS	
SPEED LIMIT	SPACING INTERVALS
< 35 MPH	25 FEET
40 - 55 MPH	50 FEET

(SEE STANDARD DRAWING NO. 610-005-00)

UTILIZE A CHANGEABLE MESSAGE SIGN AS ILLUSTRATED DURING NIGHTTIME FLAGGING OPERATIONS



(SEE STANDARD DRAWING NO. 610-005-00)

UTILIZE A CHANGEABLE MESSAGE SIGN AS ILLUSTRATED DURING NIGHTTIME FLAGGING OPERATIONS
(SEE STANDARD DRAWING NO. 610-005-00)

REFERENCES

WORK ZONE TRAFFIC CONTROL ENGINEER



Willie E. McConnell, Jr.
SIGNATURE
6/11/2018
DATE

6			
5			
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2			
1	4-27-18	WEM	UPDATED TITLE BLOCK
0	8-12-14	JCS	NEW DRAWING
#	DATE	CHK	DESCRIPTION

SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 405
COLUMBIA, SC 29201

STANDARD DRAWING
FLAGGING OPERATIONS
WORK ZONES
TERMINATING @
INTERSECTIONS with
TWO-LANE TWO-WAY
ROADWAYS
APPROACH LANE

610-005-70

EFFECTIVE LETTING DATE | JAN 2019

(SEE STANDARD DRAWING NO. 610-005-00)

REFERENCES

WORK ZONE TRAFFIC CONTROL ENGINEER



Willie F. McConnell
SIGNATURE
8/2/12
DATE

6			
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1	2-14-11	JCS	GENERAL UPDATE
0	8-21-07	JCS	DRAWING NO. UPDATE
#	DATE	CHK	DESCRIPTION

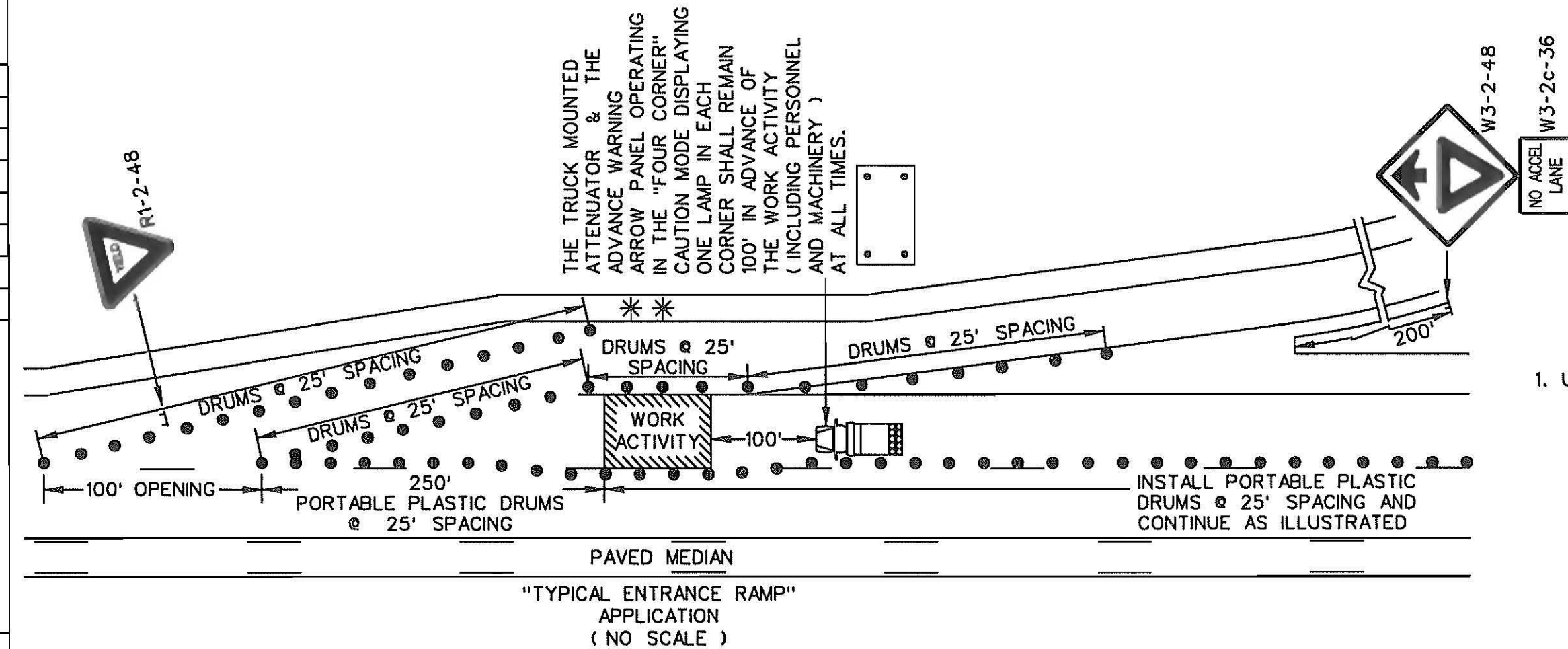
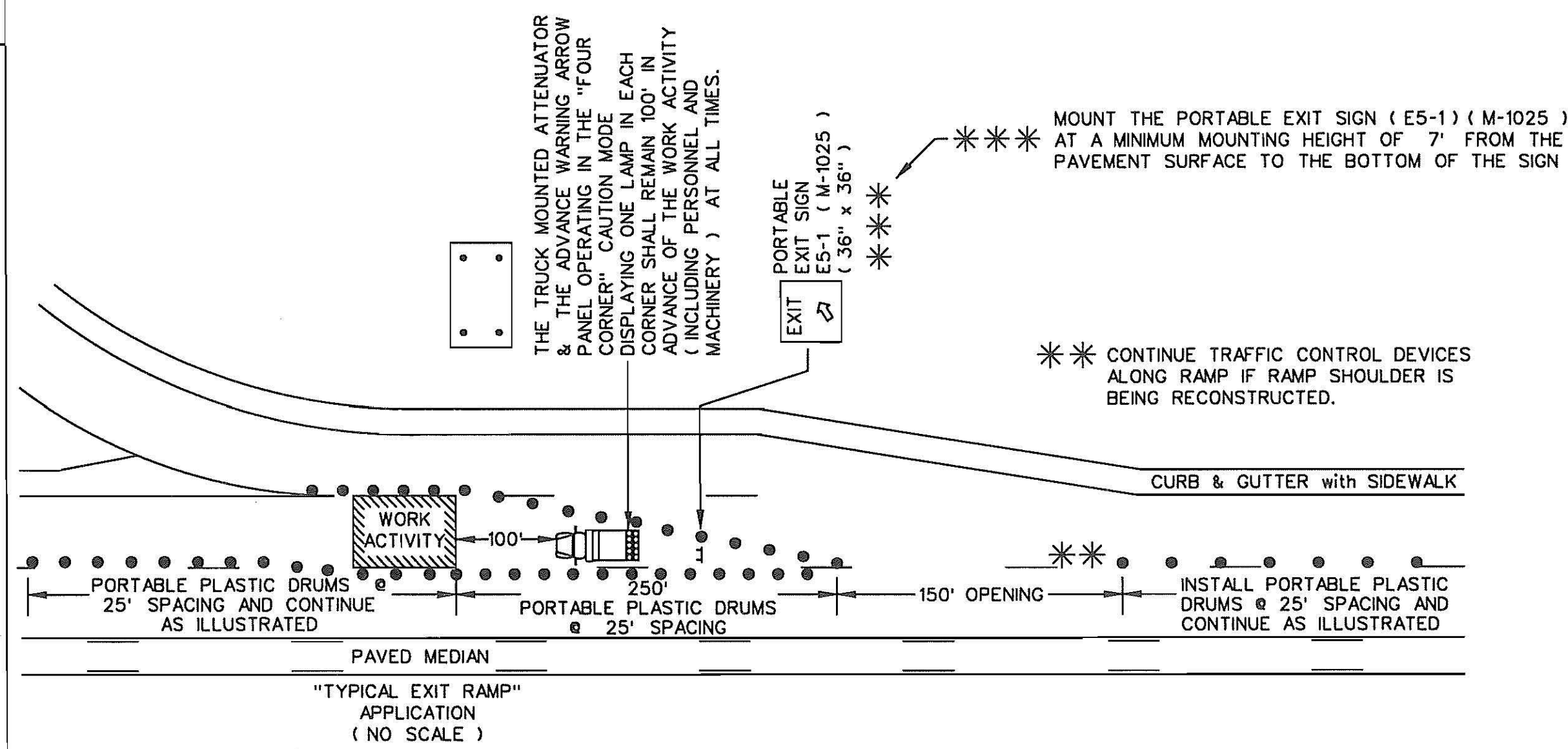
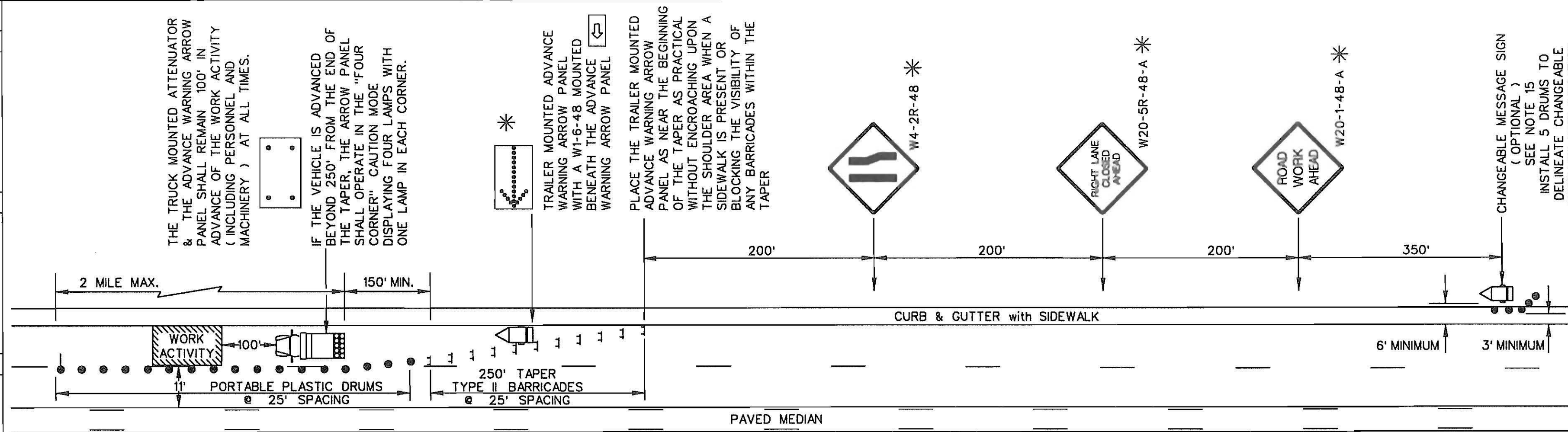
SCDOT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 405
COLUMBIA, SC 29201

STANDARD DRAWING

LANE CLOSURE
NIGHTTIME
URBAN LOW SPEED
< / = 35 MPH

610-015-00

EFFECTIVE LETTING DATE: JAN, 2013 THIS DRAWING IS NOT TO SCALE



ADVANCE WARNING ARROW PANEL

ALL ADVANCE WARNING ARROW PANELS SHALL BE 48" x 96" WITH A MINIMUM LEGIBILITY DISTANCE OF 1 MILE. PLACEMENT OF AN ADVANCE WARNING ARROW PANEL MAY REQUIRE ADJUSTMENTS DUE TO HORIZONTAL AND/OR VERTICAL ALIGNMENT OR OTHER SIGHT DISTANCE RESTRICTIONS. THE PANEL FACE SHALL BE NONREFLECTIVE BLACK. ALL ADVANCE WARNING ARROW PANELS SHALL COMPLY WITH THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, LATEST EDITION.

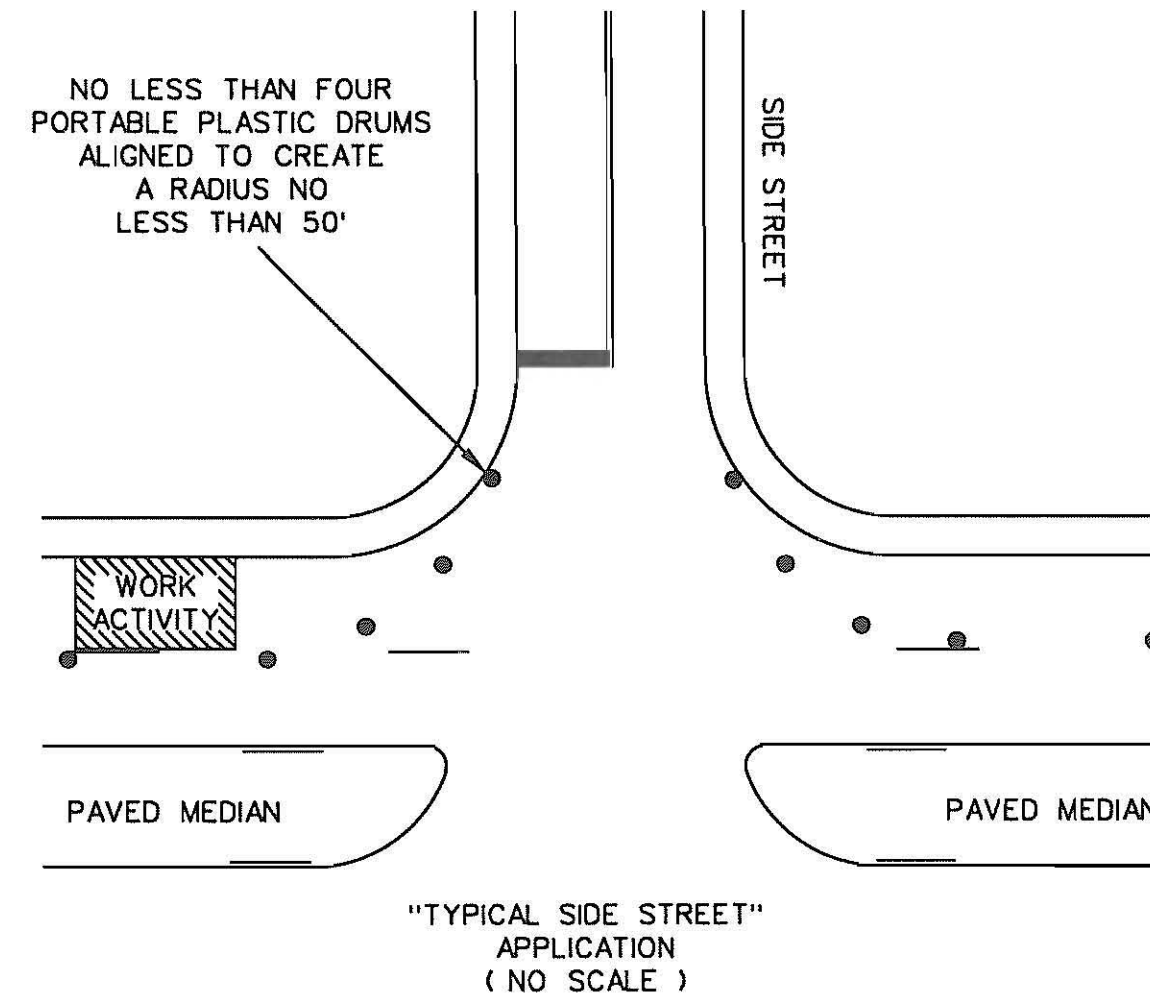
WHEN AN ADVANCE WARNING ARROW PANEL IS REQUIRED TO OPERATE IN THE CAUTION MODE, THE ADVANCE WARNING ARROW PANEL SHALL DISPLAY THE "FOUR CORNERS" CAUTION MODE, WITH ONE LAMP IN EACH CORNER. DISPLAY OF ANY OTHER TYPE OF CAUTION MODE OTHER THAN THE "FOUR CORNERS" CAUTION MODE SUCH AS THE "FLASHING BAR" OR THE "ALTERNATING DIAMOND" CAUTION MODES ARE UNACCEPTABLE AND PROHIBITED.

LEGEND

- PORTABLE PLASTIC DRUMS

GENERAL NOTES

- ALL SIGN LOCATIONS ARE TO BE MEASURED FROM THE WORK AREA. WORK LIMITS FOR THE PROJECT WILL BE DETERMINED BY THE ENGINEER AND AS INDICATED IN THE CONTRACT.
- INSTALL ADVANCE WARNING SIGNS MOUNTED ON PORTABLE SIGN SUPPORTS NO LESS THAN 4 FEET FROM THE NEAR EDGE OF THE SIGN TO THE NEAR EDGE OF AN ADJACENT TRAVEL LANE ON ROADWAYS WITH EARTH SHOULDERS AND NO LESS THAN 6 FEET FROM THE NEAR EDGE OF THE SIGN TO THE NEAR EDGE OF AN ADJACENT TRAVEL LANE ON ROADWAYS WITH PAVED SHOULDERS. WHEN CURB & GUTTER IS PRESENT, INSTALL THE SIGN NO LESS THAN 2 FEET FROM THE NEAR EDGE OF THE SIGN TO THE FACE OF THE CURB.
- SPACINGS INDICATED ARE FOR NORMAL CONDITIONS; ADJUSTMENTS MAY BE REQUIRED DUE TO HORIZONTAL AND/OR VERTICAL ALIGNMENTS OR OTHER SIGHT DISTANCE RESTRICTIONS.
- ALL SIGNS MOUNTED ON PORTABLE SIGN SUPPORTS SHALL HAVE A MINIMUM MOUNTING HEIGHT OF 5 FEET FROM THE GROUND TO THE BOTTOM OF THE SIGN. ALL SIGNS MOUNTED ON GROUND MOUNTED U-CHANNEL POSTS OR SQUARE STEEL TUBE POSTS SHALL HAVE A MINIMUM MOUNTING HEIGHT OF 7 FEET FROM THE GRADE ELEVATION OF THE NEAR EDGE OF THE ADJACENT TRAVEL LANE TO THE BOTTOM OF THE SIGN UNLESS OTHERWISE DIRECTED BY THE DEPARTMENT. MOUNT ALL SIGNS STRAIGHT AND LEVEL AND WITH THE FACE OF THE SIGNS PERPENDICULAR TO THE SURFACE OF THE ROADWAY.
- REFLECTORIZE ORANGE ADVANCE WARNING SIGNS AND ANY ORANGE AREAS OF A MULTI-COLORED ADVANCE WARNING SIGN WITH A FLUORESCENT ORANGE COLORED PRISMATIC RETROREFLECTIVE SHEETING. REFLECTORIZE WHITE REGULATORY SIGNS AND ANY WHITE AREAS OF A MULTI-COLORED ADVANCE WARNING SIGN WITH A WHITE COLORED PRISMATIC RETROREFLECTIVE SHEETING.
- ALL TRAFFIC CONTROL DEVICES SHALL COMPLY WITH ALL NCHRP REPORT 350 REQUIREMENTS AND SHALL REQUIRE APPROVAL BY THE DEPARTMENT. ONLY THOSE TRAFFIC CONTROL DEVICES INCLUDED ON THE "APPROVED PRODUCTS LIST FOR TRAFFIC CONTROL DEVICES IN WORK ZONES" ARE CONSIDERED ACCEPTABLE FOR USE. THIS LIST MAY BE ACCESSED ON THE DEPARTMENT'S WEB SITE AT: www.scdot.org.
- THE CONTRACTOR SHALL PROVIDE AND UTILIZE ANY SPECIAL SIGN MOUNTING ASSEMBLIES AND HARDWARE THAT MAY BE NECESSARY FOR INSTALLING AND MOUNTING SIGNS IN AREAS OF CONCRETE MEDIAN BARRIER, BRIDGE PARAPET WALLS OR DOUBLEFACED GUARDRAIL.
- REFLECTORIZE ALL PORTABLE PLASTIC DRUMS AND 42" OVERSIZED TRAFFIC CONES WITH TYPE III FLEXIBLE PRISMATIC RETROREFLECTIVE SHEETING UNLESS OTHERWISE DIRECTED BY THE DEPARTMENT. 42" OVERSIZED TRAFFIC CONES MAY BE SUBSTITUTED FOR THE PORTABLE PLASTIC DRUMS IN THIS TYPICAL TRAFFIC CONTROL SETUP. THE 42" OVERSIZED TRAFFIC CONES SHALL COMPLY WITH ALL REQUIREMENTS OF THE STANDARD SPECIFICATIONS.
- REFLECTORIZE ALL BARRICADES WITH A TYPE VIII OR IX PRISMATIC RETROREFLECTIVE SHEETING ON ALL PROJECTS LET TO CONTRACT AFTER MAY 1, 2012 UNLESS OTHERWISE DIRECTED BY THE DEPARTMENT.
- TYPE II BARRICADES SHALL HAVE A MINIMUM WIDTH OF 3 FEET UNLESS OTHERWISE DIRECTED BY THE DEPARTMENT.
- CONDUCT THE WORK IN SUCH A MANNER THAT WILL MINIMIZE ENCROACHMENT OF TRAFFIC CONTROL DEVICES, EQUIPMENT, PERSONNEL, MATERIALS OR ANY WORK RELATED VEHICLES ONTO AN ADJACENT TRAVEL LANE OPEN TO TRAFFIC. INSTALL, MAINTAIN AND ADJUST THE TRAFFIC CONTROL DEVICES AS NECESSARY TO ENSURE PROPER DELINEATION OF THE WORK AREA.
- LANE CLOSURES ARE RESTRICTED TO MAXIMUM LENGTHS OF 2 MILES UNLESS OTHERWISE DIRECTED BY THE DEPARTMENT.
- IF WORK IS BEING CONDUCTED SIMULTANEOUSLY AT TWO DIFFERENT LOCATIONS WITHIN THE SAME TRAVEL LANE UNDER TWO SEPARATE LANE CLOSURES ON A LOW SPEED URBAN ROADWAY, SEPARATE THE TWO LANE CLOSURES BY NO LESS THAN 1 MILE FROM THE END OF THE FIRST CLOSURE THAT A MOTORIST WILL ENCOUNTER TO THE BEGINNING OF THE TAPER OF THE SECOND CLOSURE.
- IF WORK IS BEING CONDUCTED SIMULTANEOUSLY AT TWO DIFFERENT LOCATIONS IN THE SAME DIRECTION BUT WITHIN DIFFERENT TRAVEL LANES UNDER TWO SEPARATE LANE CLOSURES ON A LOW SPEED URBAN ROADWAY, SEPARATE THE TWO LANE CLOSURES BY NO LESS THAN 2 MILES FROM THE END OF THE FIRST CLOSURE THAT A MOTORIST WILL ENCOUNTER TO THE BEGINNING OF THE TAPER OF THE SECOND CLOSURE.
- UTILIZATION OF A CHANGEABLE MESSAGE SIGN IS OPTIONAL WITH THIS TRAFFIC CONTROL SETUP. HOWEVER, WHEN A CHANGEABLE MESSAGE SIGN IS UTILIZED, INSTALL THE SIGN AS ILLUSTRATED ON THIS STANDARD DRAWING UNLESS OTHERWISE DIRECTED BY THE SPECIAL PROVISIONS, THE PLANS AND/OR THE ENGINEER. INSTALL THE CHANGEABLE MESSAGE SIGN NO LESS THAN 6 FEET FROM THE NEAR EDGE OF THE ADJACENT TRAVEL LANE AND SUPPLEMENT THE SIGN LOCATION WITH NO LESS THAN 5 PORTABLE PLASTIC DRUMS FOR DELINEATION AS ILLUSTRATED. 36" STANDARD TRAFFIC CONES OR 42" OVERSIZED TRAFFIC CONES ARE PROHIBITED AS SUBSTITUTES FOR THE PORTABLE PLASTIC DRUMS IN THIS APPLICATION. DURING A RIGHT LANE CLOSURE, THE SIGN SHOULD FLASH ALTERNATELY TO READ "RIGHT LANE CLOSED", "MERGE LEFT" AT A RATE THAT WILL PERMIT MOTORISTS TO READ BOTH MESSAGES AT LEAST ONCE.
- THE DEPARTMENT RESERVES THE RIGHT TO RESTRICT WORK OPERATIONS AND/OR WITHHOLD THE MONTHLY ESTIMATE IF THE TRAFFIC CONTROL IS NOT PROPERLY INSTALLED AND MAINTAINED AS DIRECTED BY THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, THE STANDARD DRAWINGS, THE PLANS AND/OR THE ENGINEER.
- THIS TYPICAL TRAFFIC CONTROL SETUP APPLIES TO THE INSTALLATION OF A LANE CLOSURE ON AN URBAN ROADWAY WITH A POSTED REGULATORY SPEED LIMIT OF 35 MPH OR LESS.



PORTABLE TRUCK MOUNTED ATTENUATOR

- UTILIZE A TRUCK MOUNTED ATTENUATOR ATTACHED TO THE REAR OF A TRUCK WITH A MINIMUM GROSS VEHICULAR WEIGHT (GVW) OF 15,000 POUNDS (ACTUAL WEIGHT). IF THE ADDITION OF SUPPLEMENTAL WEIGHT TO THE VEHICLE AS BALLAST IS NECESSARY, CONTAIN THE MATERIAL WITHIN A STRUCTURE CONSTRUCTED OF STEEL. CONSTRUCT THIS STEEL STRUCTURE TO HAVE A MINIMUM OF FOUR SIDES AND A BOTTOM. A TOP IS OPTIONAL. BOLT THIS STRUCTURE TO THE FRAME OF THE TRUCK. UTILIZE A SUFFICIENT NUMBER OF FASTENERS FOR ATTACHMENT OF THE STEEL STRUCTURE TO THE FRAME OF THE TRUCK TO ENSURE THE STRUCTURE WILL NOT SEPARATE FROM THE FRAME OF THE TRUCK DURING AN IMPACT UPON THE ATTACHED TRUCK MOUNTED ATTENUATOR. UTILIZE EITHER DRY LOOSE SAND OR STEEL REINFORCED CONCRETE FOR BALLAST MATERIAL WITHIN THE STEEL STRUCTURE TO ACHIEVE THE NECESSARY WEIGHT. THE BALLAST MATERIAL SHALL REMAIN CONTAINED WITHIN THE CONFINES OF THE STEEL STRUCTURE AND SHALL NOT PROTRUDE FROM THE STEEL STRUCTURE IN ANY MANNER.
- LOCATE THE TRUCK MOUNTED ATTENUATOR 100 FEET IN ADVANCE OF THE WORK AREA UNLESS OTHERWISE SPECIFIED.
- PROVIDE, INSTALL AND MAINTAIN THE TRUCK MOUNTED ATTENUATOR AS SPECIFIED BY THE STANDARD SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER.
- DUE TO THE WEIGHT OF A TRUCK MOUNTED ATTENUATOR, THE TRUCK MOUNTED ATTENUATOR SUPPLEMENTED WITH AN ADVANCE WARNING ARROW PANEL MAY BE REPLACED WITH A TRAILER MOUNTED ADVANCE WARNING ARROW PANEL WHEN THIS TRAFFIC CONTROL SETUP IS UTILIZED FOR ASPHALT CONCRETE PAVEMENT OPERATIONS. REPLACEMENT WITH A TRAILER MOUNTED ADVANCE WARNING ARROW PANEL SHALL REQUIRE THE ENGINEER'S APPROVAL.

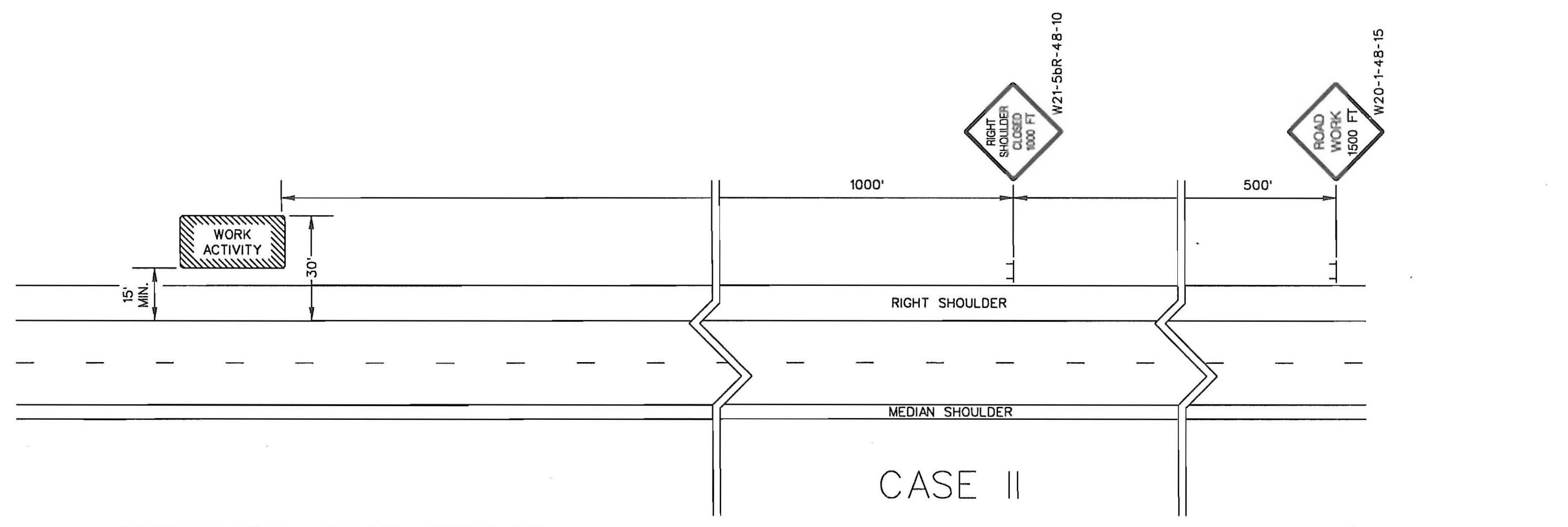
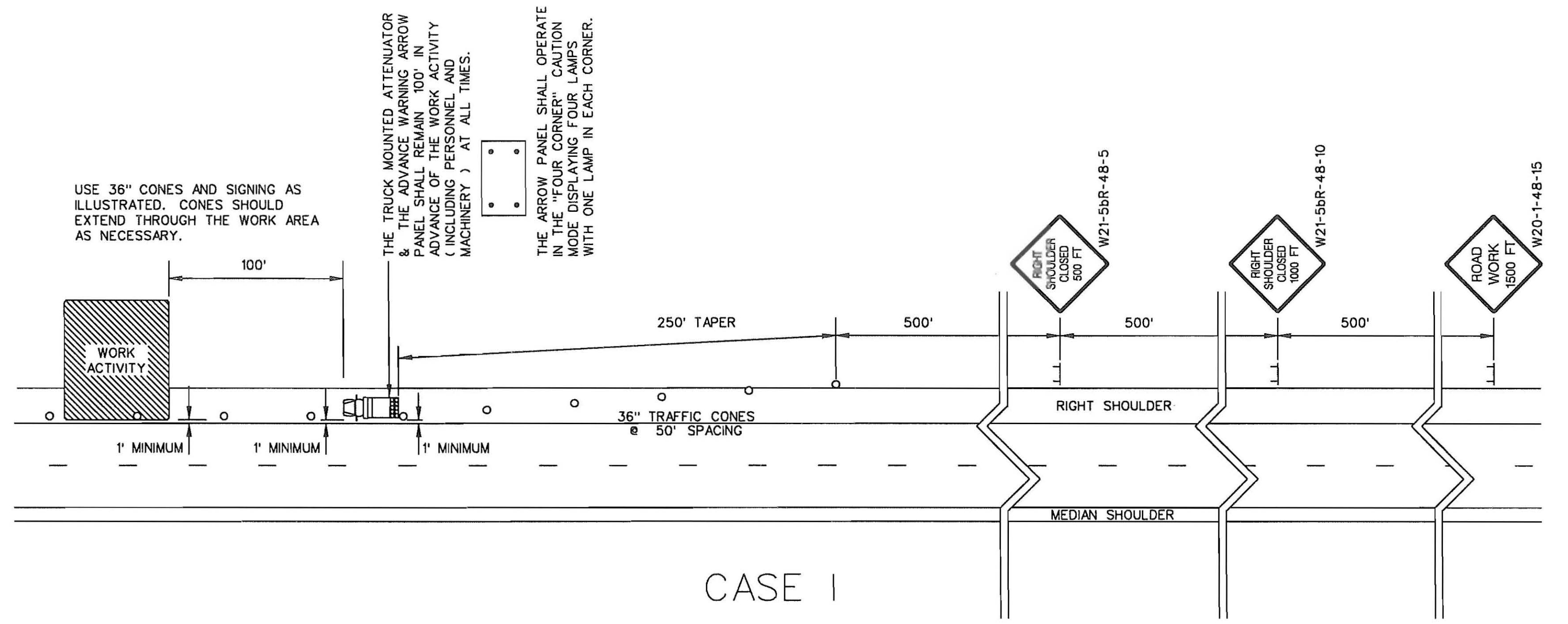
LEFT LANE CLOSURE

- SIGNS ILLUSTRATED ARE FOR A RIGHT LANE CLOSURE.
- WHEN CLOSING THE LEFT TRAVEL LANE, USE THE FOLLOWING:
 - 1 - W4-2L-48
 - 1 - W20-5L-48-A
- THE STRIPES ON THE BARRICADES TO THE LEFT OF TRAFFIC SLOPE DOWNWARD FROM THE UPPER LEFT TO THE LOWER RIGHT.
- THE FLASHING ARROW AND THE "LARGE ARROW" SIGN (W1-6-48) SHALL POINT TO THE RIGHT.
- THE CHANGEABLE MESSAGE SIGN SHALL FLASH ALTERNATELY TO READ "LEFT LANE CLOSED", "MERGE RIGHT".

REFERENCES

GENERAL NOTES

- ALL SIGN LOCATIONS ARE TO BE MEASURED FROM THE WORK AREA. WORK LIMITS FOR THE PROJECT WILL BE DETERMINED BY THE ENGINEER AND AS INDICATED IN THE CONTRACT.
 - INSTALL ADVANCE WARNING SIGNS MOUNTED ON PORTABLE SIGN SUPPORTS NO LESS THAN 4 FEET FROM THE NEAR EDGE OF THE SIGN TO THE NEAR EDGE OF AN ADJACENT TRAVEL LANE ON ROADWAYS WITH EARTH SHOULDERS AND NO LESS THAN 6 FEET FROM THE NEAR EDGE OF THE SIGN TO THE NEAR EDGE OF AN ADJACENT TRAVEL LANE ON ROADWAYS WITH PAVED SHOULDERS. WHEN CURB & GUTTER IS PRESENT, INSTALL THE SIGN NO LESS THAN 2 FEET FROM THE NEAR EDGE OF THE SIGN TO THE FACE OF THE CURB.
 - SPACINGS INDICATED ARE FOR NORMAL CONDITIONS; ADJUSTMENTS MAY BE REQUIRED DUE TO HORIZONTAL AND/OR VERTICAL ALIGNMENTS OR OTHER SIGHT DISTANCE RESTRICTIONS.
 - ALL SIGNS MOUNTED ON PORTABLE SIGN SUPPORTS SHALL HAVE A MINIMUM MOUNTING HEIGHT OF 5 FEET FROM THE GROUND TO THE BOTTOM OF THE SIGN. ALL SIGNS MOUNTED ON GROUND MOUNTED U-CHANNEL POSTS OR SQUARE STEEL TUBE POSTS SHALL HAVE A MINIMUM MOUNTING HEIGHT OF 7 FEET FROM THE GRADE ELEVATION OF THE NEAR EDGE OF THE ADJACENT TRAVEL LANE TO THE BOTTOM OF THE SIGN UNLESS OTHERWISE DIRECTED BY THE DEPARTMENT. MOUNT ALL SIGNS STRAIGHT AND LEVEL AND WITH THE FACE OF THE SIGNS PERPENDICULAR TO THE SURFACE OF THE ROADWAY.
 - REFLECTORIZE ORANGE ADVANCE WARNING SIGNS AND ANY ORANGE AREAS OF A MULTI-COLORED ADVANCE WARNING SIGN WITH A FLUORESCENT ORANGE COLORED PRISMATIC RETROREFLECTIVE SHEETING. REFLECTORIZE WHITE REGULATORY SIGNS AND ANY WHITE AREAS OF A MULTI-COLORED ADVANCE WARNING SIGN WITH A WHITE COLORED PRISMATIC RETROREFLECTIVE SHEETING.
 - ALL TRAFFIC CONTROL DEVICES SHALL COMPLY WITH ALL NCHRP REPORT 350 REQUIREMENTS AND SHALL REQUIRE APPROVAL BY THE DEPARTMENT. ONLY THOSE TRAFFIC CONTROL DEVICES INCLUDED ON THE "APPROVED PRODUCTS LIST FOR TRAFFIC CONTROL DEVICES IN WORK ZONES" ARE CONSIDERED ACCEPTABLE FOR USE. THIS LIST MAY BE ACCESSED ON THE DEPARTMENT'S WEB SITE AT: www.scdot.org.
 - THE CONTRACTOR SHALL PROVIDE AND UTILIZE ANY SPECIAL SIGN MOUNTING ASSEMBLIES AND HARDWARE THAT MAY BE NECESSARY FOR INSTALLING AND MOUNTING SIGNS IN AREAS OF CONCRETE MEDIAN BARRIER, BRIDGE PARAPET WALLS OR DOUBLEFACED GUARDRAIL.
 - THE PRIMARY TRAFFIC CONTROL DEVICES UTILIZED FOR DAYTIME SHOULDER CLOSURES ARE 36" CONES. THE PRIMARY TRAFFIC CONTROL DEVICES UTILIZED FOR NIGHTTIME SHOULDER CLOSURES ARE PORTABLE PLASTIC DRUMS. DURING DAYTIME SHOULDER CLOSURES, 42" OVERSIZED CONES MAY BE SUBSTITUTED FOR 36" CONES. DURING NIGHTTIME SHOULDER CLOSURES, 42" OVERSIZED CONES ARE PROHIBITED FOR USE. IF THIS TRAFFIC CONTROL SETUP EXTENDS INTO THE HOURS OF DARKNESS, REPLACE ALL CONES, 36" OR 42" OVERSIZED, WITH PORTABLE PLASTIC DRUMS.
 - THE 36" CONES UTILIZED DURING DAYLIGHT HOURS ARE NOT REQUIRED TO BE REFLECTORIZED. REFLECTORIZE ALL 42" OVERSIZED CONES UTILIZED DURING DAYTIME SHOULDER CLOSURES WITH TYPE III FLEXIBLE PRISMATIC RETROREFLECTIVE SHEETING UNLESS OTHERWISE DIRECTED BY THE DEPARTMENT. REFLECTORIZE ALL PORTABLE PLASTIC DRUMS WITH TYPE III FLEXIBLE PRISMATIC RETROREFLECTIVE SHEETING UNLESS OTHERWISE DIRECTED BY THE DEPARTMENT.
 - THE DEPARTMENT PROHIBITS CONDUCTING WORK ON PRIMARY AND SECONDARY ROUTES WITHIN 1' OF THE NEAR EDGE OF THE ADJACENT TRAVEL LANE UNDER A SHOULDER CLOSURE. ALL WORK THAT MAY REQUIRE THE PRESENCE OF EQUIPMENT, PERSONNEL, MATERIALS OR WORK VEHICLES WITHIN 1' OF THE NEAR EDGE OF THE ADJACENT TRAVEL LANE SHALL BE CONDUCTED UNDER A LANE CLOSURE.
- CASE I: WHENEVER ANY PORTION OF THE SHOULDER AREA WITHIN 15' BUT NOT CLOSER THAN 1' OF THE NEAR EDGE OF THE ADJACENT TRAVEL LANE MUST BE OCCUPIED BY EQUIPMENT, PERSONNEL, MATERIALS OR WORK VEHICLES TO CONDUCT THE WORK, INSTALL AND MAINTAIN THE SIGNING AND TRAFFIC CONTROL DEVICES AS ILLUSTRATED.
- CASE II: WHENEVER THE WORK IS CONDUCTED BEYOND 15' BUT WITHIN 30' OF THE NEAR EDGE OF THE ADJACENT TRAVEL LANE, INCLUDING THE PRESENCE OF EQUIPMENT, PERSONNEL, MATERIALS OR WORK VEHICLES, INSTALL AND MAINTAIN THE SIGNING AND TRAFFIC CONTROL AS ILLUSTRATED.
- CONDUCT THE WORK IN SUCH A MANNER THAT WILL NOT REQUIRE ENCROACHMENT OF TRAFFIC CONTROL DEVICES, EQUIPMENT, PERSONNEL, MATERIALS OR ANY WORK RELATED VEHICLES WITHIN 1' OF THE NEAR EDGE OF THE ADJACENT TRAVEL LANE.
 - PLACE THE TRUCK MOUNTED ATTENUATOR AT A LOCATION 100' IN ADVANCE OF THE WORK ACTIVITY AND NO CLOSER THAN 1' FROM THE NEAR EDGE OF THE ADJACENT TRAVEL LANE.
 - FOR A CASE I SCENARIO IN THE RIGHT SHOULDER AREA, ADJUST THE TAPER AS NECESSARY TO FIT THE WIDTH OF THE SHOULDER WHILE MAINTAINING THE REQUIRED 250' TAPER LENGTH.
 - IF WORK IS BEING CONDUCTED SIMULTANEOUSLY AT TWO DIFFERENT LOCATIONS AT THE SAME TIME UNDER CASE I SHOULDER CLOSURES, SEPARATE THE TWO LOCATIONS BY NO LESS THAN 1 MILE FROM THE END OF THE FIRST CASE I CLOSURE THAT A MOTORIST WILL ENCOUNTER TO THE BEGINNING OF THE TAPER OF THE SECOND CASE I CLOSURE. A MINIMUM SEPARATION DISTANCE OF ONE-HALF MILE IS RECOMMENDED BETWEEN SHOULDER CLOSURES WHEN ONE OR BOTH SHOULDER CLOSURES IS A CASE II CLOSURE.
 - THE DEPARTMENT RESERVES THE RIGHT TO RESTRICT WORK OPERATIONS AND/OR WITHHOLD THE MONTHLY ESTIMATE IF THE TRAFFIC CONTROL IS NOT PROPERLY INSTALLED AND MAINTAINED AS DIRECTED BY THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, THE STANDARD DRAWINGS, THE PLANS AND/OR THE ENGINEER.
 - THIS TYPICAL TRAFFIC CONTROL SETUP APPLIES TO THE INSTALLATION OF SHOULDER CLOSURES IN THE RIGHT SHOULDER AREAS OF PRIMARY AND SECONDARY ROADWAYS.



PORTABLE TRUCK MOUNTED ATTENUATOR

- UTILIZE A TRUCK MOUNTED ATTENUATOR ATTACHED TO THE REAR OF A TRUCK WITH A MINIMUM GROSS VEHICULAR WEIGHT (GVW) OF 15,000 POUNDS (ACTUAL WEIGHT). IF THE ADDITION OF SUPPLEMENTAL WEIGHT TO THE VEHICLE AS BALLAST IS NECESSARY, CONTAIN THE MATERIAL WITHIN A STRUCTURE CONSTRUCTED OF STEEL. CONSTRUCT THIS STEEL STRUCTURE TO HAVE A MINIMUM OF FOUR SIDES AND A BOTTOM. A TOP IS OPTIONAL. BOLT THIS STRUCTURE TO THE FRAME OF THE TRUCK. UTILIZE A SUFFICIENT NUMBER OF FASTENERS FOR ATTACHMENT OF THE STEEL STRUCTURE TO THE FRAME OF THE TRUCK TO ENSURE THE STRUCTURE WILL NOT SEPARATE FROM THE FRAME OF THE TRUCK DURING AN IMPACT UPON THE ATTACHED TRUCK MOUNTED ATTENUATOR. UTILIZE EITHER DRY LOOSE SAND OR STEEL REINFORCED CONCRETE FOR BALLAST MATERIAL WITHIN THE STEEL STRUCTURE TO ACHIEVE THE NECESSARY WEIGHT. THE BALLAST MATERIAL SHALL REMAIN CONTAINED WITHIN THE CONFINES OF THE STEEL STRUCTURE AND SHALL NOT PROTRUDE FROM THE STEEL STRUCTURE IN ANY MANNER.
- LOCATE THE TRUCK MOUNTED ATTENUATOR 100 FEET IN ADVANCE OF THE WORK AREA UNLESS OTHERWISE SPECIFIED.
- PROVIDE, INSTALL AND MAINTAIN THE TRUCK MOUNTED ATTENUATOR AS SPECIFIED BY THE STANDARD SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER.

ADVANCE WARNING ARROW PANEL

ALL ADVANCE WARNING ARROW PANELS SHALL BE 48" x 96" WITH A MINIMUM LEGIBILITY DISTANCE OF 1 MILE. PLACEMENT OF AN ADVANCE WARNING ARROW PANEL MAY REQUIRE ADJUSTMENTS DUE TO HORIZONTAL AND/OR VERTICAL ALIGNMENT OR OTHER SIGHT DISTANCE RESTRICTIONS. THE PANEL FACE SHALL BE NONREFLECTIVE BLACK. ALL ADVANCE WARNING ARROW PANELS SHALL COMPLY WITH THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, LATEST EDITION.

WHEN AN ADVANCE WARNING ARROW PANEL IS REQUIRED TO OPERATE IN THE CAUTION MODE, THE ADVANCE WARNING ARROW PANEL SHALL DISPLAY THE "FOUR CORNERS" CAUTION MODE, WITH ONE LAMP IN EACH CORNER. DISPLAY OF ANY OTHER TYPE OF CAUTION MODE OTHER THAN THE "FOUR CORNERS" CAUTION MODE SUCH AS THE "FLASHING BAR" OR THE "ALTERNATING DIAMOND" CAUTION MODES ARE UNACCEPTABLE AND PROHIBITED.

LEGEND

○ 36" TRAFFIC CONES

WORK ZONE TRAFFIC CONTROL ENGINEER



Willie F. McConnell
SIGNATURE
8/2/12
DATE

6			
5			
4			
3			
2			
1	8-12-11	JCS	GENERAL UPDATE
0	8-23-07	JCS	DRAWING NO. UPDATE
#	DATE	CHK	DESCRIPTION



SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DESIGN STANDARDS OFFICE
955 PARK STREET
ROOM 405
COLUMBIA, SC 29201

STANDARD DRAWING

RIGHT SHOULDER CLOSURE (CASE I / CASE II) PRIMARY ROUTES

610-205-00
EFFECTIVE LETTING DATE: 5/11/2013

THIS DRAWING IS NOT TO SCALE

**DORCHESTER COUNTY WATER & SEWER
BID SCHEDULE**

Maple Street Force Main Relocation
Bid Form

Item No.	Item Description	Est Qty	Unit	Unit Price	Total Bid Price
1	Mobilization	1	LS		
4" Force Main Relocation					
2	4" PVC Force Main	795	LF		
3	4" PVC Force Main – Restrained Joint	195	LF		
4	4" PVC Force Main Installed in Steel Casing – Restrained Joint	210	LF		
5	18" Steel Casing Installed by Open Trench	90	LF		
6	18" Steel Casing Installed by Jack and Bore	120	LF		
7	90° Bend	3	EA		
8	45° Bend	2	EA		
9	22.5° Bend	4	EA		
10	8"X4" Reducer	1	EA		
11	Connection to Existing Force Main	1	LS		
12	Connection to Existing Manhole	1	LS		
13	Line Existing Discharge Manhole and Next Two Downstream Manholes	1	LS		
14	Abandon Manhole (Sta 8 + 75)	1	LS		
15	Air Release Valve in Manhole	1	EA		
Sewer Services on Existing Sewer					
16	6" PVC Sewer Service Lateral Pipe	1,100	LF		
17	Single Clean Out Installation	13	EA		
18	Double Clean Out Installation	2	EA		
19	Single Clean Out (Betterment)	2	EA		
20	Single Clean Out into Manhole-Core (Betterment)	1	EA		
21	Double Clean Out (Betterment)	1	EA		
22	Clean Out Relocation	3	EA		
23	Abandon Clean Out	4	EA		
24	Locating Sewer Service Pipe	20	EA		
25	Sewer Service Pipe Elevation Change	3	EA		
8" Gravity Sewer Extension (North Maple St.)					
26	8" PVC Gravity Sewer (8-10 depth)	49	LF		
27	4' Manhole (8-10 depth)	1	EA		
28	Connection to Existing Manhole	1	LS		

Item No.	Item Description	Est Qty	Unit	Unit Price	Total Bid Price
8" Gravity Sewer Extension (US 78/W 5th N St.)					
29	8" PVC Gravity Sewer (0-6 depth)	582	LF		
30	8" PVC Gravity Sewer (6-8 depth)	392	LF		
31	8" PVC Gravity Sewer (8-10 depth)	95	LF		
32	4' Manhole (0-6 ft depth)	6	EA		
33	4' Manhole (6-8 ft depth)	1	EA		
34	4' Manhole (8-10 ft depth)	1	EA		
35	Doghouse Manhole & Tie in to Existing	1	LS		
36	Driveway Removal and Repair – Concrete (2 Driveways)	23	SY		
37	Driveway Removal and Repair - Asphalt	4	SY		
38	Driveway Removal and Repair - Gravel	23	SY		
39	6" PVC Sewer Service Lateral Pipe	150	LF		
40	Single Clean Out Installation	7	EA		
41	Single Clean Out into Manhole-Core	1	EA		
42	Double Clean Out Installation	1	EA		
43	Abandon Clean Out	8	EA		
44	Abandon 8" Gravity Sewer (311 LF)	1	LS		
45	Abandon Manhole (Sta 9 + 65)	1	LS		
46	Tree Removal (2 Trees)	1	LS		
SCDOT Road Work for FM and Gravity					
47	SCDOT Road Pavement Cut and Repair	40	SY		
48	Traffic Control	1	LS		
Testing					
49	Soil Compaction Testing	1	LS		

TOTAL BID PRICE _____

**DORCHESTER COUNTY WATER & SEWER
PERMITS**

Wastewater Construction Permit

Bureau of Water



PROJECT NAME: Maple Street Force Main Relocation	COUNTY: Dorchester
LOCATION: W 5th N Street (HWY 78) and Maple Street	

PERMISSION IS HEREBY GRANTED TO: Dorchester County Water and Sewer Department
235 Deming Way
Summerville, SC29483

For the construction of a sanitary sewer system in accordance with the construction plans, specifications, design calculations and the Construction Permit Application signed by Walt Fletcher, W.K. Dickson & Co., Inc., Registered Professional Engineer, S.C Registration Number: 26989.

Project Description: The installation/relocation of approximately 1,118 LF of 8" gravity sewer main, ten (10) manholes and necessary appurtenances to serve existing residential lots.

TREATMENT FACILITY: The wastewater will be discharged to the DORCHESTER CO LOWER DORCHESTER WWTP - SC0038822 at a design flow rate of 0 GPD.

STANDARD CONDITION:

NOTE: In accepting this permit, the owner agrees to the admission of properly authorized persons at all reasonable hours for the purpose of sampling and inspection. This is a permit for construction only and does not constitute DHEC approval, temporary or otherwise, to place the system in operation. An Approval to Place in Operation is required and can be obtained following the completion of construction by contacting the Lowcountry EA Charleston at 843-953-0150. Additional permits may be required prior to construction (e.g., Stormwater).

SPECIAL CONDITIONS:

- See attached (to original construction permit) DHEC Office of Ocean and Coastal Resource Management (DHEC-OCRM) certification for additional conditions related to the Coastal Zone Consistency determination.
- This construction permit is being issued based on the technical review being provided by the DORCHESTER COUNTY PUBLIC WORKS under the Delegated Review Program. An approval to place in operation will not be granted if there are certain deficiencies that are noted regarding the requirements of R.61-67.
- All construction/materials for this project must conform to the Standard Specifications for DORCHESTER COUNTY PUBLIC WORKS.

PERMIT NUMBER:	WW043847
ISSUANCE DATE:	February 7, 2022
EXPIRATION DATES:	Construction must be completed and the Approval to Place in Operation granted prior to February 7, 2025 or this permit will expire.

Douglas B. Kinard, P.E., Director
Drinking Water and Recreational
Waters Protection Division

BS(DRP)

**SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
Encroachment Permit**

Permit No : 249229

Permit Decision Date :
10/22/2021

Expiration Date : 10/22/2022

Type Permit : SEWER

Location:

<u>District</u>	<u>Work County</u>	<u>Type</u>	<u>Route</u>	<u>Aux</u>	<u>Begin MP</u>	<u>End MP</u>
6	Dorchester, SC	S-	131	None	0.517	0.517
6	Dorchester, SC	US	78	None	34.597	34.891

Contact Information

Applicant: DorchesterCountyWaterandSewer

Phone:

Contact: Walt Fletcher

Address: 235 Deming Way,

City: Summerville

State: SC

Zip: 29483

Comments

Force main relocation to connect to existing force main near the intersection of Winter Drive and N Maple Street. Force main to discharge at existing manhole on the South-eastern side of N Maple St near the intersection of N Maple St and US-78. Gravity sewer extension to occur in the right of way of N Maple St near the intersection of Maple St and WassamassawRd(CONTINUED ON ADDENDUM)

Special Provisions:

9999 - See Attached for Additional Special Provisions

Customer Agreement

APP#
98431

3. The undersigned applicant hereby requests the SCDOT to permit encroachment on the SCDOT right of way as described herein. It is expressly understood that the encroachment, if and when constructed, shall be installed in accordance with the sketch attached hereto and made a part hereof. The applicant agrees to comply with and be bound by the SCDOT's "A Policy for Accommodating Utilities on Highways Rights of way", "Standard Specifications for Highway Construction", the "General Provisions" and "Special Provisions", attached hereto or made a part hereof by reference, during the installation, operation and maintenance of said encroachment within the SCDOT's Right of Way. **DISCHARGES OF STORM WATER AND NON-STORM WATER:** Work within State Highway right-of-way shall be conducted in compliance with all applicable requirements of the National Pollutant Discharge Elimination System (NPDES) permit(s) issued to the Department of Transportation (Department), to govern the discharge of storm water and non-storm water from its properties. Work shall also be in compliance with all other applicable Federal, State and Local laws and regulations, and with the Department's Encroachment Permits Manual and encroachment permit. The encroachment permit will not be issued until the applicant has received an NPDES construction permit from SC Department of Health and Environmental Control.

The applicant agrees to comply with all current SCDOT Standards Specifications for Highway Construction including all Supplemental Technical Specifications. The applicant hereby further agrees, and binds his/her/its heirs, personal representatives, successors, assigns, to assume any and all liability for accidents or injuries to persons, or damage to property, including the highway, that may be caused by the construction, maintenance, use, moving or removing of the physical appurtenances contemplated herein.

Applicant's Name: Jason Coffman Date: 9/20/2021

(Please print or type)

Applicant's Sig: *Jason Coffman* Title: Senior Water and Sewer Engin

For Office Use Only

For Office Use Only

In accordance with your request and subject to all the provisions, terms, conditions, and restrictions stated in the application and the general and special provisions attached hereto, the SCDOT hereby approves your application for an encroachment permit. This permit shall become null and void unless the work contemplated herein shall have been completed prior to:

See Attached Special Provision and/or Permit Requirements

NPDES Permit

Nbr: _____

(Date received by res. Maint. Engg.)

(SCDOT Approval)

(Date)

ASR

10-21-21

9999 SPECIAL PROVISIONS

Sewer

The South Carolina Department of Transportation reserves the right to impose additional conditions, provisions, and/or requirements on this permit to respond to any unforeseen, specific problems that might arise during the life of this permit, and to take any enforcement action necessary to ensure compliance with SCDOT specifications, standards, or policies.

If in the future the proposed utility work to be performed under this permit is requested to be removed by the SCDOT because of roadway improvements and the facilities are left in place by the permittee, and the improvements are made and the facilities are then located under new pavement or construction, any future access, taps, ties, or maintenance on the covered facilities may be denied by SCDOT.

All of the following provisions may not apply to work being performed under this permit. Any provision listed below along with those stated on the application form, and any other provision added to and made part of this permit, will be required to be executed to the extent expressed in these provisions.

The permittee fully understands and agrees with all conditions, requirements, provisions, and specifications associated with or listed on this permit with the start of any construction described or shown on this permit.

This permit has been approved with one year life duration; all work shown or detailed on this permit must be completed and accepted in that time frame. If all of the work is not finished the permit will be considered in noncompliance and the permittee will be legally responsible for any actions which may result from the construction deficiencies.

Approval of this permit is for the relocation of sewer facilities within the right-of-way of N. Maple St. (S-18-131) and US78. All shown on the plans.

- **Let it be known that this utility company will need to coordinate with other utilities that may be in the vicinity. This concurrence does not relieve them of conflicts with other utilities. They will also need to make sure that they will be underneath our storm drain and all minimum vertical and horizontal clearances are met per standard. In addition, they need to ensure that the proposed driveway elevations align with all the improvements which includes but limited to sidewalk, roadway, curb and gutter.**
- **The South Carolina Department of Transportation reserves the right to impose additional conditions, provisions, and/or requirements on this permit to respond to any unforeseen, specific problems that might arise during the life of this permit, and to take any enforcement action necessary to ensure compliance with SCDOT specifications, standards, or policies.**
- **If in the future the facilities left in place by the permittee and the facilities are located under new pavement or construction, any future access, taps, ties, or maintenance on the covered facilities may be denied by SCDOT.**
- **All of the following provisions may not apply to work being performed under this permit. Any provision listed below along with those stated on the application form, and any other provision added to and made part of this permit, will be required to be executed to the extent expressed in these provisions.**

- The permittee fully understands and agrees with all conditions, requirements, provisions, and specifications associated with or listed on this permit with the start of any construction described or shown on this permit.
- **Prior to the start of any work shown on this permit the permittee, the contractor, and SCDOT will meet on site to discuss proposed work, these provisions, and all required safety requirements and signage pertaining to this permit.**
- Traffic Control to follow SCDOT Standard Drawing 610-005-00 for a Flagging Operation.
- **Traffic Control to follow SCDOT Standard Drawing 610-205-00 for a Shoulder Closure (Case II).**
- This office is to be notified a minimum of 24 hours prior to any work inside SCDOT rights-of-way being started by calling, faxing or emailing the Permit Construction Notification form or by immediately calling if an accident should occur during this construction. (843) 563-3451
- All driveways cut during installation of utility lines will be restored and completely patched immediately to ensure property owner's access, and shall meet all South Carolina Department of Transportation specifications that apply. Each driveway will be patched with the same material used in the construction of the driveway. Concrete driveways will be cut at an existing joint or at a location that will not leave small areas of less than 4'-0" between patch edge and existing joint or edge of pavement.
- If any settlement occurs within the open cut driveways, the permittee shall repair the settled area and provide an overlay of asphalt covering the entire driveway.
- Backfilling of trenches is to be accomplished immediately after placement of pipe.
- Any installation of this water/sewer main between the ditch line and edge of pavement must have a cover depth of 42 inches below the top of pavement.
- Any installation of this water/sewer main between the ditch line and right-of-way line must have a minimum cover depth of 36 inches.
- The utility company to the extent required by law shall hold harmless the Department, its employees, contractors and agents, from any damages caused to the utility installations by routine maintenance operations. The utility company shall be responsible for any damages it causes to other utility installations on the Department right-of-way.
- All pavement markings (edge line and/or center line) shall be restored to SCDOT standards and specifications.
- Any existing pavement markings or traffic signage altered during the installation of this permitted construction will be replaced by the permittee to their original condition as soon as possible. All existing and required construction signage will be maintained at all times during this permit.
- **No trenches or open excavations are to be left open overnight.**
- All areas disturbed inside SCDOT rights-of-way are to be compacted, graded and grassed as soon as possible to prevent any erosion or sedimentation in the drainage system.
- Any sidewalk or curbing damaged or removed during construction must be replaced by the permittee to SCDOT standards and specifications.
- All construction signage is to be placed and maintained during the construction of this project until SCDOT final approval of work is given for all work shown on this permit. All signage is the responsibility of the permittee.

- No excavated material is to be placed or let accumulate on roadway surface during the construction of this project. All material is to be removed from roadway as soon as possible.
- **Any excavation within 5' of the edge of pavement will be backfilled entirely with flowable fill. The excavated area will be backfilled entirely with flowable fill.**
- Any boring operation being made on this project shall be made by method shown in permit and in such a manner as not to disturb the existing pavement. The bore pit must not be any closer than five to six feet from the edge of pavement and constructed as detailed in provision number 8. The cover over the casing shall not be less than 48 inches at any point in the casing length from the lowest point of the roadway cross sections to the top of the casing. Notice will be given to the South Carolina Department of Transportation a minimum of 24 hours prior to the start of the boring operation, and immediately if the bore turns and damages the existing roadway pavement or shoulders in any way.
- Bore pits shall be closed immediately after installation. Disturbed area will be backfilled in 6" lifts, compacted as required, graded to provide positive drainage, raked, and cleared of all debris, then grassed as required.
- This office is to be notified 24 hours prior to the start of any boring or open roadway cut operation is to begin. All necessary equipment and materials needed to accomplish these tasks are to be on site, and inspected by SCDOT inspector prior to the start of each operation. This also includes all traffic control devices and signage. Call (843) 563-3451

UTILITY LINE CONSTRUCTION PROVISIONS

- 1.) All work to be performed under this permit will be in accordance with South Carolina Department of Transportation manual "A Policy for Accommodating Utilities on Highway Right-of-way", latest edition.
- 2.) All underground utility lines are to be placed as indicated on attached drawings or detailed in the permit. The line is to be placed in a uniform distance either off edge of roadway or right-of-way lines with the least amount of deflective changes as possible. All lines are to be buried with a minimum cover as shown on drawings or indicated in the permit.
- 3.) Contractor will maintain access to all property owners at all times during construction, and until final inspection, and approval is obtained. If in the course of construction driveways are to be cut and access impaired the contractor will be responsible to inform each resident of the inconvenience and the time, date and length of the work to be done.
- 4.) All utility valves, meters, vaults, air release valves, manholes, and others utility structures are to be installed outside existing or proposed roadway surface, flush with the existing ground, and behind ditches if at all possible, and/or 3'-0" inside the right-of-way lines.
- 5.) Any existing pavement markings or traffic signage altered during the installation of this permitted construction will be replaced by the permittee to their original condition as soon as possible. All existing and required construction signage will be maintained at all times during this permit. Some new construction will require new pavement markings and permanent signage, see permit for details.
- 6.) Any request for a final inspection of a utility project will be made by either sending this office a letter or email requesting final inspection or by calling and requesting the inspection.

UTILITY LINE BORING PROVISIONS

- 7.) Any boring operation being made on this project shall be made by method shown in permit and in such a manner as not to disturb the existing pavement. The bore pit must not be any closer than five to six feet from the edge of pavement and constructed as detailed in provision number 8. The cover over the casing shall not be less than 48 inches at any point in the casing length from the lowest point of the roadway structure to the top of the casing. Notice will be given to the South Carolina Department of Transportation a minimum of 24 hours prior to the start of the boring operation, and immediately if the bore turns and damages the existing roadway pavement or shoulders in any way.
- 8.) At all locations of jack and bore crossings, casing will extend from right-of-way line to right-of-way line. Boring pit location will be determined by the depth of boring, i.e. the distance from edge of pavement to the front edge of the pit will be the same or greater than the depth of line crossing, minimum of five or six feet.
- 9.) Bore pits shall be closed immediately after installation. Disturbed area will be backfilled in 6" lifts, compacted as required, graded to provide positive drainage, raked, and cleared of all debris, then grassed as required.
- 10.) This office is to be notified 24 hours prior to the start of any boring or open roadway cut operation is to begin. All necessary equipment and materials needed to accomplish these tasks are to be on site, and inspected by SCDOT inspector prior to the start of each operation. This also includes all traffic control devices and signage. Call (843) 761-8481

PAVEMENT PROVISIONS

- 11.) Any pavement to be used in the construction shown on this permit is to be placed as specified and in accordance with the South Carolina Department of Transportation standard specifications for highway construction (latest edition), whichever is greater. The pavement structure listed or shown will be used in all areas where asphalt is to be placed inside SCDOT right-of-way unless indicated differently on the permit.
- 12.) Any existing roadway pavement damaged or removed in connection with this work will be replaced, using the same thickness and type of material destroyed, or according to specifications called for in the South Carolina Department of Transportation construction manual (latest edition), whichever is greater.
- 13.) Where pavement is cut and replaced, the contractor shall cut the edges to a straight and even line before removing the pavement. No ragged edges will be allowed or accepted. All patches and repairs will have squared corners. Prior to placing new asphalt all existing edges are to be tacked as per current SCDOT specifications. In some cases an asphalt surface overlay may be required to smooth riding surface of roadway at patch, see permit for details.
- 14.) Where roadway pavement is cut and is to be replaced, the trench is to be backfilled with SCDOT approved flowable fill from top of pipe to riding surface, and steel plating is to be placed over cut and secured as required. Then maintained until backfill has setup and then surface treatment can to be placed. The top two inches (minimum) of flowable fill is to be removed and the equivalent amount and type of existing roadway asphalt (minimum two inches) is to be placed in patch.

EXCAVATION PROVISIONS

- 15.) Any required excavation or mucking in connection with this work, will be backfilled in six inch layers, and thoroughly compacted in a manner satisfactory to the South Carolina Department of Transportation specifications. Density tests may be required with the

results to be furnished to the departments utility inspector on a weekly basis during construction, see permit for details.

- 16.) Compaction requirements in these provisions apply to crosscuts and longitudinal trench cuts from shoulder break to shoulder break. If compaction tests are required the maximum distance between tests shall be 500 feet. In some cases additional tests may be required, see permit for details.
- 17.) If unsuitable material is excavated, it will not be put back in the excavation, and will be removed from the right-of-way as soon as possible. The material will be replaced with suitable approved backfill, and be in compliance with the South Carolina Department of Transportation specifications for backfill.
- 18.) There shall be no excavation of soil nearer than two feet from any public utility pole or appurtenant facility without the written consent of the owner thereof. Special permission of the South Carolina Department of Transportation after an opportunity to be heard is given the owner of such pole or appurtenant facility may be given.
- 19.) If the side of the trench, pit, or any excavation is less than 3'-0" from the existing edge of pavement, the excavated area will be backfilled entirely with flowable fill to an elevation 6 inches from the existing ground elevation. Then brought to grade with suitable topsoil, compacted, graded, and grassed as required to eliminate any erosion.
- 20.) Existing ditch slopes, if excavated, shall be backfilled in six inch layers and well tamped with a mechanical tamp to 95% density (standard proctor). These lifts will be benched into the existing embankment as required. The new slopes will then be graded to match existing typical roadway cross section.
- 21.) No excavated material or spoil is to be placed on the pavement without the permission of the South Carolina Department of Transportation, and if permission is granted, this material must be removed daily, as soon as possible. The roadway is to be cleaned of all material in a manner as to protect the existing pavement. Any pavement destroyed, or marked by this operation will be removed and replaced as required.
- 22.) When shoulders and ditch slopes are reshaped and graded to a typical section, the section will match existing road section. Where the existing section is less than state standards (6' wide shoulder @ 12:1, front slope of ditch @ 4:1, ditch bottom as required to accommodate existing runoff, and back slope of ditch min. 3:1 or to right-of-way line) the section will be upgraded to the standard. In either case positive drainage must be established and approved by SCDOT.
- 23.) Contractor will maintain positive drainage at all times during construction and until final inspection and approval from South Carolina Department of Transportation is obtained.
- 24.) No excavation located between the edge of roadway pavement and the center of sideline ditch or 15'0" where no ditch is present is to be left open overnight. The excavation is to be either temporarily backfilled or a steel plate is to be secured over hole. In either case reflective traffic cones are to be placed around the area of the excavation until the excavation has been permanently backfilled as required and graded.

CONSTRUCTION CLEANUP PROVISIONS

- 25.) All areas in SCDOT right-of-way disturbed during construction are to be restored to original condition as soon as possible and maintained during entire length of project,
- 26.) All disturbed areas inside SCDOT rights-of-way will be seeded with a mixture of grass seed as specified in the South Carolina Department of Transportation standard specifications for highway construction, section 109b2, or latest edition. No rye grass will be allowed inside SCDOT rights-of-way. A satisfactory stand of grass will be required, prior to any acceptance or final approval is granted on this permit.

- 27.) All rocks, pebbles, boards, other debris along with any spoil material will be kept clear of roadway at all times as the work progresses.

TRAFFIC CONTROL PROVISIONS

- 28.) The permittee, owner, and/or contractor will be responsible for all required traffic control for this construction. SCDOT will be available for any questions concerning the required signage, types, size and placement.
- 29.) Any time personnel or equipment is required to be inside right-of-way. Signs are to be covered or removed each night or if no activity is present inside right-of-way.
- 30.) All men working in the SCDOT right-of-way will wear approved safety vests as required.
- 31.) Traffic control, lights, signs, and flagmen will be furnished by the permittee and/or contractor and will conform to "Manual on Uniform Traffic Control Devices", latest edition. All devices and signs will be maintained during all phases of construction. Signs not in use will be removed or covered as required.**

GENERAL PROVISIONS

- 32.) All work to be performed under this permit will be in accordance with South Carolina Department of Transportation specifications, latest edition.
- 33.) All work indicated on this permit is to be completed within one (1) year of the approval date of the permit. All utility line construction is to include the surface treatment and all shoulder and ditch stabilization required.
- 34.) All roadway and work performed in the SCDOT right-of-way under this permit including any utility installations will be the responsibility of the owner for the life of the utility placed. If for any reason the utility line fails, this office is to be notified immediately. If in the construction of the project detailed on the permit, the roadway or right-of-way construction or any part of that construction is performed in a manner not specified in the permit or according to SCDOT standards or specifications shall be corrected immediately.
- 35.) Appropriate South Carolina Department of Transportation officials will be notified as of the start of any construction on this project, 24 hours prior to the start, and be kept informed of the progress during construction, and when a final inspection is wanted at the completion of the project.
- 36.) A reliable, properly insured, and licensed contractor will perform this construction.
- 37.) Any construction materials or equipment to be stored or parked alongside of roadway or in the right-of-way will be placed a minimum of 30' from the edge of pavement, or have warning devices as required and approved by this office.
- 38.) Field changes, if necessary must be submitted in writing and approved prior to the start of any actual construction on proposed change. An as-built set of plans will be required upon completion of the project reflecting any and all changes to the original plans.
- 39.) If a time extension or a revision to an approved permit is required, a written request along with any drawings required is to be submitted to this department for review and approval. No work is to be performed on any item not indicated on the permit, either shown in a sketch or indicated in a description, prior to an amended permit being issued.
- 40.) The permittee shall be responsible for any and all damages that occur as a direct result of this installation.
- 41.) A copy of this approved permit will be made available to the South Carolina Department of Transportation at the work site at all times.

**DORCHESTER COUNTY WATER & SEWER
REQUEST TO OPEN CUT DOCUMENTATION**

Whittle, Bradley

From: Burton, Daniel <BurtonD@scdot.org>
Sent: Monday, March 30, 2020 3:48 PM
To: Whittle, Bradley
Cc: Oliver, Yvette; Wickenhoefer, Samuel T.; Guess, Turner B
Subject: EXTERNAL: RE: Project ID P030733 S-131 (North Maple Street) Dorchester County - Open Cuts

Brad-As discussed and based upon our conversation, I am agreeable to the open cuts noted below. Please see below requirements:

- All District 6 lane closure restrictions shall be adhered to (<https://www.scdot.org/business/pdf/accessMgt/trafficEngineering/PrimaryHourRestrictions.pdf>). All pertinent SCDOT lane/shoulder closure drawings shall be adhered to.
- Top of water/sewer lines shall be placed at least 2.5 ft. below all proposed drainage installations (invert). Additionally, top of water/sewer lines should be located a minimum of 2ft. below bottom of proposed subgrade to allow for any potential mucking or geotechnical improvements needed.
- Suggest having representatives(s) from water/sewer companies present(post-placement) while placing drainage installations in close proximity (or other close proximity excavation work) to newly placed utility lines.
- Existing drainage patterns should be maintained or accounted for during utility installations.

Please let me know if you have any further questions.

Thanks,

Daniel Burton, PE

District Construction Engineer
SCDOT-District 6
Office: (843) 746-6727
Cell: (843) 371-0342



From: Whittle, Bradley <Bradley.Whittle@mbakerintl.com>
Sent: Wednesday, March 25, 2020 4:13 PM
To: Burton, Daniel <BurtonD@scdot.org>
Subject: FW: Project ID P030733 S-131 (North Maple Street) Dorchester County - Open Cuts

*** This is an EXTERNAL email. Please do not click on a link or open any attachments unless you are confident it is from a trusted source. ***

Daniel,

Just wanted to follow up to see if you had a chance to review the open-cuts proposed by Summerville CPW and DCW&S. I added one open cut that I had originally missed, which is on Sheet 6. Please let me know if you agree with

their overall approach, and what restrictions may apply if allowed. Open cuts that are proposed are marked on the attached sheets as "OC".

Proposed open-cut crossings are as follows:

- S-131 (North Maple) – CPW 12" waterline crossing (Sheet 6)
- S-65 (Richardson Avenue) - CPW 12" waterline crossing (Sheet U9)
- S-131 (North Maple) - CPW 16" waterline crossing (Sheet U13)
- S-131 (North Maple) – DCW&S 4" Forced Main (Sheet U14)
- S-131 (North Maple) - CPW 6" waterline crossing (Sheet U15)
- S-131 (North Maple) - CPW 8" waterline crossing (Sheet U16)

Thanks for your help,

Brad Whittle | Utility Coordinator

700 Huger Street | Columbia, SC 29201 | [O] 803-231-3850 | [M] 803-216-4176

bradley.whittle@mbakerintl.com | www.mbakerial.com     



From: Whittle, Bradley

Sent: Thursday, March 12, 2020 11:28 AM

To: Yvette Oliver (olivery@scdot.org) <olivery@scdot.org>

Cc: Gainey, Mark <Mark.Gainey@mbakerintl.com>

Subject: RE: Project ID P030733 S-131 (North Maple Street) Dorchester County - Open Cuts

Yvette,

I may have missed a response, but I couldn't find any response weighing in on the proposed open cuts within the North Maple Street project. Has anyone at SCDOT been able to review the approach detailed below?

Thanks,

Brad Whittle | Utility Coordinator

700 Huger Street | Columbia, SC 29201 | [O] 803-231-3850 | [M] 803-216-4176

bradley.whittle@mbakerintl.com | www.mbakerial.com     



From: Whittle, Bradley

Sent: Thursday, February 20, 2020 8:48 AM

To: Yvette Oliver (olivery@scdot.org) <olivery@scdot.org>

Cc: Gainey, Mark <Mark.Gainey@mbakerintl.com>

Subject: Project ID P030733 S-131 (North Maple Street) Dorchester County - Open Cuts

Yvette,

We held our constructability review on the S-131 (North Maple Street) project in Summerville a few weeks ago. Summerville CPW (Water) and Dorchester County Water & Sewer (Forced Main) each plan jack and bore crossings for US-78, and open cuts for the smaller roads (North Maple and Richardson) due to lack of available row for bore pits on the smaller roads. CPW and DCW&S want to confirm that this approach is acceptable, and would like to get information on what restrictions for any allowed open cuts would be suggested. I have attached our notes from the meeting on the "working" u-sheets for the project to give you a better idea of the proposed locations. Open cuts are marked with "OC".

Proposed open-cut crossings are as follows:

- S-65 (Richardson Avenue) - CPW 12" waterline crossing (Sheet U9)
- S-131 (North Maple) - CPW 16" waterline crossing (Sheet U13)
- S-131 (North Maple) - DCW&S 4" Forced Main (Sheet U14)
- S-131 (North Maple) - CPW 6" waterline crossing (Sheet U15)
- S-131 (North Maple) - CPW 8" waterline crossing (Sheet U16)

Thanks for your input. Please forward as needed.

Thanks,

Brad Whittle | Utility Coordinator

700 Huger Street | Columbia, SC 29201 | [O] 803-231-3850 | [M] 803-216-4176

bradley.whittle@mbakerintl.com | www.mbakertnl.com     



DORCHESTER COUNTY WATER & SEWER STANDARD SPECIFICATIONS

TECHNICAL SPECIFICATIONS

for

Maple Street Force Main
Relocation

WKD #20180371.00.CH

Prepared for

Dorchester County
Water and Sewer Department
235 Deming Way
Summerville, SC 29483



Plans & Specifications
Prepared by

W.K. Dickson & Co., Inc.
162 Seven Farms Drive, Suite 210
Charleston, South Carolina 29492
(843) 416-5560

September 2021



Sep 15 2021 9:44 AM

SECTION 01 10 00
SUMMARY

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Contract description.
 2. Specification Conventions.

1.2 CONTRACT DESCRIPTION

Work of the Project includes relocation of approximately 1190 LF of 4-inch sewer force main and 90 LF gravity sewer main due to the widening of Maple St. A new 4-foot diameter manhole will be installed at the end of the gravity sewer extension on Maple St. The new force main includes 210 LF of steel casing of which 120 feet will be installed by jack and bore and 90 feet installed by open trenching. The relocated force main will be connected to an existing manhole located inside the pavement of Maple St. The project also includes the installation of 965 LF of 8-inch gravity sewer with five 4-foot manholes in a new utility easement parallel to the W 5th N St. (Hwy 78) right-of-way. The existing gravity along W 5th N St. will have eight (8) services/clean outs abandoned along with 311 LF of gravity main and the last manhole on that line abandoned.

- A. The relocated force main and a portion of the gravity main will be installed inside the new expanded SCDOT right-of-way. The new right-of-way will be cleared including the razing of any existing buildings prior to the beginning of construction for the relocated force main and gravity sewer.
- B. Perform Work of Contract under unit prices contract with Owner in accordance with Conditions of Contract.

1.3 SPECIFICATION CONVENTIONS

- A. These specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. The words “shall be” are included by inference where a colon (:) is used within sentences or phrases.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

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SECTION 01 17 00
Permits and Rights-of-Way

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements pertaining to the securement and payment for licenses, building permits, rights-of-way, necessary for the construction of the project.
- B. Work Not Included:
 - 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.
 - 4. Office of Ocean and Coastal Resource Management Coastal Zone Consistency Certification.
 - 5. Town of Summerville MS4 Permit and DHEC Stormwater NOI.
 - 6. BCDCOG (208-Certification),

1.2 SUBMITTALS

- A. Submit to the Engineer satisfactory evidence that all necessary licenses have been secured prior to commencing the work.

PART 2 EXECUTION

2.1 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.

2.2 BUILDING PERMITS

- A. Secure and pay for all building permits required, whether of temporary or permanent nature.

2.3 RIGHTS-OF-WAYS, 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 construction easement shown on the plans. The easement is not in all cases equidistant, each side of the centerline of the utility.
 - 1. Contact the Engineer for rights-of-way as actually obtained.
- C. The Owner will provide no right-of-way over other property.

END OF SECTION

SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Schedule of values.
- B. Applications for payment.
- C. Change procedures.
- D. Defect assessment.
- E. Unit prices.
- F. Testing and inspection allowances.

1.2 SCHEDULE OF VALUES

- A. Submit printed schedule on Document 00 62 75 Partial Pay Estimate or other approved form. Contractor's standard form or electronic media printout will be considered.
- B. Submit Schedule of Values in duplicate within 15 days after date established in Notice to Proceed.
- C. Format: Utilize Table of Contents of this Project Manual. Identify each line item with number and title of major specification Section. Identify site mobilization, bonds and insurance.
- D. Include in each line item, amount of Allowances specified in this Section. For unit cost allowances, identify quantities taken from Contract Documents multiplied by unit cost to achieve total for each item.
- E. Include within each line item direct proportional amount of Contractor's overhead and profit.
- F. Revise schedule to list approved Change Orders, with each Application for Payment.

1.3 APPLICATIONS FOR PAYMENT

- A. Submit three copies of each application on Document 00 62 75 Partial pay Estimate or other approved form. Contractor's electronic media driven form will be considered.
- B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.
- C. Submit updated construction schedule with each Application for Payment.
- D. Payment Period: Submit at intervals stipulated in the Agreement.

- E. Submit with transmittal letter as specified for Submittals in Section 01 33 00 - Submittal Procedures.
- F. Substantiating Data: When Engineer requires substantiating information, submit data justifying dollar amounts in question. Include the following with Application for Payment:
 - 1. Record documents as specified in Section 01 70 00, for review by Owner which will be returned to Contractor.
 - 2. Affidavits attesting to off-site stored products.
 - 3. Construction progress schedules revised and current as specified in Section 01 33 00 – Submittal Procedures.

1.4 CHANGE PROCEDURES

- A. Submittals: Submit name of individual authorized to receive change documents and be responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.
- B. The Engineer will advise of minor changes in the Work not involving adjustment to Contract Price or Contract Time by issuing supplemental instructions.
- C. The Engineer may issue a Notice of Change including a detailed description of proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with stipulation of overtime work required and the period of time during which the requested price will be considered valid. Contractor will prepare and submit estimate within 15 days.
- D. Contractor may propose changes by submitting a request for change to Engineer, describing proposed change and its full effect on the Work. Include a statement describing reason for the change, and effect on Contract Price and Contract Time with full documentation and a statement describing effect on Work by separate or other Contractors. Document requested substitutions in accordance with Section 00 21 13 – Instructions to Bidders.
- E. Stipulated Price Change Order: Based on Notice of Change and Contractor's fixed price quotation or Contractor's request for Change Order as approved by Engineer.
- F. Unit Price Change Order: For contract unit prices and quantities, the Change Order will be executed on fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute Work under Work Change Directive. Changes in Contract Price or Contract Time will be computed as specified for Time and Material Change Order.
- G. Work Change Directive: Engineer may issue directive, on Document 00 94 63 Change Order, signed by Owner, instructing Contractor to proceed with change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work and designate method of determining any change in Contract Price or Contract Time. Promptly execute change.
- H. Document each quotation for change in cost or time with sufficient data to allow evaluation of quotation.
- I. Change Order Forms: Document 00 94 63 Change Order

J. Execution of Change Orders: Engineer will issue Change Orders for signatures of parties as provided in Conditions of the Contract.

J. Correlation Of Contractor Submittals:

1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Price.
2. Promptly revise progress schedules to reflect change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
3. Promptly enter changes in Project Record Documents.

1.5 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of the Engineer, it is not practical to remove and replace the Work, the Engineer will direct appropriate remedy or adjust payment.

C. Individual specification sections may modify these options or may identify specific formula or percentage sum/price reduction.

D. Authority of Engineer to assess defects and identify payment adjustments is final.

E. Non-Payment For Rejected Products: Payment will not be made for rejected products for any of the following:

1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from transporting vehicle.
4. Products placed beyond lines and levels of required Work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling, and disposing of rejected products.

1.6 UNIT PRICES

A. Authority: Measurement methods are delineated in individual Specification Sections.

B. Measurement methods delineated in individual Specification Sections complement criteria of this Section. In event of conflict, requirements of individual Specification Section govern.

C. Engineer or Owner will take measurements and compute quantities accordingly. Provide assistance in taking of measurements.

D. Unit Quantities: Quantities and measurements indicated in Bid Form are for contract purposes only. Actual quantities provided shall determine payment.

1. When actual Work requires more or fewer quantities than those quantities indicated, provide required quantities at unit sum/prices contracted.

E. Payment Includes: Full compensation for required labor, products, tools, equipment, plant and facilities, transportation, services and incidentals, erection, application or installation of item of the Work, overhead, and profit.

F. Final payment for Work governed by unit prices will be made on basis of actual measurements and quantities accepted by Engineer multiplied by unit sum/price for Work incorporated in or made necessary by the Work.

G. Measurement Of Quantities:

1. Weigh Scales: Inspected, tested, and certified by applicable State Weights and Measures Department within past year.
2. Platform Scales: Of sufficient size and capacity to accommodate conveying vehicle.
3. Metering Devices: Inspected, tested, and certified by applicable State Department within past year.
4. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
5. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
6. Measurement by Area: Measured by square dimension using mean length and width or radius.
7. Linear Measurement: Measured by linear dimension at item centerline or mean chord.
8. Stipulated Sum/Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as completed item or unit of the Work.

H. Unit Price Schedule

1. Mobilization: The lump sum price bid for mobilization shall include all costs for bonds, insurance, permits, moving construction equipment to the site, and other necessary but “nonscheduled” work.
2. Force Main (PVC and PVC – Restrained Joint)
 - a. The measurement for payment for force mains will be the actual number of linear feet of pipe installed complete in-place, measured horizontally along the centerline of the pipe.
 - b. The unit price bid per linear foot for the construction of the pipe line shall include all the Contractor’s cost for the complete construction of the force main and tracer wire exclusive of items provided for elsewhere in the Bid Form.
 - c. The price bid shall include: furnishing, transporting, and installing all pipe; joints and jointing; bracing, shoring, and sheeting; excavation; constructing the specified bedding and haunching; backfilling; disposal of spoil (as required); testing, disinfecting, and flushing; and all other related and necessary materials, work, and equipment required to construct a complete operable water line accordance with the contract documents.
 - d. For the PVC – Restrained Joint item, the price bid will include the restraints for the straight run pipe joints. The joint restraints at the fittings will be include in the RJ fitting unit price items.
3. PVC Sewer

- a. The measurement for payment for wastewater lines will be actual number of linear feet of pipe installed complete in-place, measured horizontally along the centerline of the pipe.
 - b. The unit price bid per linear foot for the construction of the pipe line shall include all of the Contractor's cost for the complete construction of the gravity sewer line, exclusive of items provided for elsewhere in the Bid Form.
 - c. The price bid shall include: furnishing, transporting, and installing all pipe, fittings, and materials; furnishing and installing specials including bulkheads and outlets not otherwise provided for in the Bid Form; joints and jointing materials; blocking or restrained joint at fittings; concrete caps; bracing, shoring, and sheeting; screenings; excavation, including exploratory excavation; dewatering; constructing the specified bedding; locator tape; backfilling (method of backfill and compaction as specified); protection, adjusting, removal and replacement, and repair of aboveground and underground utilities and service connections; disposal of spoil; testing; inspection; restoration to preconstruction conditions including driveway culverts, headwalls, fences, mail boxes, etc.; grassing (if sod is not specified); and all other related and necessary materials, work, and equipment required to construct a complete operable gravity sewer line in accordance with the contract documents.
 - d. Allowable Trench Width. The allowable trench width shall be as specified in Specification Section 31 23 17.
 - e. Depth of Pipe. Pipe depth shall be as indicated in the Contract Documents. Payment will be based on the unit price bid for various depths of installation from the existing ground surface to the depth range indicated on the bid form.
4. Service laterals (short and far side)
- a. The measurement for payment for sewer laterals shall be the actual linear feet installed complete in-place from the gravity main to the bell for the clean out wye at the property line.
 - b. The Unit Price shall include furnishing the wye at the gravity main, pipe, backfilling, stone bedding, compaction, and any other items needed to complete the laterals.
5. Single and Double residential clean out sewer service connection
- a. The measurement for payment will be made at the contract unit price for each type.
 - b. The Unit Price shall include the single or double wye, cleanout piping, staking, concrete collar, stone beddings, fittings, execution, backfill, and all other items necessary to complete the installation.
6. Residential Clean Out Abandonment Sewer Service Connection
- a. The measurement for payment for residential clean out abandonment sewer service connection will be made at the actual number of clean outs abandoned.
 - b. The unit price bid for residential clean out abandonment sewer service connection shall include the cost for furnishing all labor, materials, tools, and equipment to perform work necessary for or incidental to the abandonment of clean outs.

7. Residential Clean Out Relocation Sewer Service Connection
 - a. The measurement for payment for residential clean out relocation sewer service connection will be the actual number of existing clean outs abandoned and new clean outs installed once the sewer lateral has been extended to the new right of way.
 - b. The unit price bid for residential clean out relocation sewer service connection shall include the cost for furnishing all labor, materials, tools, and equipment to perform work necessary for or incidental to the abandonment of clean outs.
8. Restrained Joint Force Main Pipe Installed Inside the Casing Pipe
 - a. The measurement for payment for the installation of restrained joint force main inside steel casing pipe shall be the actual linear feet of pipe installed complete in-place, measured horizontally along the centerline of the pipe.
 - b. The unit price bid per linear foot shall include the cost for furnishing all labor, materials, tools, and equipment to perform work necessary for or incidental to install restrained joint pipe inside the casing including pipe spacers (spiders) and joint restraints.
9. Steel Casing Pipe – Installed by Open Trench
 - a. The measurement for payment for the open trench installation of steel casing pipe shall be the actual linear feet of pipe installed complete in-place, measured horizontally along the centerline of the pipe.
 - b. The unit price bid per linear foot for the construction of the casing pipe shall include all the Contractor’s cost for the complete construction of the casing pipe exclusive of items provided for elsewhere in the Bid Form.
10. Steel Casing Pipe – Bore and Jack Installation
 - a. The measurement for payment for the bore and jack installation of steel casing pipe shall be the actual linear feet of pipe installed complete in-place, measured horizontally along the centerline of the pipe.
 - b. The unit price bid per linear foot shall include excavation of entry and exit pits, barricades, equipment, backfilling, sheeting and shoring as required, dewatering, and all other items required by the contract documents.
11. Fittings
 - a. The measurement for payment for fittings will be the actual number of each type of fitting installed complete in-place.
 - b. The unit price bid for fittings shall include the cost for furnishing all labor, materials, tools, and equipment to perform work necessary for or incidental to installation of the fittings on the force main.
 - c. The unit price bid will include the restraints at the fitting/straight pipe joint.
12. Connection to Existing Force Main
 - a. The lump sum price bid for connecting to an existing force main shall include furnishing and installing all fittings; joint restraint; excavation (including exploratory excavation) and backfilling; protection of existing utilities; and all other related and necessary materials, work and equipment required to provide an operable connection in accordance with the contract documents. Coordinate tie-ins with the Owner.
13. Connection to Existing Manhole
 - a. The lump sum price bid for connecting to an existing manhole shall include core drilling; furnishing and installing all boots; excavation (including

exploratory excavation) and backfilling; protection of existing utilities; and all other related and necessary materials, work and equipment required to provide an operable connection in accordance with the contract documents. Coordinate tie-ins with the Owner.

14. Line Existing Discharge Manhole
 - a. The lump sum price bid for lining the existing discharge manhole shall include cleaning, surface preparation, providing and installing the liner, holiday testing, and repairing any deficiencies noted during inspection and testing.
15. Air Release Valve in Pedestal
 - a. The measurement for payment for air release valves in pedestal will be the actual number of air release valves installed complete in-place.
 - b. The unit price bid for air release valves shall include the cost for furnishing all labor, materials, tools, and equipment to perform work necessary for or incidental to installation of air release valves in pedestals as shown in the Drawings.
16. SCDOT Road Pavement Cut and Repair
 - a. The measurement for payment for SCDOT road pavement cut and repair will be the actual linear feet of cut and repair installed complete in-place.
 - b. The unit price bid shall include, but not limited to, saw cutting; flowable fill; asphalt pavement and all other related and necessary materials, work and equipment required to repair public roadways in accordance with the contract documents.
 - c. Payment shall be made only for that length for which the pipeline is constructed underneath and will be based on the widths specified in the contract documents.
17. Traffic Control:
 - a. The measurement for payment for Traffic Control shall be the lump sum price stated in the Bid Schedule.
 - b. The lump sum price shall include all necessary signage, flagmen, detours, traffic control plans and related requirements of the SCDOT.
 - c. Payment shall be divided into equal monthly amounts based on price bid and scheduled duration (time) of project.
18. Manholes:
 - a. The measurement and payment for manholes shall be the actual number installed. Prices shall include the cost of excavating, purging, constructing the manholes in accordance with the plans, coating the manhole, furnishing and installing a frame and cover, steps, manhole boots, stone bedding, backfilling, compaction, and testing.
 - b. Depth of Manhole. Manhole depth shall be as indicated in the Contract Documents.
19. Point Repairs:
 - a. The lump sum price bid for point repairs shall include the furnishing and installing all PVC pipe, repair couplings, excavation (including exploratory excavation) and backfilling, protection of existing utilities; and all other related and necessary materials, work and equipment required to provide operable repairs in accordance with the contract documents. Coordinate repairs with the Owner.

PART 1 PRODUCTS - Not Used

PART 2 EXECUTION - Not Used

END OF SECTION

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SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Coordination.
- B. Field engineering.
- C. Preconstruction meeting.
- D. Progress meetings.
- E. Pre-installation meetings.
- F. Cutting and patching.

1.2 COORDINATION

- A. Coordinate scheduling, submittals, and Work of various specification sections to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify utility requirements and characteristics of operating equipment are compatible with existing utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, operating equipment.
- C. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's occupancy or partial occupancy.
- F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.3 FIELD ENGINEERING

- A. Employ Land Survey licensed in State of Project location.

- B. Locate and protect survey control and reference points. Promptly notify Engineer of discrepancies discovered.
- C. Control datum for survey is that indicated on Drawings.
- D. Submit copy of an as-built survey sealed and signed by Land Surveyor certifying elevations and locations of the Work are in conformance with Contract Documents.
- E. Maintain complete and accurate log of control and survey work as Work progresses.
- F. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- G. Promptly report to Engineer loss or destruction of reference point or relocation required because of changes in grades or other reasons.
- H. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Engineer.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 CUTTING AND PATCHING

- A. Employ skilled and experienced installer to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements affecting:
 - 1. Structural integrity of element.
 - 2. Integrity of weather-exposed or moisture-resistant elements.
 - 3. Efficiency, maintenance, or safety of element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching including excavation and fill, to complete Work, and to:
 - 1. Fit the several parts together, to integrate with other Work.
 - 2. Uncover Work to install or correct ill-timed Work.
 - 3. Remove and replace defective and non-conforming Work.
 - 4. Remove samples of installed Work for testing.
 - 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Execute work by methods to avoid damage to other Work, and to provide proper surfaces to receive patching and finishing.
- E. Cut masonry and concrete materials using masonry saw or core drill.
- F. Cut pavements using concrete saw.

- G. Restore Work with new products in accordance with requirements of Contract Documents.
- H. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.
- I. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- J. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- K. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material, to maintain original fire rating.
- L. Identify hazardous substances or conditions exposed during the Work to Engineer for decision or remedy.

END OF SECTION

SECTION 01 32 16
CONSTRUCTION SCHEDULES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Construction Schedules

1.2 Definitions

- A. “Day” – as used throughout the Contract unless otherwise stated, means calendar day.

1.3 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. Reliance upon the approved schedule
 1. The construction schedule as approved by the Engineer and Owner 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 schedule 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 activity.

1.4 SUBMITTALS

- A. Preliminary Analysis: Within 10 calendar days after the Contractor has received the Notice to Proceed, submit one reproducible copy and four prints of a preliminary construction schedule.
- B. Construction Schedule: Within 10 calendar days after the Contractor has received the Engineer’s approval to revisions of a preliminary construction schedule, submit one reproducible copy and four prints of a construction schedule.
- C. Periodic reports: On the first working day of each month following the submittal described above, submit 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 no necessarily limit indicated activities to:
 - 1. Product 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.
 - 8. Critical Path for Construction Contract Completion.

PART 3 – PRODUCTS

3.1 PRELIMINARY ANALYSIS

- A. Contents:
 - 1. Shown 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

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SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes.
 - 1. Submittal procedures.
 - 2. Product data.
 - 3. Shop drawings.
 - 4. Samples.
 - 5. Design data.
 - 6. Test reports.
 - 7. Certificates.
 - 8. Manufacturer's instructions.
 - 9. Manufacturer's field reports.
 - 10. Construction progress schedules.
 - 11. Proposed products list.
 - 12. Erection drawings.

1.2 SUBMITTAL PROCEDURES

- A. Submit number of copies Contractor requires, plus two copies Engineer will retain.
 - 1. If hard copies are submitted, electronic submittals are acceptable in .pdf file format.
- B. Deliver to Engineer at business address.
- C. For each submittal for review, allow 15 days excluding delivery time to and from Contractor.
- D. Transmit each submittal with Engineer accepted form.
- E. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.
- F. Identify Project, Contractor, subcontractor and supplier, pertinent drawing and detail number, and specification Section number appropriate to submittal.
- G. Apply Contractor's stamp signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.
- H. Schedule submittals to expedite Project. Coordinate submission of related items.
- I. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of completed Work.
- J. Allow space on submittals for Contractor and Engineer review stamps.

- K. When revised for resubmission, identify changes made since previous submission.
- L. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
- M. Submittals not requested will not be recognized or processed.

1.3 PRODUCT DATA

- A. Product Data: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

1.4 SHOP DRAWINGS

- A. Shop Drawings: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. When required by individual specification sections, provide shop drawings signed and sealed by professional engineer responsible for designing components shown on shop drawings.
 - 1. Include signed and sealed calculations to support design.
 - 2. Submit drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
 - 3. Make revisions and provide additional information when required by authorities having jurisdiction.
- D. Submit number of copies described in SUBMITTAL PROCEDURES article.

1.5 SAMPLES

- A. Samples: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Submit number of samples specified in individual specification sections; Engineer will retain one sample.
- C. Samples For Selection as Specified in Product Sections:
 - 1. Submit to Engineer for aesthetic, color, or finish selection.
 - 2. Submit samples of finishes from full range of manufacturers' standard colors, in custom colors selected, textures, and patterns for Engineer selection.

- D. Submit samples to illustrate functional and aesthetic characteristics of Products with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- E. Include identification on each sample with full Project information.
- F. Reviewed samples which may be used in the Work are indicated in individual specification sections.
- G. Samples will not be used for testing purposes unless specifically stated in specification section.
- H. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents purposes described in Section 01 70 00 - Execution and Closeout Requirements.

1.6 DESIGN DATA

- A. Submit for Engineer's knowledge as contract administrator or for Owner.
- B. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.7 TEST REPORTS

- A. Submit for Engineer's knowledge as contract administrator or for Owner.
- B. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.8 CERTIFICATES

- A. When specified in individual specification Sections, submit certification by manufacturer, installation/application subcontractor, or Contractor to Engineer.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product but must be acceptable to Engineer.

1.9 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification Sections, submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing to Engineer for delivery to Owner.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.10 MANUFACTURER'S FIELD REPORTS

- A. Submit reports for Engineer's knowledge as contract administrator or for Owner.
- B. Submit report within 72 hours of observation to Engineer for information.
- C. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.11 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial schedules within 15 days after date established in Notice to Proceed. After review, resubmit required revised data within 10 days.
- B. Submit revised Progress Schedules with each Progress Meeting or Application for Payment, but not less than monthly.
- C. Distribute copies of reviewed schedules to Project site file, subcontractors, suppliers, and other concerned parties.
- D. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.
- E. Submit computer generated Gantt chart with separate line for each major portion of Work or operation, identifying first work day of each week.
- F. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate early and late start, early and late finish, float dates, and duration.
- G. Indicate estimated percentage of completion for each item of Work at each submission.
- H. Submit separate schedule of submittal dates for shop drawings, product data, and samples. Indicate dates reviewed submittals will be required from Engineer. Indicate decision dates for selection of finishes.
- I. Indicate delivery dates for Owner furnished products and products identified under Allowances if required.
- J. Revisions To Schedules:
 - 1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
 - 2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
 - 3. Prepare narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect, including effect of changes on schedules of separate contractors.

1.12 PROPOSED PRODUCTS LIST

- A. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.13 ERECTION DRAWINGS

- A. Submit drawings for Engineer's knowledge as contract administrator or for Owner.
- B. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.
- C. Data indicating inappropriate or unacceptable Work may be subject to action by Engineer or Owner.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

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SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Quality control and control of installation.
 - 2. Tolerances.
 - 3. References.
 - 4. Testing and inspection services.
 - 5. Manufacturers' field services.
 - 6. Labeling.
 - 7. Mock-up requirements.
 - 8. Examination.
 - 9. Preparation.

1.2 QUALITY CONTROL AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. When manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons qualified to produce required and specified quality.
- F. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.3 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. When manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

- C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

- A. For products or Work specified by association, trades, or other consensus standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date for receiving Bids, (date of Owner-Contractor Agreement when there are no Bids), except where specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.
- D. When specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.
- E. Contractual relationships, duties, and responsibilities of parties in Contract and those of Engineer shall not be altered from Contract Documents by mention or inference otherwise in reference documents.

1.5 TESTING AND INSPECTION SERVICES

- A. Employ and pay for services of an independent firm acceptable to Owner to perform specified testing and inspection.
 - 1. Prior to start of Work, submit testing laboratory name, address, and telephone number, and names of full-time registered Engineer, specialists and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of deficiencies reported by inspection.
- B. Independent firm will perform tests, inspections and other services specified in individual specification sections and as required by Engineer.
 - 1. Laboratory: Authorized to operate in State of Project location.
 - 2. Laboratory Staff: Maintain full time registered Engineer and necessary specialists on staff to review services.
 - 3. Testing Equipment: Calibrated at reasonable intervals with devices of accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.
- C. Testing and inspections may occur on or off project site. Perform off-site testing as required by Engineer or Owner.
- D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
 - 1. Notify Engineer and independent firm 24 hours prior to expected time for operations requiring services.
 - 2. Make arrangements with an independent firm and pay for additional samples and tests required for Contractor's use.

- E. Testing and employment of independent firm does not relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- F. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same independent firm on instructions by Engineer.
 - 1. Payment for re-testing or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.
 - 2. Submit final report indicating correction of Work previously reported as non-compliant.
- G. Independent Firm Responsibilities:
 - 1. Test samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with Engineer and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Engineer and Contractor of observed irregularities or non-conformance of Work or products.
 - 6. Perform additional tests required by Engineer.
 - 7. Attend preconstruction meetings and progress meetings.
- H. Independent Firm Reports: After each test, promptly submit one copy of report to Engineer and Owner; and two copies to Contractor, and authority having jurisdiction. When requested by Engineer, provide interpretation of test results. Include the following:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Name of inspector.
 - 4. Date and time of sampling or inspection.
 - 5. Identification of product and specifications section.
 - 6. Location in Project.
 - 7. Type of inspection or test.
 - 8. Date of test.
 - 9. Results of tests.
 - 10. Conformance with Contract Documents.
- I. Limits On Independent Firm:
 - 1. May not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. May not approve or accept any portion of the Work.
 - 3. May not assume duties of Contractor.
 - 4. Has no authority to stop the Work.

1.6 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to:
 - 1. Observe site conditions.
 - 2. Observe conditions of surfaces.
 - 3. Review installation and quality of Work.
 - 4. Review start-up of equipment.

5. Review testing, adjusting and balancing of equipment.
 6. Initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Verify utility services are available, of correct characteristics, and in correct locations.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

END OF SECTION

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SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary Utilities:
 - 1. Temporary electricity.
 - 2. Temporary water service.
 - 3. Temporary sanitary facilities.

- B. Construction Facilities:
 - 1. Project identification.
 - 2. Vehicular access.
 - 3. Parking.
 - 4. Progress cleaning and waste removal.
 - 5. Traffic regulation.

- C. Temporary Controls:
 - 1. Barriers.
 - 2. Security.
 - 3. Water control.
 - 4. Dust control.
 - 5. Erosion and sediment control.
 - 6. Noise control.
 - 7. Pest and rodent control.
 - 8. Pollution control.

- D. Removal of temporary utilities, facilities, and controls.

1.2 TEMPORARY ELECTRICITY

- A. Provide and pay for power service required from utility source as needed for construction operation.

- B. Provide temporary electric feeder from electrical service at location as directed by Owner. Do not disrupt Owner's use of service.

- C. Complement existing power service capacity and characteristics as required for construction operations.

- D. Provide power outlets, with branch wiring and distribution boxes located as required for construction operations. Provide flexible power cords as required for portable construction tools and equipment.

- E. Provide main service disconnect and over-current protection at convenient location or feeder switch at source distribution equipment.
- F. Permanent convenience receptacles may not be utilized during construction.

1.3 TEMPORARY WATER SERVICE

- A. Provide and pay for suitable quality water service as needed to maintain specified conditions for construction operations. Connect to existing water source if available and provide separate metering per utility company requirements.
- B. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

1.4 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Existing facility use is not permitted. Provide facilities at time of project mobilization.
- B. At end of construction, return existing facilities used for construction operations to same or better condition as original condition.

1.5 VEHICULAR ACCESS

- A. Construct temporary all-weather access roads from public thoroughfares to serve construction area, of width and load bearing capacity to accommodate unimpeded traffic for construction purposes.
- B. Construct temporary bridges and culverts to span low areas and allow unimpeded drainage.
- C. Extend and relocate vehicular access as Work progress requires, provide detours as necessary for unimpeded traffic flow.
- D. Location as indicated on Drawings or approved by Engineer.
- E. Provide unimpeded access for emergency vehicles. Maintain 20-foot wide driveways with turning space between and around combustible materials.
- F. Provide and maintain access to fire hydrants and control valves free of obstructions.
- G. Provide means of removing mud from vehicle wheels before entering streets.

1.6 PARKING

- A. When site space is not adequate, provide additional off-site parking.
- B. Use of designated existing on-site streets and driveways for construction traffic is not permitted. Tracked vehicles not allowed on paved areas.

- C. Use of designated areas of existing parking facilities by construction personnel is not permitted.
- D. Do not allow heavy vehicles or construction equipment in parking areas.
- E. Do not allow vehicle parking on existing pavement.
- F. Permanent Pavements And Parking Facilities:
 - 1. Prior to Substantial Completion, bases for permanent roads and parking areas may be used for construction traffic.
 - 2. Avoid traffic loading beyond paving design capacity. Tracked vehicles not allowed.
 - 3. Use of permanent parking structures is not permitted.
- G. Maintenance:
 - 1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
 - 2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.
- H. Removal, Repair:
 - 1. Remove temporary materials and construction at Substantial Completion.
 - 2. Remove underground work and compacted materials to depth of 2 feet; fill and grade site as specified.
 - 3. Repair existing or permanent facilities damaged by use, to original or specified condition.
- I. Mud from Site Vehicles: Provide means of removing mud from vehicle wheels before entering streets.

1.7 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing spaces.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and rubbish from site weekly and dispose off-site.
- E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.8 TRAFFIC REGULATION

- A. Signs, Signals, and Devices:
 - 1. Post Mounted and Wall Mounted Traffic Control and Informational Signs: As approved by authority having jurisdiction.

2. Automatic Traffic Control Signals: As approved by local jurisdictions.
 3. Traffic Cones and Drums, Flares and Lights: As approved by authority having jurisdiction.
 4. Flagperson Equipment: As required by authority having jurisdiction.
- B. Flag Persons: Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.
- C. Flares and Lights: Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.
- D. Haul Routes:
1. Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.
 2. Use haul routes and site access as indicated on Drawings.
 3. Confine construction traffic to designated haul routes.
 4. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.
- E. Traffic Signs And Signals:
1. Provide signs at approaches to site and on site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
 2. Provide, operate, and maintain automatic traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control, and areas affected by Contractor's operations.
 3. Relocate as Work progresses, to maintain effective traffic control.
- F. Removal:
1. Remove equipment and devices when no longer required.
 2. Repair damage caused by installation.
 3. Remove post settings to depth of 2 feet.

1.9 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by authorities having jurisdiction for public rights-of-way and for public access to existing building.
- C. Provide protection for plants designated to remain. Replace damaged plants.
- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.10 SECURITY

- A. Security Program:
 1. Protect Work and existing premises from theft, vandalism, and unauthorized entry.
 2. Initiate program at project mobilization.

3. Maintain program throughout construction period until Owner acceptance precludes need for Contractor security.

1.11 WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

1.12 DUST CONTROL

- A. Execute Work by methods to minimize raising dust from construction operations.
- B. Provide positive means to prevent air-borne dust from dispersing into atmosphere.

1.13 EROSION AND SEDIMENT CONTROL

- A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
- B. Minimize surface area of bare soil exposed at one time.
- C. Provide temporary measures including berms, dikes, and drains, and other devices as indicated to prevent water flow.
- D. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
- E. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

1.14 NOISE CONTROL

- A. Provide methods, means, and facilities to minimize noise produced by construction operations.

1.15 PEST AND RODENT CONTROL

- A. Provide methods, means, and facilities to prevent pests, insects, and rodents from damaging the Work.

1.16 POLLUTION CONTROL

- A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.
- B. Comply with pollution and environmental control requirements of authorities having jurisdiction.

1.17 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, and materials prior to Substantial Completion inspection.
- B. Remove underground installations to minimum depth of 2 feet. Grade site as indicated on Drawings.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

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SECTION 01 70 00
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes the following:
1. Closeout procedures.
 2. Final cleaning.
 3. Starting of systems.
 4. Demonstration and instructions.
 5. Protecting installed construction.
 6. Project record documents.
 7. Operation and maintenance data.
 8. Spare parts and maintenance products.
 9. Product warranties and product bonds.
 10. Maintenance service.

1.2 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's review.
- B. Provide submittals to Engineer required by authorities having jurisdiction.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.3 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
- B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- C. Clean equipment and fixtures to sanitary condition with cleaning materials appropriate to surface and material being cleaned.
- D. Replace filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.

- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.4 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

1.5 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed Shop Drawings, Product Data, and Samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish first floor datum.

2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
4. Field changes of dimension and detail.
5. Details not on original Contract drawings.

G. Submit documents to Engineer.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

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SECTION 31 23 17
TRENCHING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Excavating trenches for utilities and utility structures.
 2. Bedding.
 3. Backfilling and compacting to subgrade elevations.
 4. Sheeting and Shoring.
 5. Dewatering.
 6. Compacting backfill material.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials:
1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.
- B. ASTM International:
1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 2. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
 3. ASTM D1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
 4. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
 5. ASTM D2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 6. ASTM D6938 – Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
- C. SCDOT Standard Specifications:
1. Standard Specifications for Highway Construction, 2007, published by the South Carolina Department of Transportation.

1.3 DEFINITIONS

- A. Utility: Any buried pipe, duct, conduit, or cable.
- B. Utility Structures: Manholes, catch basins, inlets, valve vaults, hand holes, and other utility access structures as indicated on Drawings.
- C. Trench Terminology:
1. Foundation: Area under bottom of trench supporting bedding.
 2. Bedding: Fill placed under utility pipe.

3. Haunching: Fill placed from bedding to center line of pipe.
4. Initial Backfill: Fill place from center line to 6 to 12 inches above top of pipe.
5. Final Backfill: Fill placed from initial backfill to subgrade.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Excavation Protection Plan: Describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan. Prepare excavation protection plan under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of South Carolina.
- C. Dewatering Plan if required: Describe methods of dewatering and disposal of water.
- D. Product Data: Submit data for geotextile fabric indicating fabric and construction.
- E. Samples: Submit to testing laboratory, in air-tight containers, 10-pound sample of each type of fill.
- F. Materials Source: Submit name of imported fill material suppliers.
- G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with Division 200 of SCDOT Standard Specifications.
- B. Maintain one copy of document on site.

1.6 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.7 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.

PART 2 PRODUCTS

2.1 BACKFILL MATERIALS

- A. Subsoil Fill: Clean natural soil with a plasticity index of 15 or less that is free of clay, rock, or gravel lumps larger than 2 inches in any dimension; debris; waste; frozen material; and any other deleterious material that might cause settlement. Suitable material excavated from the site may be used as subsoil fill under optimum moisture conditions.

- B. Granular Fill: Clean sand, slightly silty sand, or slightly clayey sand having a Unified Soil Classification of SW, SP, SP-SM or SP-SC.
- C. Foundation Stone: Clean course aggregate Gradation No. 57 conforming to Section 801 of the SCDOT Standard Specifications.
- D. Bedding and Haunching Material:
 - 1. Rigid Pipe: Granular Fill.
 - 2. Flexible Pipe: Foundation Stone.
- E. Bedding for Structures: Foundation Stone.
- F. Initial Backfill to 6 inches Minimum Above Utility:
 - 1. Rigid Pipe: Subsoil Fill.
 - 2. Flexible Pipe: Foundation Stone.
- G. Final Backfill to Subgrade:
 - 1. Under Pavement: Granular Fill.
 - 2. Under Landscape: Subsoil Fill.

2.2 ACCESSORIES

- A. Geotextile Fabric: Non-woven, non-biodegradable conforming to Section 701 of the SCDOT Standard Specifications.
- B. Concrete: Class A Concrete conforming to Section 701 of the SCDOT Standard Specifications.
 - 1. Compressive strength of 3,000 psi at 28 days.
 - 2. Air entrained.
 - 3. Water cement ratio of 0.488 with rounded aggregate and 0.532 with angular aggregate.
 - 4. Maximum slump of 3.5 inches for vibrated concrete and 4 inches for non-vibrated concrete.
 - 5. Minimum cement content of 564 lbs per cubic yard for vibrated and 602 lbs. per cubic yard for non-vibrated concrete.

PART 3 EXECUTION

3.1 PREPARATION

- A. Call local utility line information service indicated on Drawings not less than three working days before performing Work.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum locations.
- C. Protect plant life, lawns, rock outcropping, and other features remaining as portion of final landscaping.
- D. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

- E. Maintain and protect above and below grade utilities indicated to remain.
- F. Establish temporary traffic control and detours when trenching is performed in public right-of-way. Relocate controls and reroute traffic as required during progress of Work.

3.2 LINES AND GRADES

- A. Excavate to lines and grades indicated on Drawings.
 - 1. Owner reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.
- B. Use laser-beam instrument with qualified operator to establish lines and grades.

3.3 TRENCHING

- A. Excavate subsoil required for utilities.
- B. Remove lumped subsoil, boulders, and rock up of 1/3 cubic yard, measured by volume.
- C. Perform excavation within 48 inches of existing utility service in accordance with utility's requirements.
- D. Do not advance open trench more than 200 feet ahead of installed pipe.
- E. Remove water or materials that interfere with Work.
- F. Trench Width: Excavate bottom of trenches maximum 16 inches wider than outside diameter of pipe or as indicated on Drawings.
- G. Excavate trenches to depth indicated on Drawings. Provide uniform and continuous bearing and support for bedding material and pipe.
- H. Maintain vertical faces to an elevation equal to 12 inches above top of pipe.
 - 1. When Project conditions permit, side walls may be sloped or benched above this elevation.
 - 2. When side walls cannot be sloped, provide sheeting and shoring to protect excavation as specified in this Section.
- I. Support Utilities and Structures:
 - 1. Keep trench width at top of trench to practical minimum to protect adjacent or crossing utility lines
 - 2. Support utilities crossing trench by means acceptable to utility company.
 - 3. Do not interfere with 45-degree bearing splay of foundations.
 - 4. Provide temporary support for structures above and below ground.
- J. When subsurface materials at bottom of trench are loose or soft, excavate to firm subgrade or to depth directed by Engineer.
 - 1. Cut out soft areas of subgrade not capable of compaction in place.
 - 2. Backfill with foundation stone and compact to density equal to or greater than requirements for subsequent backfill material.

- K. Trim Excavation: Hand trim for bell and spigot pipe joints where required. Remove loose matter.
- L. Correct areas over excavated areas with compacted backfill as specified for authorized excavation or replace with fill concrete as directed by Engineer.
- M. Place geotextile fabric over trench foundation stone prior to placing subsequent bedding materials.

3.4 SHEETING AND SHORING

- A. Sheet, shore, and brace excavations to prevent danger to persons, structures, and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil.
- B. Support trenches more than 5 feet deep excavated through unstable, loose, or soft material. Provide sheeting, shoring, bracing, or other protection to maintain stability of excavation.
- C. Design sheeting and shoring to be removed at completion of excavation work unless approved by Engineer.
- D. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.
- E. Repair damage to new and existing Work from settlement, water, or earth pressure or other causes resulting from inadequate sheeting, shoring, or bracing.

3.5 SURFACE WATER CONTROL

- A. Control and remove unanticipated water seepage into excavation.
- B. Provide ditches, berms, and other devices to divert and drain surface water from excavation area.
- C. Divert surface water and seepage water within excavation areas into sumps or settling basins prior to pumping water into drainage channels and storm drains.

3.6 DEWATERING

- A. Design and provide dewatering system to permit Work to be completed on dry and stable subgrade.
- B. Operate dewatering system continuously until backfill is minimum 2 feet above normal ground water table elevation.
- C. When dewatering system cannot control water within excavation, notify Engineer and stop excavation work.
 - 1. Supplement or modify dewatering system and provide other remedial measures to control water within excavation.
 - 2. Demonstrate dewatering system operation complies with performance requirements before resuming excavation operations.

- D. Modify dewatering systems when operation causes or threatens to cause damage to new construction, existing site improvements, adjacent property, or adjacent water wells.
- E. Discharge ground water and seepage water within excavation areas into sumps or settling basins prior to pumping water into drainage channels and storm drains.
- F. Remove dewatering and surface water control systems after dewatering operations are discontinued.

3.7 BEDDING, HAUNCHING, AND INITIAL BACKFILL

- A. Place bedding full width of trench to the depth indicated on Drawings and compact to 95 percent maximum density. Excavate for pipe bells.
- B. Install utility pipe and conduit in accordance with the respective utility section.
- C. Support pipe uniformly along entire length of pipe.
- D. Carefully place haunching material to depth indicated on Drawings, rod and tamp material to fill voids and provide uniform support of pipe haunches. Compact to 95 percent maximum density.
- E. Carefully place initial backfill to 6 inches above top of pipe or to depth indicated on Drawings. Compact to 95 percent maximum density.

3.8 FINAL BACKFILLING TO SUBGRADE

- A. Backfill trenches to contours and elevations with unfrozen fill materials.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- C. Place fill material in continuous layers and compact in accordance with schedule at end of this Section.
- D. Employ placement method that does not disturb or damage utilities in trench or foundation perimeter drainage.
- E. Maintain optimum moisture content of fill materials to attain required compaction density.
- F. Do not leave more than 50 feet of trench open at end of working day.
- G. Protect open trench to prevent danger to the public.

3.9 DISPOSAL OF EXCESS MATERIAL

- A. Dispose of excess material offsite and legally.
- B. Furnish Engineer with certificate of disposal site or agreement from private property owner.

3.10 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Top Surface of Backfilling: Plus or minus 1 inch from required elevations.

3.11 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Perform laboratory material tests in accordance with ASTM D1557 or AASHTO T180.
- C. Perform in place compaction tests in accordance with the following:
 - 1. Density Tests: ASTM D1556, ASTM D2167, or ASTM D6938.
 - 2. Moisture Tests: ASTM D6938.
- D. When tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.
- E. Frequency of Tests: Two tests per lift for every 1,000 feet of trench.

3.12 PROTECTION OF FINISHED WORK

- A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished work.
- B. Reshape and re-compact fills subjected to vehicular traffic during construction.

3.13 SCHEDULE OF COMPACTION

- A. Under Pavement and Slabs:
 - 1. Granular Fill in maximum 8-inch loose lifts.
 - 2. Compact to minimum 95 percent maximum density except the top 12 inches.
 - 3. Compact top 12 inches to minimum 98 percent maximum density.
- B. Under Landscape Areas:
 - 1. Subsoil Fill in maximum 8-inch loose lifts.
 - 2. Compact to minimum 90 percent maximum density.
- C. In Unstable or Unsuitable Trench Foundation Areas:
 - 1. Foundation Stone in maximum 12-inch loose lifts.
 - 2. Compact to 98 percent maximum density.

END OF SECTION

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SECTION 32 11 23
AGGREGATE BASE COURSES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aggregate base course on a prepared subgrade.
- B. Related Sections:
 - 1. Section 32 12 16 - Asphalt Paving: Binder and finish asphalt courses.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-pound) rammer and a 457-mm (18-inch) drop.
- B. ASTM International:
 - 1. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 2. ASTM D1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
 - 3. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
 - 4. ASTM D6938 – Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
- C. SCDOT Standard Specifications:
 - 1. Standard Specifications for Highway Construction, 2007, published by the South Carolina Department of Transportation.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Samples: Submit to testing laboratory 10-pound sample of each type of aggregate in airtight containers.
- C. Materials Source: Submit name of imported materials suppliers.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with Division 300 of SCDOT Standard Specifications.

- B. Maintain one copy of document on site.
- C. Furnish each aggregate material from single source throughout the Work.
- D. Use sources participating in SCDOT Qualified Product List for each aggregate required.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Aggregate Base Course: Graded aggregate base course (ABC) conforming to Section 305 of SCDOT Standard Specifications.
- B. Fine Aggregate: Fine aggregates with gradations conforming to Division 300 of SCDOT Standard Specifications.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verify existing conditions before starting work.
- B. Verify substrate has been inspected and gradients and elevations are correct and dry.

3.2 PREPARATION

- A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting as specified in Section 31 23 17 –Trenching.
- B. Do not place fill on soft, muddy, or frozen surfaces.
- C. Proof roll areas to receive fill, pavement, and building slabs.

3.3 AGGREGATE PLACEMENT

- A. Place aggregate in minimum 4-inch and maximum 10-inch layers and roller compact to specified density. When total thickness is 10 inches or less, place in one layer. When total thickness is greater than 10 inches, place in two equal layers.
- B. Have each layer of material compacted and approved prior to placing succeeding layers.
- C. Level and contour surfaces to elevations and gradients indicated on Drawings.
- D. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.
- E. Maintain optimum moisture content of fill materials to attain required compaction density.

F. Use mechanical tamping equipment in areas inaccessible to roller compaction equipment.

3.4 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation from Thickness: 1/2 inch.

C. Maximum Variation from Elevation: 1/2 inch.

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Independent laboratory, field inspecting, testing, adjusting, and balancing.

B. Laboratory Material Tests: Conform to Modified Proctor ASTM D1557 or AASHTO T180.

C. In-place Compaction Tests: Conform to:

1. Density Tests: ASTM D1556, ASTM D2167, or ASTM D6938.
2. Moisture Tests: ASTM D6938.

D. Compaction:

1. 100 percent of maximum when measured in-place by standard methods.
2. 98 percent of maximum when measured in-place by nuclear methods.

E. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

F. Frequency of Compaction Tests: Two tests per layer for every 5,000 tons of aggregate base course.

END OF SECTION

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SECTION 32 12 16
ASPHALT PAVING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Asphaltic Concrete Paving: Surface, binder, and base courses.
 - 2. Prime Coat and Tack Coat.
 - 3. Surface Sealer.
 - 4. Quality Control and Testing.

- B. Related Sections:
 - 1. Section 32 11 23 - Aggregate Base Courses: Compacted base for paving.

1.2 REFERENCES

- A. SCDOT Standard Specifications:
 - 1. Standard Specifications for Highway Construction, 2007, published by the South Carolina Department of Transportation.

- B. SCDOT Construction Manual:
 - 1. Construction Manual, May 2004, published by the South Carolina Department of Transportation.

- C. SCDOT Supplemental Specifications:
 - 1. Supplemental Specification for Emulsified Coal-Tar Pitch Pavement Sealer For Bituminous Pavements, July 13, 1989, published by the South Carolina Department of Transportation.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

- B. Product Data: Submit product information and mix design.

- C. Manufacturer's Certification: Certify products are produced at a plant approved by SCDOT and that products meet or exceed specified requirements.

- D. Installer Certification: Certify installer is on list of SCDOT approved contractors with an approved Quality Control Plan.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with Division 400 of SCDOT Standard Specifications.

- B. Maintain on site one copy of each document.

- C. Obtain materials from same source throughout.
- D. Installer Qualification: Company specializing in performing work of this Section with minimum 5 years experience.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not place asphalt base course or intermediate course when ambient air or road surface temperature is less than 35 degrees F. or surface is wet or frozen.
- B. Do not place asphalt surface course when ambient air or road surface temperature is less than 50 degrees F. or wet.
- C. Place bitumen mixture when temperature is not more than 15 degrees F. below temperature at when initially mixed and not more than maximum specified temperature.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Asphalt Plant Mix Materials: Conform to Division 400 of SCDOT Standard Specifications.
- B. Prime Coat and Tack Coat: Conform to Division 400 of SCDOT Standard Specifications.
- C. Reclaimed Asphalt Pavement (RAP): Processed material obtained by milling or full depth removal of existing asphalt concrete pavements. Conform to Division 400 of SCDOT Standard Specifications.
- D. Sand: Fine aggregate, gradation conforming to Division 300 of SCDOT Standard Specifications.

2.2 ASPHALT PAVING MIX

- A. General:
 - 1. SCDOT R/W – Use HMA Type B mix design conforming to Section 403 of SCDOT Standard Specifications.
- B. Base Course: Graded Aggregate Base Course (GABC)
- C. Intermediate Course: Type B. (for SCDOT R/w Section only)
- D. Surface Course: Type B or C Hot Laid Asphalt Concrete Surface Course. (see schedule)
- E. Wedging or Leveling Mix: HMA Type C.

- F. Sealer: Use Emulsified Coal-Tar Pitch Pavement Sealer conforming to Supplemental Specification July 13, 1989 of SCDOT Standard Specifications.

2.3 SOURCE QUALITY CONTROL AND TESTS

- A. Section 00 14 00 - Quality Requirements: Testing, inspection, and analysis requirements.
- B. Submit proposed mix design of each class of mix for review prior to beginning Work.
- C. Obtain materials from plant approved by SCDOT.
- D. Test plant samples in accordance with Section 401 of SCDOT Standard Specifications.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify compacted subgrade and aggregate base is dry and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.
- C. Verify utility structure frames and lids are installed in correct position and elevation.

3.2 PRIME COAT

- A. Apply primer on aggregate base course at uniform rate of 0.25 to 0.28 gal/sq. yd. in accordance with Section 406 of SCDOT Standard Specifications.
- B. Apply primer to contact surfaces of curbs and gutters.
- C. Use clean sand to blot excess primer.

3.3 TACK COAT

- A. Apply tack coat on asphalt or concrete surfaces at uniform rate of 0.05 to 0.15 gallons/square yard in accordance with Section 401 of SCDOT Standard Specifications.
- B. Apply tack coat to contact surfaces of curbs and gutters.
- C. Coat surfaces of utility structures with oil to prevent bond with asphalt pavement. Do not tack-coat these surfaces.

3.4 PLACING ASPHALT PAVEMENT

- A. Install Work in accordance with Section 401 of SCDOT Standard Specifications.
- B. Place asphalt within 24 hours of applying prime coat or tack coat.

- C. Place asphalt in courses to the thicknesses and dimensions shown on the Drawings.
- D. Place binder and intermediate courses.
- E. Place surface course within 2 hours of placing and compacting binder course. When binder course is placed more than 24 hours before placing wearing course, clean surface and apply tack coat before placing wearing course.
- F. Place surface course to thicknesses and dimensions shown on the Drawings.
- G. Compact each course by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
- H. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.5 JOINTS

- A. Traverse Joints:
 1. When Work is suspended long enough to allow mixture to chill, construct transverse joint.
 2. Use butt joint when traffic will not pass over pavement.
 3. Use sloped wedge ahead of the end of pavement when traffic will pass over pavement. Place paper parting strip to removal of wedge.
 4. Tack coat edge of pavement prior to placing adjoining pavement.
- B. Longitudinal Joints:
 1. Tack the edge of longitudinal joints prior to placing adjoining pavement.
 2. Pinch joint by rolling immediately behind the paver.
 3. Offset longitudinal joints in each layer by approximately 6 inches.

3.6 SEALER

- A. Emulsified Coal-Tar Pitch Pavement Sealer in accordance with SCDOT Supplemental Specification, "Emulsified Coal-Tar Pitch Pavement Sealer For Bituminous Pavements", Dated July 13, 1989. http://www.scdot.org/doing/pdfs/Sup_Specs/89-07-13.pdf

3.7 TOLERANCES

- A. Density Compaction: Minimum of 92 percent of Maximum Specific Gravity (G_{mm}).
- B. Flatness: Maximum variation of 1/8-inch measured with 10-foot straight edge.
- C. Compacted Thickness: Within 1/4-inch.
- D. Variation from Indicated Elevation: Within 1/2-inch.

3.8 FIELD QUALITY CONTROL

- A. Section 00 14 00 - Quality Requirements: Independent testing firm, field testing, and inspecting.
- B. Perform Contractor Quality Control Program in accordance with Appendix C of the SCDOT Construction Manual, May 2004, published by the South Carolina Department of Transportation.
- C. Take compaction tests every 1,000 square feet or fraction thereof per day on pavement placed at the paver lay down width.
- D. Take 6-inch diameter full depth pavement cores every 1,000 square feet or fraction thereof per day on pavement placed at the paver lay down width.
- E. When tests indicate Work does not meet specified requirements, remove Work, replace, and retest.

3.9 PROTECTION OF FINISHED WORK

- A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished work.
- B. Immediately after placement, protect pavement from mechanical injury for seven days or until surface temperature is less than 140 degrees F.

3.10 Schedules

- A. See Pavement Section Details on Sheet C501.

END OF SECTION

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SECTION 33 01 30.63
SUBSURFACE MANHOLE REHABILITATION

PART 1 GENERAL

1.1 SUMMARY

- A. The scope of this section of the Specifications includes requirements for furnishing all labor, material and equipment to provide for the reconstruction of existing manholes, using an approved method of non-disruptive rehabilitation within an existing structure, which has generally maintained its original shape.
- B. The work performed under this Section of the Specifications is deemed to be Specialty Subcontractor Work.
- C. Related Requirements:
 - 1. Section 33 01 32 – Sewer and Manhole Testing
 - 2. Section 33 05 13 – Utility Manholes and Structures

1.2 REFERENCE STANDARDS

- A. ASTM International:
 - 1. ASTM C109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm) Cube Specimens
 - 2. ASTM C1244 - Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill.
 - 3. ASTM D638 - Standard Test Method for Tensile Properties of Plastics
 - 4. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics
 - 5. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. The Contractor shall submit product data for all products to be installed under this section of the Specifications.
- C. The Contractor shall submit evidence of meeting the requirements of Article 1.02 above.
- D. The Contractor shall provide bond strength data on the cured cementitious lining based on ASTM test methods referenced in this Specification
- E. The Contractor shall provide test data on shrinkage of the cured cementitious lining based on applicable ASTM test methods.
- F. The Contractor shall submit complete shop drawings of the manhole lining system(s) to demonstrate compliance with these Specifications, materials and detailed installation procedures.

Testing procedures and quality control procedures shall also be submitted. Certifications that the lining system was manufactured in accordance with these Specifications and the applicable ASTM standards shall be submitted with each material shipment.

G. Qualifications Statements:

1. Submit qualifications for manufacturer and applicator.
2. Submit manufacturer's approval of applicator.

1.4 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for closeout procedures.

1.5 QUALIFICATIONS

- A. The Specialty Subcontractor performing the work shall be fully qualified, experienced and equipped to complete this work expeditiously and in a satisfactory manner. The Specialty Subcontractor shall be an approved installer as certified and licensed by the manufacturer. The Contractor must certify that the proposed product/process to be used is the exact system for which any and all submittals and certifications were made. No substitutions will be allowed, and misrepresentations or omissions may be grounds for Contract termination with the Contractor waiving any and all claims against the Owner for work performed or costs incurred.
- B. The proposed Qualifying superintendent of the Specialty Subcontractor for the work under this Section shall have successfully installed a cementitious manhole lining product in a minimum of 500 manholes/structures as documented by verifiable Owner references. The Owner must approve both the Specialty Subcontractor and the Qualifying Superintendent to perform this work. The approved superintendent shall be on-site during the execution of all lining operations including prep work and vacuum testing. The lining installation and/or vacuum testing shall cease whenever the superintendent is not on-site.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- B. Protect materials from damage by storing in secure location.

1.7 WARRANTY

- A. The COATINGS MANUFACTURER shall warranty the entire project to include any and all aspects of the surface preparation, base material installation and protective coating applications for a period of TEN (10) YEARS from the date of acceptance by the OWNER. The warranty shall make no distinction between installation practices and material performance and shall not be prorated with respect to elapsed time for the entire warranty period. Manufacturer shall, within 60 days after receipt of written notice thereof by the Owner, repair defects in materials or workmanship during said TEN (10) year period, and any damage to other work caused by such defects or repairing of same at his own expense and without cost to the Owner.

PART 2 PRODUCTS

2.1 CEMENTITIOUS LINING

- A. Where cementitious lining is required in the manhole prior to the Level C lining system due to hydrogen sulfide attack, cracks, holes or other structural defects allowing infiltration, a cementitious lining shall be applied to achieve a smooth surface to receive the Level C lining and shall be one of the following products:
1. MS-2C or High performance Mix as manufactured by Strong Seal Systems
 2. Alumaliner as manufactured by Quadex
 3. Permacast MS-10,000 or CR-5000 with Conshield by as manufactured by APM, Inc.
 4. Sewpercoat PG as manufactured by LaFarge Calcium Aluminates
 5. Mainstay ML-CA as manufactured by Madewell Products Corp.
 6. SewerSeal No. F-170 as manufactured by Sauereisen
 7. CSM as manufactured by AW Cook
 8. Reliner MSP® by Standard Cement Materials, Inc.
- B. The cementitious lining system shall be pumpable Portland-based cement or fused calcium aluminate cement. The lining shall be applied via low-pressure spray or trowel application only. The materials shall be suitable for all specified design conditions. The final product shall not deteriorate, corrode, or lose structural strength in any manner.
- C. The cementitious lining shall be installed on manhole benches, invert and walls unless otherwise directed by the Engineer.
- D. The materials used in the cementitious lining systems shall be mixed on-site according to the manufacturer's recommendations. Water shall be added to the materials only during the mixing process and prior to material pumping or spray application. No water shall be added at the nozzle.
- E. The cementitious liner, when cured, shall have the following minimum characteristics at 28 days as measured by the applicable ASTM standards referenced in this Specification:
1. Minimum compressive strength of 6,000 psi.
 2. Minimum bond strength of 130 psi.
 3. Shrinkage of less than 0.05%
- F. The cured cementitious lining shall be continuously bonded to all brick, mortar, concrete, chemical sealant, grout, pipe and other substrates inside the manhole.
- G. Chemical sealants or grouts used to seal active manhole leaks, patch holes or cracks, fill voids and to otherwise prepare the manhole surface for lining shall be suitable for wastewater system service and chemically resistant to any chemicals or vapors normally associated with domestic wastewater installations.
- H. Cementitious linings shall be compatible with existing thermal conditions in the manhole.

2.2 POLYMER RESIN-BASED LININGS

- A. Polymer resin-based liners shall be 100% solids by volume, volatile organic compound (VOC) free and shall conform to the minimum physical properties listed in the following table:

Compressive Strength	ASTM D695	10,500 psi
Tensile Strength	ASTM D638	7,000 psi
Flexural Strength	ASTM D790	12,000 psi
Flexural Modulus (Initial)	ASTM D790	730,000 psi
Density		87 + pcf
Bond		Exceed tensile strength of substrate

- B. The structures lined with epoxy resin-based liners shall be resistant to corrosion caused by:
1. Hydrogen Sulfide
 2. 20% Sulfuric Acid
 3. 17% Nitric Acid
 4. 5% Sodium Hydroxide
 5. All common ingredients normally associated with sanitary sewer environments
- C. The finished liner shall have long-term (50-year) flexural modulus of elasticity value of 500,000 psi and shall be certified by independent third-party testing.
- D. Epoxy Polymer resin-based linings shall be compatible with existing thermal conditions in the manhole. .
- E. The final product shall not deteriorate, corrode, or lose structural strength in any manner.
- F. The system shall be designed to operate at ambient temperatures up to 140 degrees F with excellent abrasion resistance.
- G. Level C Lining System: The Level C lining system shall be an polymer resin-based lining system applied with a minimum 250 mil (1/4-inch) finished thickness and shall be one of the following products:
1. Spraywall or Sprayshield as manufactured by Sprayroq, Inc.
 2. S-301 Epoxy Spray System as manufactured by Warren Environmental, Inc.
 3. Dinjer SG Mastic as manufactured by Pilgrim Permocoat Inc.
 4. SpectraShield Liner Systems as installed by Spectra Tech
 5. Raven 405 as manufactured by Raven Lining Systems
 6. ShureFlex as manufactured by Sherwin-Williams
 7. DS-5 Mainstay Lining System as manufactured by Madewell Products Corp.
 8. SLS™ as manufactured by Protective Liner Systems.
 9. Structure Guard as manufactured by Quadex.

PART 3 EXECUTION

3.1 General

- A. The Contractor shall notify all property owners who discharge sewage directly into the manhole being rehabilitated at least 48 hours in advance, giving the date, starting and estimated completion time for the work being conducted and any anticipated impact to the property owner.
- B. The Contractor shall bypass pump sewage flows around the manhole being rehabilitated while the work is being performed. A detailed bypass plan shall be submitted to the Engineer for approval before any work shall take place.
- C. Covers or plugs shall be placed over all pipe openings to prevent excess material from entering the wastewater collection system.
- D. Manhole walls and benches shall be monolithically coated to the required thickness by spray-on methods in a single pass or application. Sprayed cementitious linings shall be trowelled smooth after application.
- E. All invert channels shall be coated with grout or cementitious mortar to build up the invert to the invert elevations of new liner pipes (if applicable and as directed by the Engineer); to fill all cracks, voids, holes, etc.; and to form a smooth flow channel. The entire channel shall be coated with the channel coating being a minimum ¼-inch thick.
- F. A complete watertight seal shall be provided at the pipe and manhole wall connections. The Contractor shall submit details of how watertight connections shall be made to the Engineer for approval prior to performing any work.
- G. Manhole lining shall not be installed until all required mainline sewer rehabilitation and/or other manhole work is completed.
- H. Application of the spray applied material must be completed in one mobilization in order to minimize the disruption and cost of bypass pumping, pipeline plugging, traffic control and other ancillary services.
- I. The finished manhole may be returned to service immediately upon completion of the spray application.
- J. Appropriate personal protection equipment shall be used with supplied air being utilized to the spray technician and other personnel in direct contact with the spray environment.
- K. The spray shall be applied so that the entire structure receives a structurally sound, monolithic liner. The finished invert surfaces shall be smooth, free of ridges and bumps and will be sloped in the direction of flow. Special care shall be taken to ensure a smooth transition between the new manhole invert and intersecting pipeline inverts so that flow will not be impaired.
- L. The cured surfacing thickness shall be smooth, even (without ridges or bumps) and continuous with proper sealing connections to any non-rehabilitated areas.

- M. The monolithic lining shall completely cover the interior of the existing manhole including the benches and invert unless otherwise directed by the Engineer. The lining shall effectively seal the interior surfaces of the manhole and prevent any penetration or leakage of ground water infiltration.

3.2 SURFACE PREPARATION

- A. The Contractor shall clean each sewer manhole to be restored and shall dispose of any debris or resulting material in a manner and place suitable to the Owner. Cleaning shall be performed using a high-pressure jet wash at a minimum of 3,500 psi water pressure to remove all dust, biological growths, grease, oils or any other surface contaminants or coatings.
- B. The Contractor shall immediately notify the Engineer of any coatings that cannot be removed or substrates which cannot be cleaned and, upon the approval of the Engineer, may use a blast abrasive in these area(s) to rough up the surface sufficient to obtain and ensure adequate bonding of the liner. Roots shall be removed by manually cutting them from inside the manhole.
- C. The Contractor shall conduct a visual inspection of each manhole after it is cleaned. All active leaks shall be plugged or sealed with an appropriate grout or cementitious lining compatible with the epoxy resin-based lining. Injection grouting may be required to seal active leaks including existing leaks in invert channels and benches. All loose mortar and rubble of existing benches, walls and inverts shall be removed.
- D. The Contractor shall prepare the manhole to receive lining as necessary by reshaping and repairing benches, inverts and walls where required including smoothing out irregular shaped corbel and chimney sections prior to any spray application. All interior surfaces shall be prepared as recommended by the lining system manufacturer. Minimum requirements of the Specification are as follows:
 - 1. All cracks and voids must be repaired and filled with suitable non-shrinking cements, sealants or grouts, including all voids between existing sewer pipes and manhole walls. All patch repairs shall be smooth and even with the manhole wall.
 - 2. All voids around existing manhole rungs, steps and anchors shall be filled.
 - 3. All surfaces shall be suitably prepared for the required bonding of the liner as recommended by the manufacturer and acceptable to the Engineer.
- E. Prior to lining, the Engineer shall inspect and approve the surface preparation work. The Contractor shall notify the Engineer when the manholes are ready for inspection. The manhole lining shall be performed immediately after the Engineer's inspection or the manhole may need to be re-cleaned prior to lining application to remove accumulated debris on walls and benches.

3.3 Requirements for Resin-Based Manhole Lining (Level C)

- A. Application of the liner shall not be made unless the ambient temperature inside the structure is 50 degrees F or higher and expected to be the same or rise during the next 72 hours.
- B. The liner shall be manually sprayed to all surfaces by a factory-certified, trained technician experienced in the application of a spray applied resin.

- C. No other products such as grouts, cements or sealants may be considered as part of the structural restoration. However, said products may be used as part of the repair and surface preparation process as specified in Section 3.02 of this Specification.
- D. The wall of the level “C” liner shall be structurally designed to withstand the hydraulic load generated by the groundwater table and to restore structural integrity.

3.4 Acceptance Testing

A. Field Acceptance

- 1. Field acceptance of manhole lining shall be based on the Engineer’s field inspection and evaluation of the appropriate installation and curing test data. The lining shall provide a continuous monolithic surfacing with uniform thickness throughout the manhole interior. If the thickness is not uniform or is less than specified, it shall be repaired or replaced at no additional cost to the Owner.
- 2. If the Engineer has to enter the manhole to inspect the work, the Contractor shall provide forced air ventilation, gas monitors, harnesses, lights, confined space entry, etc. for the Engineer to enter the manhole and perform the inspection in strict and complete accordance with OSHA requirements at no additional cost to the Owner.

B. Cementitious Test Samples

- 1. Samples shall be taken of the installed liner each day that the cementitious lining is installed in the following manner:

Quantity of Manholes Lined in One Day	Quantity of Samples Required
1 – 5	1
6 – 10	2
11 – 15	3
16 or more	4

- 2. Samples shall be taken at equally spaced intervals throughout the workday. The frequency of tests may be increased by the Engineer and performed by the Contractor at no additional cost to the Owner when the required tests indicate that the installed lining does not meet the Specification.

C. Cementitious Lining Strength and Bonding Testing Procedures: Samples shall be cube samples. A minimum of six cubes shall be taken for each sample testing. The samples shall be tested in accordance with the applicable ASTM standards, including ASTM C109, to verify that the installed liner meets the compressive strength requirements specified herein and the lining manufacturer’s published product data. Tests shall include 7-day and 28-day strength tests (3 cubes for each time period per sample). Shrinkage and bond strength tests shall be performed on each batch or lot of material shipped to the Contractor. Testing shall be performed by an independent laboratory with all associated costs paid by the Contractor. The test results shall be submitted to the Engineer immediately when available and no later than 30 days after lining installation.

D. Vacuum Testing (Cementitious Mortars)

- 1. All manholes shall be vacuum tested when all manhole rehabilitation is completed. Manholes shall not be tested until at least 7 days after installation of lining.

2. Vacuum testing shall be performed in accordance with ASTM C1244 with all associated costs paid for by the Contractor and included in the bid price for manhole lining.
 3. The Engineer shall be present for all testing. The Contractor shall notify the Engineer 48 hours prior to testing.
 4. The Contractor shall submit test reports of the testing which include: the project name, manhole tested, testing data (vacuum pressure, duration of test, etc.) and whether the manhole passed or failed the test. Test reports must be submitted citing the reason for failure noted on the report.
 5. Any manhole failing the test shall be repaired and retested immediately by the Contractor at no additional cost to the Owner.
- E. Spark Arrestor (Holiday) Testing, Level C Polymer Resin-Based Manholes Only
1. All epoxy resin-based manhole linings shall be spark tested prior to being placed in service. Spark testing shall be required of the entire surface area of the manhole (field and joint) and shall be conducted in accordance with the liner system manufacturer's recommendations.
 2. Results of the spark tests will be logged in duplicate and a copy of this log submitted to the Engineer.
 3. Equipment systems used to perform spark testing shall be compatible with the materials to be tested. Spark testing equipment shall provide a visual as well as audible indicator to identify pinholes or splits in the liner system.
- F. Finished Lining Systems
1. There shall be no groundwater infiltration or other leakage (active or previously active) through the manhole walls, benches, inverts or pipe connections at the manhole after it has been lined.
 2. If leakage is detected, it shall be eliminated with an appropriate, grout or sealant as recommended by the manufacturer, over coated with epoxy or approved level C lining material and approved by the Engineer at no additional cost to the Owner. Injection grouting may be required to stop leaks around or in invert channels, pipe connections and benches.
 3. The Engineer's decision regarding acceptable repair methods for defective linings shall be final. If any lining is found to be defective after it has been installed or during the warranty period, it shall be repaired or replaced in a manner satisfactory to the Engineer and at no additional cost to the Owner.

END OF SECTION

SECTION 33 01 32
SEWER AND MANHOLE TESTING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Gravity Sewer Testing:
 - a. Low-pressure Air Test.
 - b. Exfiltration Test
 - c. Infiltration Test.
 - 2. Deflection Testing of Plastic Piping.
 - 3. Camera Inspection (CCTV)
 - 4. Manhole Testing:
 - a. Vacuum Test.
 - b. Exfiltration Test.

- B. Related Sections:
 - 1. Section 33 05 13.16 – Utility Manholes and Structures.
 - 2. Section 33 31 00 – Sanitary Utility Sewerage Piping.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM C828 - Standard Test Method for Low-Pressure Air Test of Vitrified Clay Pipe Lines.
 - 2. ASTM C924 - Standard Practice for Testing Concrete Pipe Sewer Lines by Low-pressure Air Test Method.
 - 3. ASTM C1244 - Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test.
 - 4. ASTM D2122 - Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

- B. Submit the following prior to start of testing:
 - 1. Testing procedures.
 - 2. List of test equipment.
 - 3. Testing sequence schedule.
 - 4. Provisions for disposal of flushing and test water.
 - 5. Certification of test gauge calibration.
 - 6. Deflection mandrel drawings and calculations.

- C. Test Reports: Indicate results of manhole and piping tests.

PART 2 PRODUCTS - NOT USED

EXECUTION

2.1 EXAMINATION

- A. Verify that manholes and piping are ready for testing.
- B. Verify trenches are backfilled.
- C. Verify pressure piping concrete reaction support blocking or mechanical restraint system is installed.

2.2 PIPING PREPARATION

- A. Flush and clean piping.
- B. Assist Engineer in lamping gravity piping.
 - 1. Engineer will perform lamping operation by shining light at one end of each pipe section between manholes; observe light at other end; reject pipe not installed with uniform line and grade
 - 2. Remove and reinstall rejected pipe sections; re-clean and assist engineer with re-lamping.
- C. Plug outlets, wye-branches, and laterals; brace plugs to resist test pressures.

2.3 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Notify Engineer and Dorchester County Water & Sewer Department 72 hours in advance of tests and have witness tests.

2.4 TESTING GRAVITY SEWER PIPING

(The Department will require that all sanitary sewer systems pass the following test prior to acceptance. The Department shall be notified 72 hours before inspections)

- A. Low-pressure Air Test:
 - 1. Perform test in accordance with applicable portions of ASTM 828 and ASTM 924.
 - 2. Test each section of gravity sewer piping between manholes.
 - 3. Introduce air pressure slowly to approximately 4 psig.
 - 4. Determine groundwater elevation above spring line of pipe. For every foot of groundwater above spring line of pipe, increase starting air test pressure by 0.43 psig; do not increase pressure above 9 psig.
 - 5. Allow pressure to stabilize for at least five minutes. Adjust pressure to 4 psig or increased test pressure as determined above when groundwater is present. The air

pressure shall be throttled to maintain that internal pressure for at least 2 minutes.
Start test.

6. Determine test duration for sewer section with single pipe size from Table I found in the Dorchester County Water & Sewer standards.
7. Record drop in pressure during test period; when air pressure has dropped more than 1.0 psig during test period, piping has failed; when 1.0 psig air pressure drop has not occurred during test period, discontinue test and piping is accepted.
8. When piping fails, determine source of air leakage, make corrections and retest; test section in incremental stages until leaks are isolated; after leaks are repaired, retest entire section between manholes.

1	2	3	4	Specification Time for Length (L) Shown (min:sec)							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
Pipe Diameter (in)	Minimum Time (min:sec)	Length for Minimum Time (ft)	Time for Longer Length (sec)								
4	4:00	597	0.380L	4:00	4:00	4:00	4:00	4:00	4:00	4:00	4:00
6	5:40	398	0.854L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:26
8	7:34	298	1.520L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:25
10	9:26	239	2.374L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3.418L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	144	10.470L	19:50	26:10	34:54	43:37	52:21	61:00	59:48	78:31
24	22:40	99	13.674L	22:47	34:11	45:34	56:58	68:32	79:46	91:10	102:33
27	25:30:00	88	17.306L	28:51	43:16	5:41	72:07	86:32	100:57	115:22	129:48
30	28:20:00	80	21.366L	35:37	53:25	1:13	89:02	106:50	124:38	142:26	160;15
33	31:10:00	72	25.852L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53
36	34:00:00	66	30.768L	51:17	76:55	102:34	128:12	153:50	178:29	205:07	230:46

B. Camera Inspection: Contractor to follow the CCTV procedures / requirements found in Dorchester County's "Minimum Standards for the Design and Construction of Water and Sanitary Sewer Systems".

C. Leaking and Infiltration Test:

1. At the discretion of the Department, Leaking / Infiltration Testing may be required.
2. All pipe joints shall be watertight. Infiltration of groundwater or other leakage into the sewer (including manholes) shall not exceed 50 gallons per mile of sewer per inch of inside diameter of the sewer per 24 hours in any section of completed work, and in no case shall it exceed 3,000 gallons per mile per 24 hours. The infiltration rate into each section of the sewer shall be measured by the temporary installation of

suitable metal or wooden weirs as authorized by the Department. These weirs shall be furnished, installed, and removed by the Contractor. Any leaks into the sewer shall be located, repaired, and corrected.

- D. Soil Compaction Test
 - 1. At the discretion of the Department, Additional Soil Compaction Test may be required.
 - 2. All trenches suspected of not meeting the compaction requirements stated previously shall be tested for conformance by a Department approved testing lab and at the locations and depths requested by the Department.

2.5 DEFLECTION TESTING OF PLASTIC PIPING

- A. Perform vertical ring deflection testing on PVC and ABS sewer piping after backfilling has been in place for at least 30 days but not longer than 12 months.
- B. Allowable maximum deflection for installed plastic sewer pipe is limited to 5 percent of original vertical internal diameter.
- C. Furnish rigid ball or mandrel with diameter not less than 95 percent of base or average inside diameter of pipe as determined by ASTM standard to which pipe is manufactured. Measure pipe in compliance with ASTM D2122.
- D. Perform deflection testing using properly sized rigid ball or 'Go, No-Go' mandrel.
- E. Perform test without mechanical pulling devices.
- F. Locate, excavate, replace, and retest pipe exceeding allowable deflection.

2.6 TESTING MANHOLES

- A. General: Test using air whenever possible prior to backfilling to assist in locating leaks. Make joint repairs on both outside and inside of joint to ensure permanent seal. Test manholes with manhole frame set in place.
- B. Vacuum test in accordance with ASTM C1244 and as follows:
 - 1. Plug pipe openings; securely brace plugs and pipe.
 - 2. Inflate compression band to affect seal between vacuum base and structure; connect vacuum pump to outlet port with valve open; draw vacuum to 10 inches of Hg; close valve; start test.
 - 3. Determine test duration for manhole from the following table:

Manhole Diameter	Test Period
4 feet	60 seconds
5 feet	75 seconds
6 feet	90 seconds

4. Record vacuum drop during test period; when vacuum drop is greater than 1 inch of Hg during test period, repair and retest manhole; when vacuum drop of 1 inch of Hg does not occur during test period, discontinue test and accept manhole.
5. When vacuum test fails to meet 1 inch Hg drop in specified time after repair, repair and retest manhole.

C. Exfiltration Test:

1. Plug pipes in manhole; remove water in manhole; observe plugs over period of not less than 2 hours to ensure there is no leakage into manhole.
2. Determine groundwater level outside manhole.
3. Fill manhole with water to within 4 inches of top of cover frame. Prior to test, allow manhole to soak from minimum of 4 hours to maximum of 72 hours; after soak period, adjust water level inside manhole to within 4 inches of top of cover frame.
4. Measure water level from top of manhole frame; at end of 4 hour test period, again measure water level from top of manhole frame; compute drop in water level during test period.
5. Manhole exfiltration test is considered satisfactory when drop in water level is less than values listed in table below:

Manhole Depth (feet)	Allowable Leakage (Inches for Manhole Diameter)		
	4 feet	5 feet	6 feet
4	0.11	0.14	0.17
6	0.17	0.21	0.26
8	0.23	0.29	0.35
10	0.28	0.35	0.42
12	0.34	0.43	0.51
14	0.40	0.50	0.60
16	0.45	0.56	0.68
18	0.51	0.64	0.77
20	0.57	0.71	0.86
22	0.62	0.78	0.93
24	0.68	0.85	1.02
26	0.74	0.93	1.11
28	0.79	0.99	1.19
30	0.85	1.06	1.28

6. When unsatisfactory test results are achieved, repair manhole and retest until result meets criteria; repair visible leaks regardless of quantity of leakage.

END OF SECTION

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SECTION 33 05 13.16
PUBLIC MANHOLES AND STRUCTURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Precast reinforced concrete manholes and structures with tongue-and-groove joints with masonry transition to frames, lids, grates, anchorage, and accessories.
2. Masonry manhole and structure sections with masonry transition to frames, lids, grates, anchorage, and accessories.
3. Cast-in-place concrete manholes and structures with masonry transition to frames, lids, grates, covers, anchorage, and accessories.
4. Structure connections to existing public utility lines.
5. Bedding and backfill materials.

B. Related Sections:

1. Section 31 23 17 - Trenching: Excavating and backfilling for manholes, structures, and foundation slabs.
2. Section 33 01 30.63– Subsurface Manhole Rehabilitation
3. Section 33 01 32 - Sewer and Manhole Testing.

1.2 REFERENCES

A. American Concrete Institute:

1. ACI 530/530.1 - Building Code Requirements for Masonry Structures and Specifications for Masonry Structures.

B. ASTM International:

1. ASTM A48 - Standard Specification for Gray Iron Castings.
2. ASTM C32 - Standard Specification for Sewer and Manhole Brick (Solid Masonry Units Made From Clay or Shale).
3. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
4. ASTM C55 - Standard Specification for Concrete Brick.
5. ASTM C443 – Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber gaskets.
6. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
7. ASTM C497 - Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile.
8. ASTM C857 - Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
9. ASTM C890 - Standard Practice for Minimum Structural Design Loading for Monolithic or Section Precast Concrete Water and Wastewater Structures.
10. ASTM C891 - Standard Practice for Installation of Underground Precast Concrete Utility Structures.
11. ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures.

12. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals.
 13. ASTM C990 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.
- C. National Precast Concrete Association:
1. NPCA Quality Control Manual for Precast Plants.
 2. NPCA Plant Certification Program.
- D. SCDOT Standard Specifications:
1. Standard Specifications for Highway Construction, 2007, published by the South Carolina Department of Transportation.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Shop Drawings:
1. Standard Fabrication: Indicate structure locations, elevations, sections, equipment support, piping sizes, and elevations of penetrations.
 2. Custom Fabrication: Indicate design, construction and installation details, typical reinforcement and additional reinforcement at openings for each custom type, size and configuration.
- C. Product Data: Submit manhole frames and lids, accessories, component construction, features, configuration, dimensions, and joint data.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- E. Project Record Documents: Record actual locations of manholes and structures with rim and invert elevations.
- F. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.4 QUALITY ASSURANCE

- A. Obtain precast concrete utility structures from single source.
- B. Perform Work in accordance with Section 719 of SCDOT Standard Specifications.
- C. Maintain one copy of document on site.

1.5 QUALIFICATIONS

- A. Manufacturer: Certified by NPCA Plant Certification Program prior to and during Work of this section.
- B. Installer: Company specializing in performing work of this Section with minimum five years experience.
- C. Design custom utility structures under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of South Carolina.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Comply with precast concrete manufacturer's instructions and ASTM C913 for unloading, storing and moving precast manholes and drainage structures.
- B. Store precast concrete manholes and drainage structures to prevent damage to Owner's property or other public or private property. Repair property damaged from materials storage.
- C. Mark each precast structure by indentation or waterproof paint showing date of manufacture, manufacturer and identifying symbols, and numbers shown on Drawings to indicate its intended use.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Masonry Work: Maintain materials and surrounding air temperature to minimum 50 degrees F prior to, during, and 48 hours after completion of masonry work.
- B. Cold Weather Requirements: ACI 530/530.1.

PART 2 PRODUCTS

2.1 PRECAST REINFORCED MANHOLES AND STRUCTURES

- A. Precast Manhole and Structure Sections: Reinforced precast concrete in accordance with ASTM C478.
 - 1. Portland Cement: Type II, 4,000 psi (absorption shall not exceed 6%)
 - 2. Joints for Precast Manholes and Structures for Sanitary Utility Sewer Service: O-ring rubber gaskets in accordance with ASTM C443.
 - 3. Joints for Precast Manholes and Structures for Other Utility uses: Butyl rubber gaskets in accordance with ASTM C990.
 - 4. Size - 8" to 15" – 4' Diameter
- 16" to 30" – 5' Diameter
 - 5. Wall Thickness – 5"
 - 6. Wetwell Wall Thickness – 10" (match existing structure in field)
 - 7. Cone Section Thickness – 8" @ top

8. Flat slab top sections (wetwell slab & Air release Manholes) to be HS-20 traffic rated.

2.2 MASONRY CONSTRUCTION

- A. Concrete Brick: ASTM C55, Grade S, Type II - Non-moisture controlled; except that the absorption of brick shall not exceed 10 lbs / cubic foot.
- B. Clay or Shale Brick: ASTM C32, Grade SW, solid units.
- C. Mortar: Conform to Division 700 of SCDOT Standard Specifications proportioned as described below. Do not add more water than is necessary to make a workable mixture.
 1. Mix No. 1: 1 part Portland cement, 1/4 part hydrated lime, 3-3/4 parts mortar sand (maximum).
 2. Mix No. 2: 1 part Portland cement, 1 part masonry cement, 6 parts mortar sand (maximum).
- D. Grout: Non-shrink, non-metallic in accordance with Division 700 of SCDOT Standard Specifications with a compressive strength of at least 5,000 psi at 3 days.

2.3 CAST-IN-PLACE CONCRETE

- A. Concrete: Class A Concrete conforming to Division 700 of the SCDOT Standard Specifications.
 1. Compressive strength of 3,000 psi at 28 days.
 2. Air entrained.
 3. Water cement ratio of 0.488 with rounded aggregate and 0.532 with angular aggregate.
 4. Maximum slump of 3.5 inch for vibrated concrete and 4 inch for non-vibrated concrete.
 5. Minimum cement content of 564 pounds per cubic yard for vibrated concrete and 602 pounds per cubic yard for non-vibrated concrete.

2.4 FRAMES AND COVERS

- A. Manhole cover and frame shall be PAMREX or approved equal. Cover and frame shall be manufactured from ductile iron in a foundry fully certified under the requirements ISO 9000:2000. Product design will require that covers are hinged and incorporate a 90-degree blocking system to prevent accidental closure. Cover will allow automatic release of back pressure. Frame shall come complete with an open hinge box and a hinge infiltration plug. Covers shall be one-man operable using standard tools and shall be capable of withstanding a test load of 120,000 lbs. Covers shall be capable of receiving a retrofit badge through use of a punch-out design. Frames shall be circular and shall incorporate a seating ring capable of traffic. Product will be available in a 24-inch clear opening. The frame depth shall not exceed 4 inches, and the flange shall incorporate bedding slots and bolt holes. All components shall be black coated.
- B. Frame Weight: 73 lbs. Cover Weight: 122 lbs. Total Weight: 195 lbs
- C. All Product shall meet the requirements of EN124:1994.
- D. Leveling and final grading of manhole frames and covers shall be accomplished by using a maximum of two (2) 4" concrete grade rings or one (1) 6" grade ring. Use cement brick

for adjustments less than 4” The total number of grade rings shall not exceed 8” in thickness. Grade rings and cement brick shall be laid in a full bed of non-shrink grout and covered after laying with a smooth coating on non-shrink grout or hydraulic cement a minimum of ½” thick.

- E. After the manhole has been set in its final position, the ductile iron frame for the cover shall be carefully set above finished grade and properly bonded to the masonry with non-shrinking cement grout or hydraulic cement. Where manholes are constructed in paved areas, sidewalks, etc., the top surface of the frame and cover shall be tilted so as to conform to the exact slope crown and grade of the existing pavement.
- F. Locking kits will required unless approved otherwise by the Department.

2.5 CONFIGURATION

- A. Provide size and shape as indicated on Drawings.
- B. Foundation Slab: Cast-in-place or precast reinforced concrete integral with bottom section, level top surface.

2.6 ACCESSORIES

- A. Steps: Conform to ASTM C-478 and current OSHA Regulations, minimum 12 inches wide spaced vertically 16 inches on center, made of copolymer polypropylene plastic encapsulating ½” grade 60 steel reinforcement. Vertical load resistance of 400 lbs and minimum pull-out resistance of 1000 lbs.
- B. Strap Anchors: Stainless steel capable of supporting pipe or accessories indicated on Drawings, minimum 1 inch wide x 1/8 inch thick.
- C. Geotextile Filter Fabric: Type 1 Engineering fabric in accordance with Section 804 of SCDOT Standard Specifications; non-woven, needle punched, non-biodegradable, and rot-proof.
- D. Interior Manhole Coating: Provide in Manholes (new or existing) where a force main enters and in the next manhole down stream as specified in Section 33 01 30.63.
- E. Watertight Polyethylene Manhole Insert:
 - 1. Manufacturers:
 - a. Parsons.
 - b. Or Equal per Engineer.

2.7 BEDDING AND BACKFILL MATERIALS

- A. Bedding: 12” thick clean course aggregate Gradation No. 57 conforming to Division 700 and 800 of the SCDOT Standard Specifications.

- B. Backfill around Structures:
 - 1. Reuse of existing excavated materials will be allowed provided the materials are compactible, dried, or dampened to their optimum moisture content, are free from voids, large clods of clay, and are granular and non-cohesive in nature.
 - 2. Select fill shall be sand-clay, fine sand or sand gravel mixes with a maximum of 25% passing a wash #200 sieve. As specified in Section 31 23 16 – Excavation and Fill and Section 31 23 17 – Trenching.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify items provided by other Sections of Work are properly sized and located.
- B. Verify built-in items are in proper location and ready for roughing into Work.
- C. Verify correct size of manhole and structure excavation.

3.2 PREPARATION

- A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other Sections.
- B. Do not install manholes and structures where site conditions induce loads exceeding structural capacity of manholes or structures.
- C. Inspect precast concrete manholes and structures immediately prior to placement in excavation to verify manholes and structures are internally clean and free from damage. Remove and replace damaged units.

3.3 INSTALLATION – GENERAL

- A. Excavation and Backfill:
 - 1. Excavate and backfill for manholes and structures in accordance with Section 31 23 17 – Trenching in location and to depth shown. Provide clearance around sidewalls of manhole or structure for construction operations, backfill, and placement of geotextile filter fabric if required.
 - 2. When groundwater is encountered, prevent accumulation of water in excavations. Place manholes or structures in dry trench.
 - 3. Where possibility exists of watertight manhole or structure becoming buoyant in flooded excavation, anchor manhole or structure to avoid flotation.
- B. Place foundation slab, trowel top surface level.
- C. Place precast manhole sections plumb and level, trim to correct elevations, anchor to foundation slab.
- D. As Work progresses, install steps and other fabricated metal items.

- E. Install cast-in-place manholes and structures supported at proper grade and alignment as shown on Drawings.
- F. Cut pipe to connect to structure as indicated on Drawings.
- G. Grout base of shaft sections to achieve slope to exit piping. Trowel smooth. Contour to form continuous drainage channel as indicated on Drawings.
- H. Set cover frames and covers level without tipping, to correct elevations.

3.4 PRECAST CONCRETE MANHOLE AND STRUCTURE INSTALLATION

- A. Install underground precast utility structures in accordance with ASTM C891.
- B. Lift precast manholes and structures at lifting points designated by manufacturer.
- C. When lowering manholes and structures into excavations and joining pipe to units, take precautions to ensure interior of pipeline and manhole or structure remains clean.
- D. Set precast manholes and structures bearing firmly and fully on stone bedding, 12-inch minimum thickness, compacted to 95 percent maximum density per Section 31 23 17 – Trenching or on other support system shown on Drawings.
- E. Assemble multi-section manholes and structures by lowering each section into excavation. Install rubber gasket joints between precast sections in accordance with manufacturer's recommendations. Lower, set level, and firmly position base section before placing additional sections.
- F. Remove foreign materials from joint surfaces and verify sealing materials are placed properly. Maintain alignment between sections by using guide devices affixed to lower section.
- G. Joint sealing materials may be installed on site or at manufacturer's plant.
- H. Verify manholes and structures installed satisfy required alignment and grade.
- I. Remove knockouts or cut structure to receive piping without creating openings larger than required to receive pipe. Fill annular space with non-shrink grout.

3.5 CONNECTION TO EXISTING SEWER WITH MANHOLE

- A. Stake out location and burial depth of existing sewer line in area of proposed manhole or structure.
- B. Carefully excavate around existing sewer line to adequate depth for foundation slab installation. Protect existing pipe from damage. Cut out soft spots and replace with granular fill compacted to 95 percent maximum dry density per Section 31 23 17 – Trenching.

- C. Prepare crushed stone bedding or other support system shown on Drawings, to receive foundation slab as specified for precast manholes and structures.
- D. Install manhole or structure around existing pipe in accordance with the appropriate paragraphs specified herein.
- E. Block upstream flow at existing manhole or structure with expandable plug.
- F. If flow is excessive, pump flow around new manhole to existing downstream manhole.
- G. Use hydraulic saw to cut existing pipe at manhole or structure entrance and exit and along pipe length at a point halfway up the outside diameter on each side of the pipe. Bottom half of pipe shall remain as manhole flow channel. Saw cut to have a smooth finish with top half of pipe flush with interior of manhole or structure.

3.6 SANITARY MANHOLE DROP CONNECTIONS

- A. Construct drop connections into sanitary manholes in accordance with Drawings.
- B. Concrete encase pipe drop connection to minimum of 2 feet outside of manhole.
- C. Form channel from pipe drop to sweep into main channel at maximum angle of 45 degrees.

3.7 CASTINGS INSTALLATION

- A. Set frames using mortar and masonry as indicated on Drawings. Install radially laid concrete brick with 1/4 inch thick vertical joints at inside perimeter. Lay concrete brick in full bed of mortar and completely fill joints. Where more than one course of concrete brick is required, stagger vertical joints.
- B. Do not install more than 3 courses of brick or more than 12 inches of masonry.

3.8 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Perform soil compaction tests in accordance with Section 31 23 17 – Trenching.
- C. Perform hydrostatic tests in accordance with Section 33 01 32 – Sewer and Manhole Testing.
 - 1. Notify Engineer 72 hours in advance of test and have witness test.
- D. Test cast-in-place concrete in accordance with ASTM C39.
- E. Test concrete manhole and structure sections in accordance with ASTM C497.
- F. Vertical Adjustment of Existing Manholes and Structures:

1. Where required, adjust top elevation of existing manholes and structures to finished grades shown on Drawings.
2. Reset existing frames, grates and covers, carefully removed, cleaned of mortar fragments, to required elevation in accordance with requirements specified for installation of castings.
3. Remove concrete without damaging existing vertical reinforcing bars when removal of existing concrete wall is required. Clean vertical bars of concrete and bend into new concrete top slab or splice to required vertical reinforcement, as indicated on Drawings.
4. Clean and apply sand-cement bonding compound on existing concrete surfaces to receive cast-in-place concrete.

END OF SECTION

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SECTION 33 05 19
PRESSURE PIPING TIED JOINT RESTRAINT SYSTEM

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Tied joint restraint system.
- B. Related Sections:
 - 1. Section 31 23 17 – Trenching: Excavation and Backfill for Work of this Section.
 - 2. Section 33 34 00 – Sanitary Sewerage Force Main.

1.2 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. ANSI B1.1 - Unified Inch Screw Threads.
- B. ASTM International (ASTM):
 - 1. ASTM A36 - Standard Specification for Carbon Structural Steel.
 - 2. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 3. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 4. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - 5. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 - 6. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
 - 7. ASTM A588 - Specification for High Strength Low-Alloy Structural Steel up to 50 ksi (345 MPa) Minimum Yield Point with Atmospheric Corrosion Resistance.
 - 8. ASTM B633 - Specification for Electrodeposited Coating of Zinc on Iron and Steel.
 - 9. ASTM F436 – Standard Specification for Hardened Steel Washers.

1.3 DESIGN REQUIREMENTS

- A. Provide pressure pipeline with restrained joints at bends, tees, and changes in direction.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Shop Drawings: Indicate restrained joint details and materials being utilized. Submit layout drawings showing piece numbers and locations. Also, indicate restrained joint locations.
- C. Product Data: Submit catalog data for restrained joint details and installation instructions.

- D. Design Data: Submit design calculations showing determination of restrained lengths and submit joint restraint details. Use joint restraint devices specifically designed for applications described in manufacturer's data.
- E. Manufacturer's Installation Instructions: Submit installation instructions.
- F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- G. Project Record Documents: Record actual locations of joint restraints.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum 3 years experience.
- B. Installer: Company specializing in performing work of this Section with minimum 3 years documented experience.

PART 2 PRODUCTS

2.1 TIED JOINT RESTRAINT SYSTEM

- A. Manufacturers:
 - 1. Dresser Piping Specialties.
 - 2. Ebaa Iron Sales, Inc.
 - 3. Star Pipe Products, Inc.
 - 4. Substitutions: Equal per Section 00 21 13- Instructions to Bidders.

2.2 MATERIALS

- A. Steel Types:
 - 1. High Strength Low-Alloy Steel, ASTM A588, heat-treated.
 - 2. High Strength Low-Alloy Steel, ASTM A588.
 - 3. Carbon Steel ASTM A36.

2.3 COMPONENTS

- A. Tie Bolts:
 - 1. 5/8 inch for 2 inch and 3 inch mechanical joints, 3/4 inch for 4 inch to 12 inch mechanical joints and flanged joints, ASTM A588, Grade B; ASTM A325, Type 3, except increase tensile strength of full-body threaded section to 40,000 pounds minimum for 5/8 inch and 60,000 pounds minimum for 3/4 inch by heat-treating (quenching and tempering) to manufacturer's reheat and hardness specifications.
 - 2. 3/4 inch for 14 inch to 24 inch mechanical joints, ASTM A588, Grade B; ASTM A325, Type 3.
 - 3. 1 inch for 30 inches and larger mechanical joints and flanged joints, ASTM A588/, Grade B; ASTM A325, Type 3; except increase tensile strength of full-body thread section to 100,000

pounds minimum by heat-treating (quenching and tempering) to manufacturer's reheat and hardness specifications.

- B. Tie Nut: Hex nut for each tie bolt and tie rods; ASTM A563, Grade C3; plain, zinc plated, or galvanized.
- C. Tiepin: 3/4 inch round bar stock for use on bends and hydrants, 6-inch hairpin shape, ASTM A588; ANSI B1.1; plain, zinc plated, or galvanized.
- D. Tie Coupling: Used to extend continuous threaded rods and provided with center stop to aid installation; ASTM A588; plain, zinc plated, or galvanized.
- E. Tie Clamp: Retainer clamp for ductile iron, asbestos cement and polyvinyl chlorite, push-on pipe in front of bell; ASTM A36; ASTM A307; ASTM A563, Grade A; plain, zinc plated, or galvanized.
- F. Tie Rod: Continuous threaded rod for cutting to desired lengths; ASTM A588, Grade B; ASTM A325, Type 3; ANSI B1.1; plain zinc plated, or galvanized.
- G. Tie Bar: Steel bar used to restrain push-in plugs; ASTM A36; plain, zinc plated, or galvanized.
- H. Tie Washer: Round flat washers; ASTM A588, ASTM F436, Type 3; plain, zinc plated, or galvanized.

2.4 FACTORY APPLIED FINISHES – STEEL

- A. Items to be zinc plated or galvanized to meet the following requirements:
 - 1. ASTM B633 for electrodeposited coating of zinc on steel.
 - 2. ASTM A153 for galvanizing iron and steel hardware.
 - 3. Galvanizing for rolled, pressed, and forged steel shapes: ASTM A123; minimum 2.0 ounces per square foot coating thickness; galvanize after fabrication.

PART 3 EXECUTION

3.1 PREPARATION

- A. Verify pipe and fittings are ready to receive work.
- B. Field measure and verify conditions.
- C. Clean surfaces of pipe and fittings to receive tied joint restraint system.

3.2 INSTALLATION

- A. Excavate and Backfill in accordance with Section 31 23 17 - Trenching.
- B. Install pipe and fittings in accordance with Section 33 34 00 – Sanitary Utility Sewerage Force Mains.

- C. Install joint restraint system so joints are mechanically locked together to prevent joint separation.

3.3 ERECTION TOLERANCES

- A. Torque nuts on mating threaded fasteners to 45-foot pounds to 60-foot pounds for 5/8 inch nut.
- B. Torque nuts on mating threaded fasteners to 75-foot pounds to 90-foot pounds for 3/4 inch nut.
- C. Torque 1 inch nuts to 100-foot pounds to 120-foot pounds.

END OF SECTION

SECTION 33 05 23
TRENCHLESS UTILITY INSTALLATION (JACKING)

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Excavation and backfill for approach trenches and pits.
 - 2. Excavation for Casing pipe.
 - 3. Carrier pipe.
 - 4. Disposal of excess materials.

- B. Related Sections:
 - 1. Section 31 23 17 - Trenching: Excavating and backfilling access pits.
 - 2. Section 33 01 32 - Sewer and Manhole Testing.
 - 3. Section 33 31 00 - Sanitary Sewerage Piping.
 - 4. Section 33 34 00 - Sanitary Sewerage Force Mains.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO H20 - Standard Specification for Live Loading.
 - 2. AASHTO M133 - Standard Specification for Preservatives and Pressure Treatment Processes for Timber.

- B. American Railway Engineering and Maintenance-of-Way Association:
 - 1. AREMA - Manual for Railway Engineering.

- C. ASTM International:
 - 1. ASTM A36 - Standard Specification for Carbon Structural Steel.
 - 2. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 3. ASTM A139 - Standard Specification for Electric fusion (Arc) Welded steel Pipe (NPS 4-inch and over).
 - 4. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - 5. ASTM A449 - Standard Specification for Quenched and Tempered Steel Bolts and Studs.
 - 6. ASTM A1011 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

- D. American Welding Society:
 - 1. AWS D1.1 - Structural Welding Code - Steel.

- E. National Utility Contractors Association:
 - 1. NUCA - Pipe Jacking & Micro-tunneling Design Guide.
 - 2. NUCA - Trenchless Excavation Construction Equipment & Methods Manual.

- F. SCDOT Standard Specifications:
 - 1. Standard Specifications for Highway Construction, 2007, published by the South Carolina Department of Transportation.

- G. Norfolk Southern NSCE-8 SPECIFICATIONS

1.3 DESIGN REQUIREMENTS

- A. The end of casing pipe to extend a minimum of six (6) feet from the edge of pavement / back of curb.
- B. The top of the casing pipe shall be a minimum of four (4) feet below the crown of the finished asphalt roadway.
- C. For Railroad Crossings Refer to Norfolk Southern NSCE-8 specifications and approved "Encroachment Permit"
 - 1. Casing Pipes under NS tracks shall be not be less than 5-1/2' from the base of rail to top of pipe at its closest point.
 - 2. On other portions of the right-of-way, where the pipe is not directly beneath any track, the depth from the ground surface will be 4'.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals
- B. Shop Drawings: Prepare scaled shop Drawings to supplement Drawings, signed and sealed by Professional Engineer.
 - 1. Include details of casing, jacking head, sheeting, and other falsework for trenches and pits and support for adjacent facilities, field sketches, and other details to complete the Work.
 - 2. Show relation of proposed installation to adjacent facilities and natural features over installation, angle of installation, right-of-way lines, and general layout of built facilities.
 - 3. Show cross-section or sections from field survey showing installation in relation to actual profile of ground.
- C. Submit history of previous work completed of equivalent nature and scope. Include qualification and experience of key personnel.
- D. Installation Plan: Submit description of proposed construction plan, dewatering plan, and plan to establish and maintain vertical and horizontal alignment.
- E. Submit emergency response procedures to handle situations when conduit is compromised and jeopardizes integrity of installation or safety.
- F. Submit written report results of visual check prior to installation of carrier pipe of entire length of casing or liner, to verify there are no voids or defective joints.
- G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of casing or tunnel liner, carrier pipe, and invert elevations.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

- A. Perform work in accordance with the latest SCDOT Standard Specifications, the “Utilities Accommodation Manual” dated September 1, 2011, the NUCA Trenchless Excavation Construction Equipment and Methods Manual, NUCA Pipe Jacking & Micro-tunneling Design Guide, and AREMA when jacking under railroads.
- B. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

- A. Installer: Company specializing in performing work of this section with minimum five years documented experience.
 - 1. Work Experience: Include projects of similar magnitude and conditions.
 - 2. Furnish list of references upon request.

1.8 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this Section.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- B. Protect piping and jacking systems from entry of foreign materials and water by temporary covers, completing sections of work, and isolating parts of completed system.
- C. Accept system components on site in manufacturer’s original containers or configuration. Inspect for damage.
- D. Use wooden shipping braces between layers of stacked pipe. Stack piping lengths no more than three layers high.
- E. Store field joint materials indoors in dry area in original shipping containers. Maintain storage temperature of 60 to 85 degrees F.
- F. Support casing and carrier pipes with nylon slings during handling.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Conduct operations so as not to interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures or utilities, and landscape in immediate or adjacent areas.

1.11 FIELD MEASUREMENTS

- A. Verify invert elevations of existing work prior to excavation and installation of casing or tunnel.

PART 2 PRODUCTS

2.1 CASING AND JACKING PIPE MATERIALS

- A. Steel Casing Pipe: Steel complying with ASTM A139 for Grade B with minimum yield strength of 35,000 psi.
- B. Provide ends suitable for field welding.
- C. Minimum wall thickness as follows:

<u>Diameter of Casing</u>	<u>Minimum Wall Thickness</u>
16 thru 24	1/4"
28 thru 32	1/2"

2.2 CARRIER PIPE MATERIALS

- A. DIP - Sanitary Utility Sewerage Force Mains: As specified in Section 33 34 00.

2.3 PIPELINE CASING SPACERS

- A. For piping installed in casing provide pipeline casing spacers.
- B. Provide a minimum of 1 spacer per ten linear feet of pipe for ductile iron pipe and a minimum of 1 spacer per six linear feet for PVC pipe.
- C. Provide spacer with shell of 14-gauge T-316 stainless steel
- D. Provide shell liner of .090" thick PVC, 85-90 durometer.
- E. Provide 5/16" stainless steel connecting bolts and lock nuts, minimum three (3) per flange.
- F. Runners from 2' wide ultra-high molecular weight polymer with a high resistance to abrasion and a coefficient of friction of 0.11-0.13 in accordance with ASTM D 1894
- G. Support runners on 14-gauge reinforced T-316 stainless steel risers welded to shell.
- H. All metal surfaces to be fully passivated.

- I. The diameter as measured over the runners shall exceed the pipeline bell or coupling outside diameter.
- J. Provide pipeline casing spacers as manufactured by Cascade Manufacturing, Pipeline Seal and Insulator, Inc. or approved equal.

2.4 End Seals

- A. Provide 1/8" thick rubber end seal to seal each end of the casing.
- B. Secure to casing and carrier pipe with T-316 stainless steel bands.
- C. Acceptable manufacturers: Cascade Manufacturing, Pipeline Seal and Insulator, Inc. or approved equal.

2.5 COVER MATERIALS

- A. Soil Backfill for Trench Approaches and Pits to Finish Grade: As specified in Section 33 23 17 - Trenching.

2.6 ACCESSORIES

- A. Supports and Insulators:
 - 1. Steel and Plastic: 14 gage stainless steel band, 5/16-inch stainless steel flange bolts, heavy duty PVC liner, polyethylene or phenolic skids.
 - 2. Plastic: Polyethylene casing insulator band and skids with stainless steel bolts.
- B. Steel Strapping: ASTM A36.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify connection to existing piping system size, location, and invert elevations are in accordance with Drawings.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Locate, identify, and protect utilities indicated to remain from damage.
- C. Notify utility company to remove and relocate utilities.
- D. Protect plant life, lawns, rock outcroppings] and other features remaining as portion of final landscaping.

- E. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- F. Establish minimum separation of from other utility piping in accordance with local code.

3.3 EXCAVATION AND BACKFILL

- A. Excavate and backfill in accordance with Section 31 23 17 - Trenching.

3.4 DEWATERING

- A. Intercept and divert surface drainage precipitation and groundwater away from excavation through use of dikes, curb walls, ditches, pipes, sumps, or other means.
- B. Develop substantially dry subgrade for prosecution of subsequent operations.
- C. Comply with SCDHEC requirements for dewatering to any watercourse, prevention of stream degradation, and erosion and sediment control.

3.5 EXISTING WORK

- A. Maintain access to existing facilities and other remaining active installations requiring access. Modify installation as necessary to maintain access.

3.6 PITS OR APPROACH TRENCHES

- A. Excavate approach trenches or pits in accordance with shop drawings and as site conditions require.
- B. Ensure casing entrance face as near perpendicular to alignment as conditions permit.
- C. Establish vertical entrance face at least 1 foot above top of casing.
- D. Install dewatering measures and excavation supports as specified in Section 31 23 17 - Trenching.

3.7 CASING PIPE INSTALLATION

- A. Boring:
 - 1. Push pipe into ground with boring auger rotating within pipe to remove spoil. Do not advance cutting head ahead of casing pipe except for distance necessary to permit cutting teeth to cut clearance for pipe. Arrange machine bore and cutting head to be removable from within pipe. Arrange face of cutting head to provide barrier to free flow of soft material.
 - 2. When unstable soil is encountered during boring retract cutting head into casing to permit balance between pushing pressure and ratio of pipe advancement to quantity of soil.
 - 3. When voids develop greater than outside diameter of pipe by approximately one inch, grout to fill voids.
 - 4. When boring is obstructed, abandon boring, relocate jack or tunnel as directed by Engineer.
- B. Jacking
 - 1. Construct adequate thrust wall normal to proposed line of thrust.

2. Impart thrust load to pipe through suitable thrust ring sufficiently rigid to ensure uniform distribution of thrust load on full pipe circumference.

C. Drilling and Jacking

1. Use oil field type rock roller bit or plate bit made up of individual roller cutter units solidly welded to pipe which is turned and pushed for its entire length by drilling machine to give bit necessary cutting action.
2. Inject high density slurry (oil field drilling mud) to head as cutter lubricant. Inject slurry at rear of cutter units to prevent jetting action ahead of pipe.

- D. Mining and Jacking: Utilize manual hand-mining excavation from within casing pipe as casing is advanced with jacks, allowing minimum ground standup time ahead of casing pipe.

3.8 PRESSURE GROUTING

- A. Pressure grout annular space between casing pipe and surrounding earth.

3.9 CARRIER PIPE INSTALLATION

- A. Clean, inspect, and handle pipe in accordance with applicable Section for carrier pipe.
- B. Exercise care to prevent damage to pipe joints when carrier pipe is placed in casing.
- C. Support pipeline within casing so no external loads are transmitted to carrier pipe. Attach supports to barrel of carrier pipe; do not rest carrier pipe on bells.
1. Use minimum 2 supports per joint of carrier pipe.
- D. Seal Ends per section 2.4.

3.10 TOLERANCES

- A. Do not over cut excavation by more than 1 inch greater than outside diameter of casing pipe.
- B. Install casing pipe to vertical and horizontal alignment on Drawings within plus or minus 3 inches prior to installation of carrier pipe.
- C. Install pipe bells with minimum ½-inch clearance to casing.

3.11 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting and testing.
- B. Compaction Testing: As specified in Section 31 23 17 - Trenching.
- C. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

3.12 REMOVAL OF FACILITIES AND CONTROLS

- A. Remove temporary facilities for casing installation and jacking operations in accordance with Section 01 50 00 - Temporary Facilities and Controls.

END OF SECTION

SECTION 33 31 00
SANITARY UTILITY SEWERAGE PIPING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Sanitary sewer pipe and fittings.
 2. Underground pipe markers.
 3. Connection to existing manholes.
 4. Wye branches and tees.
 5. Sanitary Laterals.
- B. Related Sections:
1. Section 31 23 17 – Trenching: Excavation, bedding and backfill requirements for trenching required by this section.
 2. Section 33 05 13.16 – Utility Manholes and Structures: Concrete manholes, frames and lids for sanitary sewer

1.2 REFERENCES

- A. ASTM International:
1. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings.
 2. ASTM A746 - Standard Specification for Ductile Iron Gravity Sewer Pipe.
 3. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
 4. ASTM C425 - Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings.
 5. ASTM C443 - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
 6. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
 7. ASTM C923 - Standard Specification for Resilient Connectors between Reinforced Concrete Manhole Structures, Pipes and Laterals.
 8. ASTM C1479 - Standard Practice for Installation of Precast Concrete Sewer, Storm Drain, and Culvert Pipe Using Standard Installations.
 9. ASTM D2235 - Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
 10. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
 11. ASTM D2564 - Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
 12. ASTM D2729 - Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
 13. ASTM D2751 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.

14. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
 15. ASTM D3034 - Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
 16. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- B. American Water Works Association:
1. AWWA C110 - American National Standard for Ductile-Iron and Grey-Iron Fittings, 3 in. Through 48 in. (75 mm through 1200 mm), for Water and Other Liquids.
 2. AWWA C111 - American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
 3. AWWA C153 - American National Standard for Ductile-Iron Compact Fittings for Water Service.
 4. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
- C. SCDOT Standard Specifications:
1. Standard Specifications for Highway Construction, 2007, published by the South Carolina Department of Transportation.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Permits: Submit copies of construction permits obtained for this Work.
- C. Product Data: Submit catalog cuts and other pertinent data indicating proposed materials, accessories, details, and construction information.
- D. Submit reports indicating field tests made and results obtained.
- E. Manufacturer's Installation Instructions:
 1. Indicate special procedures required to install Products specified.
 2. Submit detailed description of procedures for connecting new sewer to existing sewer line and directional drilling, or pipe jacking installation.
- F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record location of pipe runs, connections, manholes, cleanouts, and invert elevations.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with SCDOT Standard Specifications.
- B. Maintain one copy of document on site.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum 3 years documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store valves in shipping containers with labeling in place.
- B. Block individual and stockpiled pipe lengths to prevent moving.
- C. Do not place pipe or pipe materials on private property or in areas obstructing pedestrian or vehicle traffic.
- D. Do not place pipe flat on ground. Cradle to prevent point stress.
- E. Store UV sensitive materials out of direct sunlight.

1.8 FIELD MEASUREMENTS

- A. Verify field measurements and elevations are as indicated.

1.9 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.
- B. Coordinate Work with local sewerage authority. Convene pre-installation meeting minimum of one week prior to starting Work of this Section.
- C. Notify affected utility companies minimum of 72 hours prior to construction.

PART 2 PRODUCTS

2.1 SANITARY SEWER PIPE AND FITTINGS

- A. PVC Flexible Joint Plastic Pipe (8-inch through 16"): ASTM D3034, Type PSM, Poly (Vinyl Chloride) (PVC) material; bell and spigot style rubber ring sealed gasket joint.
 - 1. Pipe Class: SDR 26.
 - 2. Fittings: PVC conforming to pipe specifications.

3. Joints: ASTM-D 3212, elastomeric gaskets.
- B. PVC Sewer Pipe (18 inch through 48 inch): ASTM F679
1. Pipe Class: PS46
 2. Fittings: PVC conforming to pipe specifications
 3. Joints: ASTM-D 3212, elastomeric gaskets
- C. Ductile Iron Gravity Sewer Pipe: ANSI A21.50 (AWWA C150), ANSI A21.51(AWWA C151), bell and spigot ends. Conforming to ASTM A-377.
1. Pipe Class (8"-12"): class 350 psi.
 2. Pipe Class (14" and larger): class 150 psi.
 3. Fittings: Ductile iron, AWWA C110. Compact fittings, AWWA C153.
 4. Joints: Rubber gaskets per ANSI A21.10 (AWWA C111).
 5. Pipe shall have push-on-joints, mechanical joints, flanged joints, or restrained joints as required. (see plans for restrained joint locations)
 6. Lining: Amine cured Novalac Epoxy polymeric lining, 40 mils nominal thickness. Protecto 401 by Vulcan Painters, Birmingham, Alabama, 40 mils nominal thickness.

2.2 FLEXIBLE PIPE BOOT FOR MANHOLE PIPE ENTRANCES

- A. Furnish materials in accordance with authority having jurisdiction.
- B. Flexible Pipe Boot: ASTM C923, ethylene propylene rubber (EPDM), Series 300 stainless steel clamp and stainless steel hardware.

2.3 UNDERGROUND PIPE MARKERS

- A. Plastic Ribbon Tape:
1. All DIP & PVC gravity sewer installations shall include the installation of an electronically or magnetically detectable safety tape buried directly over the pipe 12" below the ground surface continuously. The tape shall be at least 2" wide, be green on top, and be boldly labeled every 18" to 32" as follows "CAUTION SEWER LINE BURED BELOW". The tape shall have a tensile strength of not less than 4000 psi, a dart impact strength of not less than 120 grams per 1. Mils, be not less than 0.0055" thick, and include sufficient metal to allow easy detection at the above stated depths.

2.4 MANHOLES

- A. Manholes: As specified in Section 33 05 13.16 and indicated on Drawing.

2.5 CONCRETE AND GROUT

- A. Concrete: Class A Concrete conforming to Division 500 of the SCDOT Standard Specifications.
1. Compressive strength of 3,000 psi at 28 days.
 2. Air entrained.

3. Water cement ratio of 0.488 with rounded aggregate and 0.532 with angular aggregate.
 4. Maximum slump of 3.5 inch for vibrated concrete and 4 inch for non-vibrated concrete.
 5. Minimum cement content of 564 pounds per cubic yard for vibrated concrete and 602 pounds per cubic yard for non-vibrated concrete.
- B. Grout: Non-shrink, non-metallic in accordance with Divisions 500 and 700 of SCDOT Standard Specifications with a compressive strength of at least 5,000 psi at 3 days.

2.6 BEDDING AND COVER MATERIALS

- A. Bedding for Rigid Pipe (DIP, PVC C900, PVC C905):
1. Class B (Type 2) Foundation Stone: Clean course aggregate Gradation No. 57 conforming to Sections 801 of the SCDOT Standard Specifications.
 2. In lieu of Class B (Type 2) bedding, fine granular fill may be used from the excavation provided that the trench is dewatered prior to excavation and a dry trench is maintained until the pipeline is completely backfilled.
- B. Bedding for Flexible Pipe (PVC, ABS): Clean course aggregate Gradation No. 57 conforming to Division 700 of the SCDOT Standard Specifications.
- C. Backfill around Pipe and Above Pipe: As specified in Section 31 23 17 -Trenching.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify existing sanitary sewer utility main size, location, and inverts are as indicated on Drawings.

3.2 EXCAVATION AND BEDDING

- A. Excavate pipe trench in accordance with Section 31 23 17.
- B. Excavate to lines and grades shown on Drawings or required to accommodate installation of encasement.
- C. Dewater excavations to maintain dry conditions and preserve final grades at bottom of excavation.
- D. Provide sheeting and shoring in accordance with Section 31 23 17.

- E. Place bedding material at trench bottom, level continuous layer not exceeding 6-inch compacted depth; compact to 95 percent per Section 31 23 17.

3.3 INSTALLATION – PIPE

- A. Gravity sewer pipe installation must comply with ANSI / ASTM D2322-74 as the minimum acceptable standards as well as any additional requirements as stated herein.
- B. Pipe shall be laid in a full bed of crushed stone (ASTM C33, No. 57 Stone) or fine granulated material specified in section 2.6
- C. Install in accordance with manufactures instructions and as indicated on Drawings.
- D. Install plastic pipe, fittings, and accessories in accordance with ASTM D2321.
- E. Install VCP, fittings, and accessories in accordance with ASTM C12.
- F. Install RCP, fittings, and accessories in accordance with ASTM C1479.
- G. Install CIP and DIP, fittings, and accessories in accordance with applicable portions of AWWA C600.
- H. Seal joints watertight.
- I. Lay pipe to slope gradients indicated on Drawings with maximum variation from indicated slope of 1/8 inch in 10 feet. Begin at downstream end and progress upstream.
- J. Ensure entire pipe is supported by bedding.
- K. Assemble and handle pipe in accordance with manufacturer’s instructions except as modified on the Drawings or by Engineer.
- L. Keep pipe and fittings clean until work is completed and accepted by Engineer. Cap open ends during periods of work stoppage.
- M. Lay bell and spigot pipe with bells upstream.
- N. Connect pipe to existing sewer system as indicated on Drawings at existing manhole or using doghouse manhole connection.
- O. Place haunching material, rod, and tamp per Section 31 23 17 to eliminate voids.
- P. Install underground marking tape continuously 12 inches below ground surface.

3.4 CONNECTION TO EXISTING MANHOLE / SYSTEM

- A. Connections to existing manholes shall be made in the presence of the Department. The contractor shall notify the Department 48 hours before starting a connection. All new holes in existing manholes shall be core drilled.

- B. Core drill existing manhole to clean opening. Using pneumatic hammers, chipping guns, and sledge hammers is not permitted.
- C. Install watertight neoprene gasket and seal with non-shrink concrete grout.
- D. Concrete encase new sewer pipe minimum of 24 inches to nearest pipe joint. Use epoxy binder between new and existing concrete.
- E. Prevent construction debris from entering existing sewer line when making connection.
- F. Doghouse Manhole – Construct new manhole over existing gravity main breaking upper half of existing pipe after base of manhole is completed so as not to obstruct flow of existing pipe.

3.5 MANHOLE INSTALLATION

- A. Install manholes in accordance with Section 33 05 13.16.

3.6 INSTALLATION - WYE BRANCHES AND TEES

- A. Install wye branches or pipe tees at locations indicated on Drawings concurrent with pipe laying operations. Use standard fittings of same material and joint type as sewer main.
- B. Maintain minimum 5 feet separation distance between wye connection and manhole.
- C. Use saddle wye or tee with stainless steel clamps for taps into existing piping. Mount saddles with solvent cement or gasket and secure with metal bands. Layout holes with template and cut holes with mechanical cutter.

3.7 INSTALLATION - SANITARY LATERALS

- A. Construct laterals from wye branch to terminal point at right-of-way or as indicated on Drawings.
- B. Where depth of main pipeline warrants, construct riser type laterals from wye branch.
- C. Maintain 3-foot minimum depth of cover over pipe.
- D. Maintain minimum 5-foot separation distance between laterals.
- E. Install watertight plug, braced to withstand pipeline test pressure thrust, at termination of lateral. Install temporary marker stake extending from end of lateral to 24 inches above finished grade. Paint top 6 inches of stake with fluorescent orange paint.

3.8 BACKFILLING

- A. Backfill around sides and to top of pipe in accordance with Section 31 23 17.
- B. Maintain optimum moisture content of backfill material to attain required compaction density.

3.9 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Request inspection prior to and immediately after placing bedding.
- C. All gravity sewer manholes and pipelines shall be visually inspected by the Department's inspection prior to acceptance. Gravity sewer manholes shall be to final grade, have not visible infiltration, contain properly formed and sloped inverts, and be properly coated as outlined in previous sections. Gravity sewer pipelines shall be of uniform slope with no portion holding water. Repairs to gravity sewer pipelines shall be performed in a manner equivalent to new construction. Fernco style couplings or repair bands shall not be used.
- D. Perform test on sanitary sewage system in accordance with Section 33 01 32 and Dorchester County Requirements found in the "*Minimum Standards for the Design and Construction of Water and Sanitary Sewer Systems.*"
- E. Compaction Testing: In accordance with Section 31 23 17.
- F. When tests indicate Work does not meet specified requirements, remove work, replace, and retest.

3.10 PROTECTION OF FINISHED WORK

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

END OF SECTION

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SECTION 33 34 00
SANITARY UTILITY SEWERAGE FORCE MAINS

PART 1 GENERAL

**All Materials & Construction to conform to Dorchester County Water & Sewer Department's
"Minimum Standards for the Design and Construction of Water and Sanitary Sewer Systems"**

1.1 SUMMARY

- A. Section Includes:
 - 1. Force mains.
 - 2. Bedding materials.
 - 3. Testing Procedures.

- B. Related Sections:
 - 1. Section 31 23 17 - Trenching: Excavation and backfill requirements.
 - 2. Section 33 05 13.16 - Utility Manholes and Structures: Manholes vaults.
 - 3. Section 33 05 19 - Pressure Piping Tied Joint Restraint Systems.
 - 4. Section 33 05 23 - Trenchless Utility Installation: Pipe installation under roadways and other obstructions.
 - 5. Section 33 01 32 - Sewer and Manhole Testing.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
 - 2. ASTM D2241 - Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
 - 3. ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
 - 4. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

- B. American Water Works Association:
 - 1. AWWA C104 - ANSI Standard for Cement Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
 - 2. AWWA C105 - ANSI Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems.
 - 3. AWWA C110 - ANSI Standard for Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (76 mm through 1,219 mm), for Water.
 - 4. AWWA C111 - ANSI Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
 - 5. AWWA C151 - ANSI Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.
 - 6. AWWA C153 - ANSI Standard for Ductile-Iron Compact Fittings for Water Service.

7. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
8. AWWA C605 - Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings.
9. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4 In. Through 12 In. (100 mm through 300 mm), for Water Distribution.
10. AWWA C905 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In. Through 36 In. (350 mm Through 1,200 mm), for Water Transmission and Distribution.

C. SCDHEC Regulations:

1. R.61-67: Standards for Wastewater Facility Construction.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Shop Drawings: Indicate piping layout, including piping specialties.
- C. Product Data: Submit data on pipe materials, pipe fittings, valves, and accessories.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record location of pipe runs, connections, and invert elevations.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance SCDOT Standard Specifications except as modified herein.
- B. Perform work in accordance with utility company standards.
- C. Maintain one copy of each document on site.

1.6 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this Section.

1.7 FIELD MEASUREMENTS

- A. Verify field measurements and elevations are as indicated on Drawings.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Do not place materials on private property without written permission of property owner.
- B. During loading, transporting and unloading, exercise care to prevent damage to materials.
- C. Do not drop pipe or fittings.
- D. Avoid shock or damage to pipe.
- E. Take measures to prevent damage to exterior surface or internal lining of pipe.
- F. Do not stack pipe higher than recommended by pipe manufacturer.
- G. Store gaskets for mechanical and push-on joints in cool, dry location out of direct sunlight and not in contact with petroleum products.

1.9 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate the Work with connection to existing municipal sewer utility service and trenching.

PART 2 PRODUCTS

2.1 FORCE MAIN PIPING

- A. Ductile Iron Pipe: AWWA C151. Bituminous outside coating: AWWA C151.
 - 1. Pipe Pressure Class: 350 psi.
 - 2. Fittings: Ductile iron, standard size, AWWA C110; compact size, AWWA C153.
 - a. Coating: Bituminous Coating, AWWA C110.
 - b. Pressure Rating: 150 psi.
 - c. Lining: Amine cured Novalac Epoxy polymeric lining, 40 mils nominal thickness. Protecto 401 by Vulcan Painters, Birmingham, Alabama, 40 mils nominal thickness
 - 3. Joints:
 - a. Mechanical Joints: AWWA C111.
 - b. Push-On Joints: AWWA C111.
 - c. Flanged Joints inside structures: AWWA C115.
 - 4. Lining: Amine cured Novalac Epoxy containing a minimum of 20% by volume ceramic pigmentation. PermoX-CTF by Permite Corp., Stone Mountain, GA, 40 mils nominal thickness. Contractor to follow

- B. Polyvinyl Chloride (PVC): AWWA C900, marked for Sanitary Service, colored green.
 - 1. Pipe Class: DR 25, 165 psi
 - 2. Fittings: Ductile iron, standard size, AWWA C110; compact size, AWWA C153
 - a. Pressure Rating: 150 psi
 - b. Lining: Same as Ductile Iron Pipe above.
 - 3. Joints:
 - a. Use integral bell or coupling type with elastomeric gaskets.
 - b. Push on PVC, ASTM D3139 with ASTM F477 flexible elastomeric seals
 - c. Ductile Iron, Mechanical Joint, AWWA C111 (class 52) – full length

2.2 AIR RELEASE VALVES

- A. Manufacturers:
 - 1. H-TEC Model # 968
 - 2. Or Equal per Engineer.
- B. Furnish materials in accordance with utility company or governing agency requirements.
 - 1. See Section **14.D** of Dorchester County Water & Sewer Department’s “Minimum Standards for the Design and Construction of Water and Sanitary Sewer Systems” for specific requirements.
 - 2. Single body universal type with compound lever system.
 - 3. Internal linkage and float of stainless steel.
 - 4. Capacity: at 10 lbs. working pressure, vent not less than 25 cfm of free air.
 - 5. Provide the following:
 - a. 2” inlet.
 - b. 2” stainless steel T-handle ball valve.
 - c. 1” blowoff stainless steel T-handle ball valve.
 - d. Quick disconnect couplings.
 - e. Back flushing hose.
 - f. “Protectop” cover.
 - g. Piping, nipples, plugs, etc.: Schedule 40, type 316 stainless steel.
- C. Contractor to field verify high point for location of air release valves.
- D. Contractor is responsible for adding air release valves at any unplanned high points at no cost to the County.

2.3 UNDERGROUND PIPE MARKERS

- A. Plastic Ribbon Tape and Trace Wire:
 - 1. All DIP, PVC, & house sewer installations shall include the installation of an electronically or magnetically detectable safety tape buried directly over the pipe 12” below the ground surface continuously. The tape shall be at least 2” wide, be green on top, and be boldly labeled every 18” to 32” as follows “CAUTION SEWER LINE BURED BELOW”. The tape shall have a tensile strength of not less than 4000 psi, a dart impact strength of not less than 120 grams per 1. Mils, be not less than 0.0055” thick, and include sufficient metal to allow easy detection at the above stated depths.
 - 2. ALL DIP, PVC, & house sewer installations shall also include the installation of metallic tracer wire laid 6” above the pipe.

2.4 CONCRETE FOR THRUST RESTRAINT AND COLLARS

- A. Concrete thrust block blocking **not** to be used; except on a case-by-case basis as approved by the Dorchester County Water and Sewer Department and engineer.
- B. Concrete: Concrete conforming to Divisions 500 and 700 of the SCDOT Standard Specifications.
 - 1. Compressive strength of 3,000 psi at 28 days.
 - 2. Air entrained.
 - 3. Water cement ratio of 0.488 with rounded aggregate and 0.567 with angular aggregate.
 - 4. Maximum slump of 3.5 inch for vibrated concrete and 4 inch for non-vibrated concrete.
 - 5. Minimum cement content of 564 pounds per cubic yard for vibrated and 602 pounds per cubic yard for non-vibrated concrete.

2.5 BEDDING AND COVER MATERIALS

- A. Bedding for Rigid Pipe (DIP, PVC C900, PVC C905):
 - 1. Class B (Type 2) Foundation Stone: Clean course aggregate Gradation No. 57 conforming to Sections 801 of the SCDOT Standard Specifications.
 - 2. In lieu of Class B (Type 2) bedding, fine granular fill may be used from the excavation provided that the trench is dewatered prior to excavation and a dry trench is maintained until the pipeline is completely backfilled.
- B. Bedding for Flexible Pipe (PVC, ABS): Clean course aggregate Gradation No. 57 conforming to Division 700 of the SCDOT Standard Specifications.
- C. Backfill around Pipe and Above Pipe: As specified in Section 31 23 17 -Trenching.

2.6 ACCESSORIES

- A. Steel Rods, Bolt, Lugs, and Brackets: ASTM A36/A36M or ASTM A307 carbon steel.

PART 3 EXECUTION

3.1 PREPARATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify existing sewer connection, size, location, and inverts are as indicated on Drawings.

3.2 EXCAVATION

- A. Excavate pipe trench in accordance with Section 31 23 17 for Work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated on Drawings.
- B. Dewater excavations to maintain dry conditions and preserve final grades at bottom of excavation.
- C. Provide sheeting and shoring as required.
- D. Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 6 inches in compacted depth; compact to 95 percent.

3.3 INSTALLATION – PIPE

- A. Install ductile iron pipe and fittings in accordance with AWWA C600 and manufactures' instructions.
- B. Install PVC pipe in accordance with AWWA C605 and manufactures' instructions.
- C. Handle and assemble pipe in accordance with manufacturer's instructions and as indicated on Drawings.
- D. Steel Rods, Bolt, Lugs, and Brackets: Coat buried steel with one coat of coal tar coating before backfilling.
- E. Maintain minimum 10-foot horizontal separation and 18-inch vertical separation of water main from sewer piping or as required by local code.
- F. Install pipe to indicated elevation on the plans, avoiding excessive high points in the force main. Contractor to field verify high points for location of air release valves.
- G. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs. Use only equipment specifically designed for pipe cutting. The use of chisels or hand saws will not be permitted. Grind edges smooth with beveled end for push-on connections.
- H. Remove scale and dirt on inside and outside before assembly.
- I. Route pipe in straight line. Relay pipe that is out of alignment or grade.
- J. Install pipe with no high points unless indicated on Drawings. If unforeseen field conditions arise which necessitate high points, install air release valves as directed by Dorchester County and the Engineer.
- K. Install pipe to have bearing along entire length of pipe. Excavate bell holes to permit proper joint installation. Do not lay pipe in wet or frozen trench.
- L. Prevent foreign material from entering pipe during placement.
- M. Install pipe to allow for expansion and contraction without stressing pipe or joints.

- N. Close pipe openings with watertight plugs during work stoppages.
- O. Install underground marking tape continuously 12 inches below finished grade directly over the pipe.
- P. Install Metallic Tracer Wire continuously 6 inches above the pipe.
- Q. Establish elevations of buried piping with not less than 3.5 feet of cover. Measure depth of cover from final surface grade to top of pipe barrel.

3.4 CONCRETE THRUST RESTRAINT

- A. Concrete thrust block blocking **not** to be used; except on a case-by-case basis as approved by the Dorchester County Water and Sewer Department and engineer.
- B. Pour concrete thrust blocks against undisturbed earth. Locate thrust blocks at each elbow or change of pipe direction to resist resultant force and so pipe and fitting joints will be accessible for repair.
- C. Do not encase fitting joints and flanges.

3.5 BACKFILLING

- A. Backfill and compact around sides and to top of pipe in accordance with Section 31 23 17.
- B. Maintain optimum moisture content of material to attain required compaction density.

3.6 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Perform soil compaction tests in accordance with Section 31 23 17.
- C. Dorchester County W&S Department will require that all sanitary sewer systems pass the following test prior to acceptance. The department shall be notified 72 hours before inspections.
 - 1. Soil Compaction Test – All Trenches suspected of not meeting the compaction requirements within Section 31 23 17 shall be tested for conformance by a Department approved testing lab and at the locations and depths requested by the department.
 - 2. Pressure Test – Perform pressure test on sanitary sewer force mains in accordance with AWWA C600.
 - a. Notify Engineer & Owner 72 hours in advance of test.

- b. After completion of pipeline installation, including backfill, but prior to final connection to existing system, conduct concurrent hydrostatic pressure and leakage tests in accordance with AWWA C600
- c. Provide equipment required to perform leakage and hydrostatic pressure tests.
- d. Test Pressure: 1.5 x working pressure (Not less than 100 psi.)
- e. Conduct hydrostatic test for at least a **two**-hour duration.
- f. Typically No pipeline installation will be approved when pressure varies by more than 5 psi at completion of hydrostatic pressure test.
- g. Before applying test pressure, completely expel air from section of piping under test. Provide corporation cocks so air can be expelled as pipeline is filled with water. After air has been expelled, close corporation cocks and apply test pressure. At conclusion of tests, remove corporation cocks removed and plug resulting piping openings.
- h. Slowly bring piping to test pressure and allow system to stabilize prior to conducting leakage test. Do not open or close valves at differential pressures above rated pressure.
- i. Examine exposed piping, fittings, valves, and joints carefully during hydrostatic pressure test. Repair or replace damage or defective pipe, fittings, valves, or joints discovered, following pressure test.
- j. **Typically the Department will not allow any measurable leakage for wastewater force mains.** No pipeline installation will be approved when leakage is greater than that determined by the following AWWA formula:

$L = (SD\sqrt{P})/133,200$
L = allowable, in gallons per hour
S = length of pipe tested, in inches
D = nominal diameter of pipe, in inches
P = average test pressure during leakage test, in pounds per square inch (gauge)

- k. When leakage exceeds specified acceptable rate, locate source and make repairs. Repeat test until specified leakage requirements are met.
- l. Contractor shall pay for additional testing cost associated with retesting of the mains.

END OF SECTION

**Attachment C – Norfolk Southern- Special Provisions for Protection of
Railway Interests**

E. Norfolk Southern – Special Provisions for Protection of Railway Interests

1. AUTHORITY OF RAILROAD ENGINEER AND SPONSOR ENGINEER:

Norfolk Southern Railway Company, hereinafter referred to as “Railroad”, and their authorized representative shall have final authority in all matters affecting the safe maintenance of railroad traffic including the adequacy of the foundations and structures supporting the railroad tracks. For Public Projects impacting the Railroad, the Railroad’s Public Projects Engineer, hereinafter referred to as “Railroad Engineer”, will serve as the authorized representative of the Railroad.

The authorized representative of the Project Sponsor (“Sponsor”), hereinafter referred to as the “Sponsor’s Engineer”, shall have authority over all other matters as prescribed herein and in the Project Specifications.

The Sponsor’s Prime Contractor, hereinafter referred to as “Contractor” shall be responsible for completing any and all work in accordance with the terms prescribed herein and in the Project Specifications. These terms and conditions are subject to change without notice, from time to time in the sole discretion of the Railroad. Contractor must request from Railroad and follow the latest version of these provisions prior to commencing work.

2. NOTICE OF STARTING WORK:

- A. The Contractor shall not commence any work on railroad rights-of-way until he has complied with the following conditions:
 1. Signed and received a fully executed copy of the required Norfolk Southern Contractor Right of Entry Agreement.
 2. Given the Railroad written notice in electronic format to the Railroad Engineer, with copy to the Sponsor’s Engineer who has been designated to be in charge of the work, at least ten days in advance of the date he proposes to begin work on Railroad rights-of-way.
 3. Obtained written approval from the Railroad of Railroad Protective Liability Insurance coverage as required by paragraph 14 herein. It should be noted that the Railroad does not accept notation of Railroad Protective insurance on a certificate of liability insurance form or Binders as Railroad must have the full original countersigned policy. Further, please note that mere receipt of the policy is not the only issue but review for compliance. Due to the number of projects system-wide, it typically takes a minimum of 30-45 days for the Railroad to review.
 4. Obtained Railroad’s Flagging Services as required by paragraph 7 herein.
 5. Obtained written authorization from the Railroad to begin work on Railroad’s rights-of-way, such authorization to include an outline of specific conditions with which he must comply.
 6. Furnished a schedule for all work within the Railroad’s rights-of-way as required by paragraph 7.B.1.

- B. The Railroad's written authorization to proceed with the work shall include the names, addresses, and telephone numbers of the Railroad's representatives who are to be notified as hereinafter required. Where more than one representative is designated, the area of responsibility of each representative shall be specified.

3. INTERFERENCE WITH RAILROAD OPERATIONS:

- A. The Contractor shall so arrange and conduct his work that there will be no interference with Railroad's operations, including train, signal, telephone and telegraphic services, or damage to the property of the Railroad or to poles, wires, and other facilities of tenants on the rights-of-way of the Railroad. Whenever work is liable to affect the operations or safety of trains, the method of doing such work shall first be submitted to the Railroad Engineer for approval, but such approval shall not relieve the Contractor from liability. Any work to be performed by the Contractor which requires flagging service or inspection service shall be deferred by the Contractor until the flagging service or inspection service required by the Railroad is available at the job site.
- B. Whenever work within Railroad's rights-of-way is of such a nature that impediment to Railroad's operations such as use of runaround tracks or necessity for reduced speed is unavoidable, the Contractor shall schedule and conduct his operations so that such impediment is reduced to the absolute minimum.
- C. Should conditions arising from, or in connection with the work, require that immediate and unusual provisions be made to protect operations and property of the Railroad, the Contractor shall make such provisions. If in the judgment of the Railroad Engineer, or in his absence, the Railroad's Division Engineer, such provisions is insufficient, either may require or provide such provisions as he deems necessary. In any event, such unusual provisions shall be at the Contractor's expense and without cost to the Railroad or the Sponsor.
- D. "One Call" Services do not locate buried Railroad utilities. The contractor shall contact the Railroad's representative 2 days in advance of work at those places where excavation, pile driving, or heavy loads may damage the Railroad's underground facilities. Upon request from the Contractor or Sponsor, Railroad forces will locate and paint mark or flag the Railroad's underground facilities. The Contractor shall avoid excavation or other disturbances of these facilities. If disturbance or excavation is required near a buried Railroad facility, the contractor shall coordinate with the Railroad to have the facility potholed manually with careful hand excavation. The facility shall be protected by the Contractor during the course of the disturbance under the supervision and direction of the Railroad's representative.

4. TRACK CLEARANCES:

- A. The minimum track clearances to be maintained by the Contractor during construction are shown on the Project Plans. If temporary clearances are not shown on the project plans, the following criteria shall govern the use of falsework and formwork above or adjacent to operated tracks.
 - 1. A minimum vertical clearance of 22'-0" above top of highest rail shall be maintained at all times.
 - 2. A minimum horizontal clearance of 13'-0" from centerline of tangent track or 14'-0" from centerline of curved track shall be maintained at all times. Additional horizontal

clearance may be required in special cases to be safe for operating conditions. This additional clearance will be as determined by the Railroad Engineer.

3. All proposed temporary clearances which are less than those listed above must be submitted to Railroad Engineer for approval prior to construction and must also be authorized by the regulatory body of the State if less than the legally prescribed clearances.
 4. The temporary clearance requirements noted above shall also apply to all other physical obstructions including, but not limited to: stockpiled materials, parked equipment, placement or driving of piles, and bracing or other construction supports.
- B. Before undertaking any work within Railroad right-of-way, and before placing any obstruction over any track, the Contractor shall:
1. Notify the Railroad's representative at least 72 hours in advance of the work.
 2. Receive assurance from the Railroad's representative that arrangements have been made for flagging service as may be necessary.
 3. Receive permission from the Railroad's representative to proceed with the work.
 4. Ascertain that the Sponsor's Engineer has received copies of notice to the Railroad and of the Railroad's response thereto.

5. CONSTRUCTION PROCEDURES:

A. General:

1. Construction work and operations by the Contractor on Railroad property shall be:
 - a. Subject to the inspection and approval of the Railroad Engineer or their designated Construction Engineering Representative.
 - b. In accordance with the Railroad's written outline of specific conditions.
 - c. In accordance with the Railroad's general rules, regulations and requirements including those relating to safety, fall protection and personal protective equipment.
 - d. In accordance with these Special Provisions.
2. Submittal Requirements
 - a. The Contractor shall submit all construction related correspondence and submittals electronically to the Railroad Engineer.
 - b. The Contractor shall allow for 30 days for the Railroad's review and response.
 - c. All work in the vicinity of the Railroad's property that has the potential to affect the Railroad's train operations or disturb the Railroad's Property must be submitted and approved by the Railroad prior to work being performed.

- d. All submittals and calculations must be signed and sealed by a registered engineer licensed in the state of the project work.
- e. All submittals shall first be approved by the Sponsor's Engineer and the Railroad Engineer, but such approval shall not relieve the Contractor from liability.
- f. For all construction projects, the following submittals, but not limited to those listed below, shall be provided for review and approval when applicable:
 - (1) General Means and Methods
 - (2) Ballast Protection
 - (3) Construction Excavation & Shoring
 - (4) Pipe, Culvert, & Tunnel Installations
 - (5) Demolition Procedure
 - (6) Erection & Hoisting Procedure
 - (7) Debris Shielding or Containment
 - (8) Blasting
 - (9) Formwork for the bridge deck, diaphragms, overhang brackets, and protective platforms
 - (10) Bent Cap Falsework. A lift plan will be required if the contractor want to move the falsework over the tracks.
- g. For Undergrade Bridges (Bridges carrying the Railroad) the following submittals in addition to those listed above shall be provided for review and approval:
 - (1) Shop Drawings
 - (2) Bearing Shop Drawings and Material Certifications
 - (3) Concrete Mix Design
 - (4) Structural Steel, Rebar, and/or Strand Certifications
 - (5) 28 day Cylinder Test for Concrete Strength
 - (6) Waterproofing Material Certification
 - (7) Test Reports for Fracture Critical Members
 - (8) Foundation Construction Reports

Fabrication may not begin until the Railroad has approved the required shop drawings.

- h. The Contractor shall include in all submissions a detailed narrative indicating the progression of work with the anticipated timeframe to complete each task. Work will not be permitted to commence until the Contractor has provided the Railroad with a satisfactory plan that the project will be undertaken without scheduling, performance or safety related issues. Submission shall also provide a listing of the anticipated equipment to be used, the location of all equipment to be used and insure a contingency plan of action is in place should a primary piece of equipment malfunction.

B. Ballast Protection

- 1. The Contractor shall submit the proposed ballast protection system detailing the specific filter fabric and anchorage system to be used during all construction activities.

2. The ballast protection is to extend 25' beyond the proposed limit of work, be installed at the start of the project and be continuously maintained to prevent all contaminants from entering the ballast section of all tracks for the entire duration of the project.
- C. Excavation:
1. The subgrade of an operated track shall be maintained with edge of berm at least 10'-0" from centerline of track and not more than 24-inches below top of rail. Contractor will not be required to make existing section meet this specification if substandard, in which case existing section will be maintained.
 2. Additionally, the Railroad will require the installation of an OSHA approved handrail and orange construction safety fencing for all excavations of the Railroad right-of-way.
- D. Excavation for Structures and Shoring Protection:
1. The Contractor will be required to take special precaution and care in connection with excavating and shoring pits, and in driving piles or sheeting for footings adjacent to tracks to provide adequate lateral support for the tracks and the loads which they carry, without disturbance of track alignment and surface, and to avoid obstructing track clearances with working equipment, tools or other material.
 2. All plans and calculations for shoring shall be prepared, signed, and sealed by a Registered Professional Engineer licensed in the state of the proposed project, in accordance with Norfolk Southern's Overhead Grade Separation Design Criteria, subsection H.1.6.E-Construction Excavation (Refer to Norfolk Southern Public Projects Manual Appendix H). The Registered Professional Engineer will be responsible for the accuracy for all controlling dimensions as well as the selection of soil design values which will accurately reflect the actual field conditions.
 3. The Contractor shall provide a detailed installation and removal plan of the shoring components. Any component that will be installed via the use of a crane or any other lifting device shall be subject to the guidelines outlined in section 5.G of these provisions.
 4. The Contractor shall be required to survey the track(s) and Railroad embankment and provide a cross section of the proposed excavation in relation to the tracks.
 5. Calculations for the proposed shoring should include deflection calculations. The maximum deflection for excavations within 18'-0" of the centerline of the nearest track shall be 3/8". For all other cases, the max deflection shall not exceed 1/2".
 6. Additionally, the Railroad will require the installation of an OSHA approved handrail and orange construction safety fencing for all excavations of the Railroad right-of-way.
 7. The front face of shoring located to the closest NS track for all shoring set-ups located in Zone 2 as shown on NS Typical Drawing No. 4 – Shoring Requirements (Appendix I) shall remain in place and be cut off 2'-0" below the final ground elevation. The remaining shoring in Zone 2 and all shoring in Zone 1 may be removed and all voids must be backfilled with flowable fill.

E. Pipe, Culvert, & Tunnel Installations

1. Pipe, Culvert, & Tunnel Installations shall be in accordance with the appropriate Norfolk Southern Design Specification as noted below:
 - a. For Open Cut Method refer to Norfolk Southern Public Projects Manual Appendix H.4.6.
 - b. For Jack and Bore Method refer to Norfolk Southern Public Projects Manual Appendix H.4.7.
 - c. For Tunneling Method refer to Norfolk Southern Public Projects Manual Appendix H.4.8.
2. The installation methods provided are for pipes carrying storm water or open flow run-off. All other closed pipeline systems shall be installed in accordance Norfolk Southern's Pipe and Wire Program and the NSCE-8

F. Demolition Procedures

1. General
 - a. Demolition plans are required for all spans over the track(s), for all spans adjacent to the track(s), if located on (or partially on) Railroad right-of-way; and in all situations where cranes will be situated on, over, or adjacent to Railroad right-of-way and within a distance of the boom length plus 15'-0" from the centerline of track.
 - b. Railroad tracks and other Railroad property must be protected from damage during the procedure.
 - c. A pre-demolition meeting shall be conducted with the Sponsor, the Railroad Engineer or their representative, and the key Contractor's personnel prior to the start of the demolition procedure.
 - d. The Railroad Engineer or his designated representative must be present at the site during the entire demolition procedure period.
 - e. Existing, obsolete, bridge piers shall be removed to a sufficient depth below grade to enable restoration of the existing/proposed track ditch, but in no case less than 2'-0" below final grade.
2. Submittal Requirements
 - a. In addition to the submittal requirements outlined in Section 5.A.2 of these provisions, the Contractor shall submit the following for approval by the Railroad Engineer:
 - (1) A plan showing the location of cranes, horizontally and vertically, operating radii, with delivery or disposal locations shown. The location of all tracks and other Railroad facilities as well as all obstructions such as wire lines, poles, adjacent structures, etc. must also be shown.

- (2) Rating sheets showing cranes or lifting devices to be adequate for 150% of the actual weight of the pick, including all rigging components. A complete set of crane charts, including crane, counterweight, and boom nomenclature is to be submitted. Safety factors that may have been “built-in” to the crane charts are not to be considered when determining the 150% factor of safety.
- (3) Plans and computations showing the weight of the pick must be submitted. Calculations shall be made from plans of the existing structure showing complete and sufficient details with supporting data for the demolition the structure. If plans do not exist, lifting weights must be calculated from field measurements. The field measurements are to be made under the supervision of the Registered Professional Engineer submitting the procedure and calculations.
- (4) The Contractor shall provide a sketch of all rigging components from the crane’s hook block to the beam. Catalog cuts or information sheets of all rigging components with their lifting capacities shall be provided. All rigging must be adequate for 150% of the actual weight of the pick. Safety factors that may have been “built-in” to the rating charts are not to be considered when determining the 150% factor of safety. All rigging components shall be clearly identified and tagged with their rated lifting capacities. The position of the rigging in the field shall not differ from what is shown on the final plan without prior review from the Sponsor and the Railroad.
- (5) A complete demolition procedure, including the order of lifts, time required for each lift, and any repositioning or re-hitching of the crane or cranes.
- (6) Design and supporting calculations for the temporary support of components, including but not limited to the stability of the superstructure during the temporary condition, temporary girder tie-downs and falsework.

3. Overhead Demolition Debris Shield

- a. The demolition debris shield shall be installed prior to the demolition of the bridge deck or other relevant portions of the superstructure over the track area to catch all falling debris.
- b. The demolition debris shield shall provide a minimum vertical clearance as specified in Section 4.A.1 of these provisions or maintain the existing vertical clearance if the existing clearance is less than that specified in Section 4.A.1.
- c. The Contractor shall include the demolition debris shield installation/removal means and methods as part of the proposed Demolition procedure submission.
- d. The Contractor shall submit the demolition debris shield design and supporting calculations for approval by the Railroad Engineer.

- e. The demolition debris shield shall have a minimum design load of 50 pounds per square foot plus the weight of the equipment, debris, personnel, and other loads to be carried.
- f. The Contractor shall include the proposed bridge deck removal procedure in its demolition means and methods and shall verify that the size and quantity of the demolition debris generated by the procedure does not exceed the shield design loads.
- g. The Contractor shall clean the demolition debris shield daily or more frequently as dictated either by the approved design parameters or as directed by the Railroad Engineer.

4. Vertical Demolition Debris Shield

- a. A vertical demolition debris shield may be required for substructure removals in close proximity to the Railroad's track and other facilities, as determined by the Railroad Engineer.

G. Erection & Hoisting Procedures

1. General

- a. Erection plans are required for all spans over the track(s), for all spans adjacent to the track(s), if located on (or partially on) Railroad right-of-way; and in all situations where cranes will be situated on, over, or adjacent to Railroad right-of-way and within a distance of the boom length plus 15'-0" from the centerline of track.
- b. Railroad tracks and other Railroad property must be protected from damage during the erection procedure.
- c. A pre-erection meeting shall be conducted with the Sponsor, the Railroad Engineer or their representative, and the key Contractor's personnel prior to the start of the erection procedure.
- d. The Railroad Engineer or his designated representative must be present at the site during the entire erection procedure period.
- e. For field splices located over Railroad property, a minimum of 50% of the holes for each connection shall be filled with bolts or pins prior to releasing the crane. A minimum of 50% of the holes filled shall be filled with bolts. All bolts must be appropriately tightened. Any changes to previously approved field splice locations must be submitted to the Railroad for review and approval. Refer to Norfolk Southern's Overhead Grade Separation Design Criteria for additional splice details (Norfolk Southern Public Projects Manual Appendix H.1, Section 4.A.3.).

2. Submittal Requirements

- a. In addition the submittal requirements outlined in Section 5.A.2 of these provisions, the Contractor shall submit the following for approval by the Railroad Engineer:
- (1) As-built beam seat elevations - All as-built bridge seats and top of rail elevations shall be furnished to the Railroad Engineer for review and verification at least 30 days in advance of the erection, to ensure that minimum vertical clearances as approved in the plans will be achieved.
 - (2) A plan showing the location of cranes, horizontally and vertically, operating radii, with delivery or staging locations shown. The location of all tracks and other Railroad facilities as well as all obstructions such as wire lines, poles, adjacent structures, etc. must also be shown.
 - (3) Rating sheets showing cranes or lifting devices to be adequate for 150% of the actual weight of the pick, including all rigging components. A complete set of crane charts, including crane, counterweight, and boom nomenclature is to be submitted. Safety factors that may have been "built-in" to the crane charts are not to be considered when determining the 150% factor of safety.
 - (4) Plans and computations showing the weight of the pick must be submitted. Calculations shall be made from plans of the proposed structure showing complete and sufficient details with supporting data for the erection of the structure. If plans do not exist, lifting weights must be calculated from field measurements. The field measurements are to be made under the supervision of the Registered Professional Engineer submitting the procedure and calculations.
 - (5) The Contractor shall provide a sketch of all rigging components from the crane's hook block to the beam. Catalog cuts or information sheets of all rigging components with their lifting capacities shall be provided. All rigging must be adequate for 150% of the actual weight of the pick. Safety factors that may have been "built-in" to the rating charts are not to be considered when determining the 150% factor of safety. All rigging components shall be clearly identified and tagged with their rated lifting capacities. The position of the rigging in the field shall not differ from what is shown on the final plan without prior review from the Sponsor and the Railroad.
 - (6) A complete erection procedure, including the order of lifts, time required for each lift, and any repositioning or re-hitching of the crane or cranes.
 - (7) Design and supporting calculations for the temporary support of components, including but not limited to temporary girder tie-downs and falsework.

H. Blasting:

1. The Contractor shall obtain advance approval of the Railroad Engineer and the Sponsor Engineer for use of explosives on or adjacent to Railroad property. The request for permission to use explosives shall include a detailed blasting plan. If permission for use of explosives is granted, the Contractor will be required to comply with the following:
 - a. Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of the Contractor and a licensed blaster.
 - b. Electric detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way radios.
 - c. No blasting shall be done without the presence of the Railroad Engineer or his authorized representative. At least 72 hours advance notice to the person designated in the Railroad's notice of authorization to proceed (see paragraph 2.B) will be required to arrange for the presence of an authorized Railroad representative and such flagging as the Railroad may require.
 - d. Have at the job site adequate equipment, labor and materials and allow sufficient time to clean up debris resulting from the blasting without delay to trains, as well as correcting at his expense any track misalignment or other damage to Railroad property resulting from the blasting as directed by the Railway's authorized representative. If his actions result in delay of trains, the Contractor shall bear the entire cost thereof.
 - e. The blasting Contractor shall have a copy of the approved blasting plan on hand while on the site.
 - f. Explosive materials or loaded holes shall not be left unattended at the blast site.
 - g. A seismograph shall be placed on the track shoulder adjacent to each blast which will govern the peak particle velocity of two inches per second. Measurement shall also be taken on the ground adjacent to structures as designated by a qualified and independent blasting consultant. The Railroad reserves the option to direct the placement of additional seismographs at structures or other locations of concern, without regard to scaled distance.
 - h. After each blast, the blasting Contractor shall provide a copy of their drill log and blast report, which includes number of holes, depth of holes, number of decks, type and pounds of explosives used per deck.
 - i. The Railroad may require top of rail elevations and track centers taken before, during and after the blasting and excavation operation to check for any track misalignment resulting from the Contractor's activities.

2. The Railroad representative will:
 - a. Determine approximate location of trains and advise the Contractor the appropriate amount of time available for the blasting operation and clean up.
 - b. Have the authority to order discontinuance of blasting if, in his opinion, blasting is too hazardous or is not in accord with these special provisions.
3. The Contractor must hire, at no expense to the Railroad, a qualified and independent blasting consultant to oversee the use of explosives. The blasting consultant will:
 - a. Review the Contractor's proposed drilling and loading patterns, and with the blasting consultant's personnel and instruments, monitor the blasting operations.
 - b. Confirm that the minimum amounts of explosives are used to remove the rock.
 - c. Be empowered to intercede if he concludes that the Contractor's blasting operations are endangering the Railway.
 - d. Submit a letter acknowledging that he has been engaged to oversee the entire blasting operation and that he approves of the blasting plan.
 - e. Furnish copies of all vibration readings to the Railroad representative immediately after each blast. The representative will sign and date the seismograph tapes after each shot to verify the readings are for that specific shot.
 - f. Advise the Railroad representative as to the safety of the operation and notify him of any modifications to the blasting operation as the work progresses.
4. The request for permission to use explosives on the Railroad's Right-of-Way shall include a blasting proposal providing the following details:
 - a. A drawing which shows the proposed blasting area, location of nearest hole and distance to Railway structures, all with reference to the centerline of track.
 - b. Hole diameter.
 - c. Hole spacing and pattern.
 - d. Maximum depth of hole.
 - e. Maximum number of decks per hole.
 - f. Maximum pounds of explosives per hole.
 - g. Maximum pounds of explosives per delay.
 - h. Maximum number of holes per detonation.

- i. Type of detonator and explosives to be used. (Electronic detonating devices will not be permitted). Diameter of explosives if different from hole diameter.
- j. Approximate dates and time of day when the explosives are to be detonated.
- k. Type of flyrock protection.
- l. Type and patterns of audible warning and all clear signals to be used before and after each blast.
- m. A copy of the blasting license and qualifications of the person directly in charge of the blasting operation, including their name, address and telephone number.
- n. A copy of the Authority's permit granting permission to blast on the site.
- o. A letter from the blasting consultant acknowledging that he has been engaged to oversee the entire blasting operation and that he approves of the blasting plan.
- p. In addition to the insurance requirements outlined in Paragraph 14 of these Provisions, A certificate of insurance from the Contractor's insurer stating the amount of coverage for XCU (Explosive Collapse and Underground Hazard) insurance and that XCU Insurance is in force for this project.
- q. A copy of the borings and Geotechnical information or report.

I. Track Monitoring

- 1. At the direction of the Railroad Engineer, any activity that has the potential to disturb the Railroad track structure may require the Contractor to submit a detailed track monitoring program for approval by the Railroad Engineer.
- 2. The program shall specify the survey locations, the distance between the location points, and frequency of monitoring before, during, and after construction. Railroad reserves the right to modify the survey locations and monitoring frequency as necessary during the project.
- 3. The survey data shall be collected in accordance with the approved frequency and immediately furnished to the Railroad Engineer for analysis.
- 4. If any movement has occurred as determined by the Railroad Engineer, the Railroad will be immediately notified. Railroad, at its sole discretion, shall have the right to immediately require all Contractor operations to be ceased and determine what corrective action is required. Any corrective action required by the Railroad or performed by the Railroad including the monitoring of corrective action of the Contractor will be at project expense.

J. Maintenance of Railroad Facilities:

- 1. The Contractor will be required to maintain all ditches and drainage structures free of silt or other obstructions which may result from his operations and provide and maintain any erosion control measures as required. The Contractor will promptly

repair eroded areas within Railroad rights-of-way and repair any other damage to the property of the Railroad or its tenants.

2. If, in the course of construction, it may be necessary to block a ditch, pipe or other drainage facility, temporary pipes, ditches or other drainage facilities shall be installed to maintain adequate drainage, as approved by the Railroad Engineer. Upon completion of the work, the temporary facilities shall be removed and the permanent facilities restored.
3. All such maintenance and repair of damages due to the Contractor's operations shall be done at the Contractor's expense.

K. Storage of Materials and Equipment:

1. Materials and equipment shall not be stored where they will interfere with Railroad operations, nor on the rights-of-way of the Railroad without first having obtained permission from the Railroad Engineer, and such permission will be with the understanding that the Railroad will not be liable for damage to such material and equipment from any cause and that the Railroad Engineer may move or require the Contractor to move, at the Contractor's expense, such material and equipment.
2. All grading or construction machinery that is left parked near the track unattended by a watchman shall be effectively immobilized so that it cannot be moved by unauthorized persons. The Contractor shall protect, defend, indemnify and save Railroad, and any associated, controlled or affiliated corporation, harmless from and against all losses, costs, expenses, claim or liability for loss or damage to property or the loss of life or personal injury, arising out of or incident to the Contractor's failure to immobilize grading or construction machinery.

L. Cleanup:

1. Upon completion of the work, the Contractor shall remove from within the limits of the Railroad rights-of-way, all machinery, equipment, surplus materials, falsework, rubbish or temporary buildings of the Contractor, and leave said rights-of-way in a neat condition satisfactory to the Railroad Engineer or his authorized representative.

6. DAMAGES:

- A. The Contractor shall assume all liability for any and all damages to his work, employees, servants, equipment and materials caused by Railroad traffic.
- B. Any cost incurred by the Railroad for repairing damages to its property or to property of its tenants, caused by or resulting from the operations of the Contractor, shall be paid directly to the Railroad by the Contractor.

7. FLAGGING SERVICES:

A. Requirements:

1. Flagging services will not be provided until the Contractor's insurance has been reviewed & approved by the Railroad.

2. Under the terms of the agreement between the Sponsor and the Railroad, the Railroad has sole authority to determine the need for flagging required to protect its operations. In general, the requirements of such services will be whenever the Contractor's personnel or equipment are or are likely to be, working on the Railroad's right-of-way, or across, over, adjacent to, or under a track, or when such work has disturbed or is likely to disturb a Railroad structure or the Railroad roadbed or surface and alignment of any track to such extent that the movement of trains must be controlled by flagging.
3. Normally, the Railroad will assign one flagman to a project; but in some cases, more than one may be necessary, such as yard limits where three (3) flagmen may be required. However, if the Contractor works within distances that violate instructions given by the Railroad's authorized representative or performs work that has not been scheduled with the Railroad's authorized representative, a flagman or flagmen may be required full time until the project has been completed.
4. For Projects exceeding 30 days of construction, Contractor shall provide the flagmen a small work area with a desk/counter and chair within the field/site trailer, including the use of bathroom facilities, where the flagman can check in/out with the Project, as well as to the flagman's home terminal. The work area should provide access to two (2) electrical outlets for recharging radio(s), and a laptop computer; and have the ability to print off needed documentation and orders as needed at the field/site trailer. This should aid in maximizing the flagman's time and efficiency on the Project.

B. Scheduling and Notification:

1. The Contractor's work requiring Railroad flagging should be scheduled to limit the presence of a flagman at the site to a maximum of 50 hours per week. The Contractor shall receive Railroad approval of work schedules requiring a flagman's presence in excess of 40 hours per week.
2. Not later than the time that approval is initially requested to begin work on Railroad right-of-way, Contractor shall furnish to the Railroad and the Sponsor a schedule for all work required to complete the portion of the project within Railroad right-of-way and arrange for a job site meeting between the Contractor, the Sponsor, and the Railroad's authorized representative. Flagman or Flagmen may not be provided until the job site meeting has been conducted and the Contractor's work scheduled.
3. The Contractor will be required to give the Railroad representative at least 10 working days of advance written notice of intent to begin work within Railroad right-of-way in accordance with this special provision. Once begun, when such work is then suspended at any time, or for any reason, the Contractor will be required to give the Railroad representative at least 3 working days of advance notice before resuming work on Railroad right-of-way. Such notices shall include sufficient details of the proposed work to enable the Railroad representative to determine if flagging will be required. If such notice is in writing, the Contractor shall furnish the Engineer a copy; if notice is given verbally, it shall be confirmed in writing with copy to the Engineer. If flagging is required, no work shall be undertaken until the flagman, or flagmen are present at the job site. It may take up to 30 days to obtain flagging initially from the Railroad. When flagging begins, the flagman is usually assigned by the Railroad to work at the project site on a continual basis until no longer

needed and cannot be called for on a spot basis. If flagging becomes unnecessary and is suspended, it may take up to 30 days to again obtain from the Railroad. Due to Railroad labor agreements, it is necessary to give 5 working days notice before flagging service may be discontinued and responsibility for payment stopped.

4. If, after the flagman is assigned to the project site, an emergency arises that requires the flagman's presence elsewhere, then the Contractor shall delay work on Railroad right-of-way until such time as the flagman is again available. Any additional costs resulting from such delay shall be borne by the Contractor and not the Sponsor or Railroad.

C. Payment:

1. The Sponsor will be responsible for paying the Railroad directly for any and all costs of flagging which may be required to accomplish the construction.
2. The estimated cost of flagging is the current rate per day based on a 10-hour work day. This cost includes the base pay for the flagman, overhead, and includes a per diem charge for travel expenses, meals and lodging. The charge to the Sponsor by the Railroad will be the actual cost based on the rate of pay for the Railroad's employees who are available for flagging service at the time the service is required.
3. Work by a flagman in excess of 8 hours per day or 40 hours per week, but not more than 12 hours a day will result in overtime pay at 1 and 1/2 times the appropriate rate. Work by a flagman in excess of 12 hours per day will result in overtime at 2 times the appropriate rate. If work is performed on a holiday, the flagging rate is 2 and 1/2 times the normal rate.
4. Railroad work involved in preparing and handling bills will also be charged to the Sponsor. Charges to the Sponsor by the Railroad shall be in accordance with applicable provisions of Subchapter B, Part 140, Subpart I and Subchapter G, Part 646, Subpart B of the Federal-Aid Policy Guide issued by the Federal Highway Administration on December 9, 1991, including all current amendments. Flagging costs are subject to change. The above estimates of flagging costs are provided for information only and are not binding in any way.

D. Verification:

1. Railroad's flagman will electronically enter flagging time via Railroad's electronic billing system. Any complaints concerning flagging must be resolved in a timely manner. If the need for flagging is questioned, please contact the Railroad Engineer. All verbal complaints will be confirmed in writing by the Contractor within 5 working days with a copy to the Sponsor's Engineer. Address all written correspondence electronically to Railroad Engineer.
2. The Railroad flagman assigned to the project will be responsible for notifying the Sponsor Engineer upon arrival at the job site on the first day (or as soon thereafter as possible) that flagging services begin and on the last day that he performs such services for each separate period that services are provided. The Sponsor's Engineer will document such notification in the project records. When requested, the Sponsor's Engineer will also sign the flagman's diary showing daily time spent and activity at the project site.

8. HAUL ACROSS RAILROAD TRACK:

- A. Where the plans show or imply that materials of any nature must be hauled across Railroad's track, unless the plans clearly show that the Sponsor has included arrangements for such haul in its agreement with the Railroad, the Contractor will be required to make all necessary arrangements with the Railroad regarding means of transporting such materials across the Railroad's track. The Contractor or Sponsor will be required to bear all costs incidental to such crossings whether services are performed by his own forces or by Railroad personnel.
- B. No crossing may be established for use of the Contractor for transporting materials or equipment across the tracks of the Railroad unless specific authority for its installation, maintenance, necessary watching and flagging thereof and removal, until a temporary private crossing agreement has been executed between the Contractor and Railroad. The approval process for an agreement normally takes 90 days.

9. WORK FOR THE BENEFIT OF THE CONTRACTOR:

- A. All temporary or permanent changes in wire lines or other facilities which are considered necessary to the project are shown on the plans; included in the force account agreement between the Sponsor and the Railroad or will be covered by appropriate revisions to same which will be initiated and approved by the Sponsor and/or the Railroad.
- B. Should the Contractor desire any changes in addition to the above, then he shall make separate arrangements with the Railroad for same to be accomplished at the Contractor's expense.

10. COOPERATION AND DELAYS:

- A. It shall be the Contractor's responsibility to arrange a schedule with the Railroad for accomplishing stage construction involving work by the Railroad or tenants of the Railroad. In arranging his schedule he shall ascertain, from the Railroad, the lead time required for assembling crews and materials and shall make due allowance therefore.
- B. No charge or claim of the Contractor against either the Sponsor or the Railroad will be allowed for hindrance or delay on account of railroad traffic; any work done by the Railroad or other delay incident to or necessary for safe maintenance of railroad traffic or for any delays due to compliance with these special provisions.

11. TRAINMAN'S WALKWAYS:

- A. Along the outer side of each exterior track of multiple operated track, and on each side of single operated track, an unobstructed continuous space suitable for trainman's use in walking along trains, extending to a line not less than 10 feet from centerline of track, shall be maintained. Any temporary impediments to walkways and track drainage encroachments or obstructions allowed during work hours while Railroad's protective service is provided shall be removed before the close of each work day. If there is any excavation near the walkway, a handrail, with 10'-0" minimum clearance from centerline of track, shall be placed and must conform to AREMA and/or FRA standards.

12. GUIDELINES FOR PERSONNEL ON RAILROAD RIGHT-OF-WAY:

- A. The Contractor and/or the Sponsor's personnel authorized to perform work on Railroad's property as specified in Section 2 above are not required to complete Norfolk Southern Roadway

Worker Protection Training; However the Contractor and the Sponsor's personnel must be familiar with Norfolk Southern's standard operating rules and guidelines, should conduct themselves accordingly, and may be removed from the property for failure to follow these guidelines.

- B. All persons shall wear hard hats. Appropriate eye and hearing protection must be used. Working in shorts is prohibited. Shirts must cover shoulders, back and abdomen. Working in tennis or jogging shoes, sandals, boots with high heels, cowboy and other slip-on type boots is prohibited. Hard-sole, lace-up footwear, zippered boots or boots cinched up with straps which fit snugly about the ankle are adequate. Wearing of safety boots is strongly recommended. In the vicinity of at-grade crossings, it is strongly recommended that reflective vests be worn.
- C. No one is allowed within 25' of the centerline of track without specific authorization from the flagman.
- D. All persons working near track while train is passing are to lookout for dragging bands, chains and protruding or shifted cargo.
- E. No one is allowed to cross tracks without specific authorization from the flagman.
- F. All welders and cutting torches working within 25' of track must stop when train is passing.
- G. No steel tape or chain will be allowed to cross or touch rails without permission from the Railroad.

13. GUIDELINES FOR EQUIPMENT ON RAILROAD RIGHT-OF-WAY:

- A. No crane or boom equipment will be allowed to set up to work or park within boom distance plus 15' of centerline of track without specific permission from Railroad official and flagman.
- B. No crane or boom equipment will be allowed to foul track or lift a load over the track without flag protection and track time.
- C. All employees will stay with their machines when crane or boom equipment is pointed toward track.
- D. All cranes and boom equipment under load will stop work while train is passing (including pile driving).
- E. Swinging loads must be secured to prevent movement while train is passing.
- F. No loads will be suspended above a moving train.
- G. No equipment will be allowed within 25' of centerline of track without specific authorization of the flagman.
- H. Trucks, tractors or any equipment will not touch ballast line without specific permission from Railroad official and flagman. Orange construction fencing may be required as directed.

- I. No equipment or load movement within 25' or above a standing train or Railroad equipment without specific authorization of the flagman.
- J. All operating equipment within 25' of track must halt operations when a train is passing. All other operating equipment may be halted by the flagman if the flagman views the operation to be dangerous to the passing train.
- K. All equipment, loads and cables are prohibited from touching rails.
- L. While clearing and grubbing, no vegetation will be removed from Railroad embankment with heavy equipment without specific permission from the Railroad Engineer and flagman.
- M. No equipment or materials will be parked or stored on Railroad's property unless specific authorization is granted from the Railroad Engineer.
- N. All unattended equipment that is left parked on Railroad property shall be effectively immobilized so that it cannot be moved by unauthorized persons.
- O. All cranes and boom equipment will be turned away from track after each work day or whenever unattended by an operator.
- P. Prior to performing any crane operations, the Contractor shall establish a single point of contact for the Railroad flagman to remain in communication with at all times. Person must also be in direct contact with the individual(s) directing the crane operation(s).

14. INSURANCE:

- A. In addition to any other forms of insurance or bonds required under the terms of the contract and specifications, the Prime Contractor will be required to carry insurance of the following kinds and amounts:
 - 1. a. Commercial General Liability Insurance having a combined single limit of not less than \$2,000,000 per occurrence for all loss, damage, cost and expense, including attorneys' fees, arising out of bodily injury liability and property damage liability during the policy period. Said policy shall include explosion, collapse, and underground hazard (XCU) coverage, shall be endorsed to name Railroad specified in item A.2.c. below both as the certificate holder and as an additional insured, and shall include a severability of interests provision.
 - b. Automobile Liability Insurance with a combined single limit of not less than \$1,000,000 each occurrence for injury to or death of persons and damage to or loss or destruction of property. Said policy or policies shall be endorsed to name Railroad specified in item A.2.c. below both as the certificate holder and as an additional insured and shall include a severability of interests provision.
 - 2. Railroad Protective Liability Insurance having a combined single limit of not less than \$2,000,000 each occurrence and \$6,000,000 in the aggregate applying separately to each annual period. If the project involves track over which passenger trains operate, the insurance limits required are not less than a combined single limit of \$5,000,000 each occurrence and \$10,000,000 in the aggregate applying separately to each annual period. Said policy shall provide coverage for all loss, damage or expense arising from

bodily injury and property damage liability, and physical damage to property attributed to acts or omissions at the job site.

The standards for the Railroad Protective Liability Insurance are as follows:

a. The insurer must be rated A- or better by A.M. Best Company, Inc.
NOTE: NS does not accept from insurers Chartis (AIG or Affiliated Company including Lexington Insurance Company), Hudson Group or Liberty or Affiliated Company, American Contractors Insurance Company and Erie Insurance Company including Erie Insurance Exchange and Erie Indemnity Company.

b. The policy must be written using one of the following combinations of Insurance Services Office (“ISO”) Railroad Protective Liability Insurance Form Numbers:

- (1) CG 00 35 01 96 and CG 28 31 10 93; or
- (2) CG 00 35 07 98 and CG 28 31 07 98; or
- (3) CG 00 35 10 01; or
- (4) CG 00 35 12 04; or
- (5) CG 00 35 12 07; or
- (6) CG 00 35 04 13.

c. The named insured shall read:

Norfolk Southern Corporation and its subsidiaries
Three Commercial Place
Norfolk, Virginia 23510-2191
Attn: Risk Manager

(NOTE: Railroad does not share coverage on RRPL with any other entity on this policy)

d. The description of operations must appear on the Declarations, must match the project description in this agreement, and must include the appropriate Sponsor project and contract identification numbers.

e. The job location must appear on the Declarations and must include the city, state, and appropriate highway name/number. **NOTE: Do not include any references to milepost, valuation station, or mile marker on the insurance policy.**

f. The name and address of the prime Contractor must appear on the Declarations.

g. The name and address of the Sponsor must be identified on the Declarations as the “Involved Governmental Authority or Other Contracting Party.”

h. Endorsements/forms that are required are:

- (1) Physical Damage to Property Amendment
- (2) Terrorism Risk Insurance Act (TRIA) coverage must be included

- i. Other endorsements/forms that will be accepted are:
 - (1) Broad Form Nuclear Exclusion – Form IL 00 21
 - (2) 30-day Advance Notice of Non-renewal or cancellation
 - (3) Required State Cancellation Endorsement
 - (4) Quick Reference or Index Form CL/IL 240

- j. Endorsements/forms that are NOT acceptable are:
 - (1) Any Pollution Exclusion Endorsement except CG 28 31
 - (2) Any Punitive or Exemplary Damages Exclusion
 - (3) Known injury or Damage Exclusion form CG 00 59
 - (4) Any Common Policy Conditions form
 - (5) An Endorsement that limits or excludes Professional Liability coverage
 - (6) A Non-Cumulation of Liability or Pyramiding of Limits Endorsement
 - (7) An Endorsement that excludes TRIA coverage
 - (8) A Sole Agent Endorsement
 - (9) Any type of deductible endorsement or amendment
 - (10) Any other endorsement/form not specifically authorized in item no. 2.h above.

- B. If any part of the work is sublet, similar insurance, and evidence thereof as specified in A.1 above, shall be provided by or on behalf of the subcontractor to cover its operations on Railroad’s right of way.

- C. All insurance required under the preceding subsection A shall be underwritten by insurers and be of such form and content, as may be acceptable to the Company. Prior to entry on Railroad right-of-way, the original electronic Railroad Protective Liability Insurance Policy shall be submitted by the Prime Contractor to the Department at the address below for its review and transmittal to the Railroad. In addition, certificates of insurance evidencing the Prime Contractor’s and any subcontractors’ Commercial General Liability Insurance shall be issued to the Railroad and the Department at the addresses below, and forwarded to the Department for its review and transmittal to the Railroad. The certificates of insurance shall state that the insurance coverage will not be suspended, voided, canceled, or reduced in coverage or limits without (30) days advance written notice to Railroad and the Department. No work will be permitted by Railroad on its right-of-way until it has reviewed and approved the evidence of insurance required herein.

SPONSOR:

RAILROAD:

Risk Management
Norfolk Southern Corporation and its subsidiaries
Three Commercial Place
Norfolk, Virginia 23510-2191
NSRISK3@NSCORP.COM

- D. The insurance required herein shall in no way serve to limit the liability of Sponsor or its Contractors under the terms of this agreement.

E. Insurance Submission Procedures

1. Railroad will only accept initial insurance submissions via email to NSRISK3@NSCORP.COM. Railroad will NOT accept initial insurance submissions via hard copies that would be sent either US Mail or Overnight carrier or faxes as only electronic versions only are to be submitted to Railroad. Please provide point of contact information with the submission including a phone number and email address.
2. Railroad requires the following two (2) forms of insurance in the initial electronic insurance submission to NSRISK3@NSCORP.COM to be submitted under a cover letter providing details of the project and containing the contact information:
 - a. The full original or certified true electronic countersigned copy of the railroad protective liability insurance policy in its entirety inclusive of all declarations, schedule of forms and endorsements along with the policy forms and endorsements.
 - b. The Contractor's commercial general, automobile, and workers' compensation liability insurance certificate of liability insurance evidencing a combined single limit of a minimum of \$2M per occurrence of general and \$1M per occurrence of automobile liability insurance naming Norfolk Southern Corporation and its subsidiaries, Three Commercial Place, Norfolk, VA 23510 as the certificate holder and as an additional insured on both the general and automobile liability insurance policy.
3. It should be noted that the Railroad does not accept notation of Railroad Protective insurance on a certificate of liability insurance form or Binders as Railroad must have the full original or certified true electronic countersigned policy. Further, please note that mere receipt of the policy is not the only issue but review for compliance. Due to the number of projects system-wide, it typically takes a minimum of 30-45 days for the Railroad to review.

15. FAILURE TO COMPLY:

- A. In the event the Contractor violates or fails to comply with any of the requirements of these Special Provisions:
 1. The Railroad Engineer may require that the Contractor vacate Railroad property.
 2. The Sponsor's Engineer may withhold all monies due the Contractor on monthly statements.
- B. Any such orders shall remain in effect until the Contractor has remedied the situation to the satisfaction of the Railroad Engineer and the Sponsor's Engineer.

16. PAYMENT FOR COST OF COMPLIANCE:

- A. No separate payment will be made for any extra cost incurred on account of compliance with these special provisions. All such costs shall be included in prices bid for other items of the work as specified in the payment items.

17. PROJECT INFORMATION

- A. Date: _____
- B. NS File No.: _____
- C. NS Milepost: _____
- D. Sponsor's Project No.: _____

**Attachment D – Norfolk Southern - Contractor Right of Entry
Agreement**

NORFOLK SOUTHERN
CONTRACTOR RIGHT OF ENTRY AGREEMENT

WHEREAS, _____ (“Principal”) has requested that Norfolk Southern Railway Company (“Company”) permit Principal to be on or about Company’s premises and/or facilities in the vicinity of Company Milepost SC-22.96 (Coastal) (the “Premises”) for the sole purpose of widening N. Maple Street (S-131), on behalf of South Carolina Department of Transportation (the “Project Sponsor”) during the period _____, 20____, to _____, 20____ (the “Right of Entry”).

WHEREAS, Company is willing to grant the Right of Entry subject to the terms and conditions set forth herein.

NOW THEREFORE, in consideration of the foregoing and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and intending to be legally bound hereby, the parties hereby agree as follows.

Company hereby grants Principal the Right of Entry. The Right of Entry shall extend to Principal and to subcontractors and other entities affiliated with Principal who are specifically approved for entry by authorized representatives of Company in writing, as well as to the officers and employees of the foregoing (collectively “Licensees”). The Right of Entry shall apply to those portions of the Premises, and to such equipment, machinery, rolling stock and other personal property and fixtures belonging to Company or otherwise located on the Premises, only to the extent specifically designated and approved in writing by authorized representatives of Company (collectively, “Designated Property”).

Principal agrees:

- (i) that Licensees’ access to the Premises shall be limited to the Designated Property and that Principal shall be liable and fully responsible for all actions of Licensees while on the Premises pursuant to the Right of Entry;
- (ii) that Licensees shall (a) be subject to Company’s direction when upon the Premises, and (b) be subject to Company’s removal from the Premises, in Company’s sole discretion, due to negligence, misconduct, unsafe actions, breach of this agreement or the failure to act respectfully, responsibly, professionally, and/or in a manner consistent with Company’s desire to minimize risk and maintain its property with maximum security and minimum distractions or disruptions or for any other lawful reason;
- (iii) that Licensees shall perform all work with such care, diligence and cooperation with Company personnel as to reasonably avoid accidents, damage or harm to persons or property and delays or interference with the operations of any Company’s facilities and in accordance with Company’s “Special Provisions for Protection of Railway Interest”, attached and incorporated herein.
- (iv) to give Company’s officer signing this agreement, or his or her authorized representative, advance notification of the presence of Licensees on Designated Property in accordance with Company’s “Special Provisions for Protection of Railway Interest”;
- (v) to indemnify and save harmless Company, its officers, agents and employees from and against any and all claims, demands, losses, suits, judgments, costs, expenses (including without limitation reasonable attorney’s fees) and liability resulting from (a) injury to or death of any person, including without limitation the Licensees, and damage to or loss of any property, including without limitation that belonging to or in the custody of Licensees (the “Licensee Property”), arising or in any manner growing out of the presence of either the Licensees or the Licensee Property, or both, on or about the Premises, regardless of

whether negligence on the part of Company, its officers, agents or employees caused or contributed to said loss of life, personal injury or property loss or damage in whole or in part; (b) any alleged violation of any law, statute, code, ordinance or regulation of the United States or of any state, county or municipal government (including, without limitation, those relating to air, water, noise, solid waste and other forms of environmental protection, contamination or pollution or to discrimination on any basis) that results in whole or in part, directly or indirectly, from the activities of Licensees related in any way to their presence on the Premises or from any other act or omission of Licensees contributing to such violation, regardless of whether such activities, acts or omissions are intentional or negligent, and regardless of any specification by Company without actual knowledge that it might violate any such law, statute, code, ordinance or regulation; (c) any allegation that Company is an employer or joint employer of a Licensee or is liable for related employment benefits or tax withholdings; or (d) any decision by Company to bar or exclude a Licensee from the Premises pursuant to subsection (ii)(b) above;

- (vi) to have and keep in effect the appropriate kinds of insurance as listed in the Company's "Special Provisions for Protection of Railway Interest, with insurance companies satisfactory to Company, during the entire time Licensees or Licensee Property, or both, is on the Premises; and to provide certificates of insurance showing the foregoing coverage, as well as any endorsements or other proper documentation showing and any change or cancellations in the coverage to the Company officer signing this agreement or to his or her authorized representative;
- (vii) to reimburse Company for any costs not covered under the existing project agreement between the Company and the Project Sponsor, including any material, labor, supervisory and protective costs (including flagging) and related taxes and overhead expenses required or deemed necessary by Company because of the presence of either Licensees or Licensee Property on the Premises;
- (viii) to exercise special care and precautions to protect the Premises and equipment, machinery, rolling stock and other personal property and fixtures belonging to Company or otherwise located on the Premises (whether or not constituting Designated Property) and to avoid interference with Company's operations;
- (ix) to not create and not allow drainage conditions which would be adverse to the Premises or any surrounding areas;
- (x) to refrain from the disposal or release of any trash, waste, and hazardous, dangerous or toxic waste, materials or substances on or adjacent to the Premises and to clean up or to pay Company for the cleanup of any such released trash, waste, materials or substances; and
- (xi) to restore the Premises and surrounding areas to its original condition or to a condition satisfactory to the Company officer signing this agreement or to his or her authorized representative (ordinary wear and tear to rolling stock and equipment excepted) upon termination of Licensees' presence on the Premises.

As a part of the consideration hereof, Principal further hereby agrees that Company shall mean not only Norfolk Southern Railway Company but also Norfolk Southern Corporation and any and all subsidiaries and affiliates of Norfolk Southern Railway Company or Norfolk Southern Corporation, and that all of Principal's indemnity commitments in this agreement in favor of Company also shall extend to and indemnify Norfolk Southern Corporation and any subsidiaries and affiliated companies of Norfolk Southern Railway Company or Norfolk Southern Corporation and its and/or their directors, officers, agents and employees.

It is expressly understood that the indemnification obligations set forth herein cover claims by Principal's employees, agents, independent contractors and other representatives, and Principal expressly waives any defense to or immunity from such indemnification obligations and/or any subrogation rights available under any applicable state constitutional provision, laws, rules or regulations, including, without limitation, the workers' compensation laws of any state. Specifically, (i) in the event that all or a portion of the

Premises is located in the State of Ohio, the following provision shall be applicable: "Principal, with respect to the indemnification provisions contained herein, hereby expressly waives any defense or immunity granted or afforded it pursuant to Section 35, Article II of the Ohio Constitution and Section 4123.74 of the Ohio Revised Code"; and (ii) in the event that all or a portion of the Premises is located in the Commonwealth of Pennsylvania, the following provision shall be applicable: "Principal, with respect to the indemnification provisions contained herein, hereby expressly waives any defense or immunity granted or afforded it pursuant to the Pennsylvania Workers' Compensation Act, 77 P.S. 481".

This agreement shall be governed by the internal laws of the Commonwealth of Virginia, without regard to otherwise applicable principles of conflicts of laws. If any of the foregoing provisions is held for any reason to be unlawful or unenforceable, the parties intend that only the specific words found to be unlawful or unenforceable be severed and deleted from this agreement and that the balance of this agreement remain a binding enforceable agreement to the fullest extent permitted by law.

This agreement may be amended only in a writing signed by authorized representatives of the parties.

Name of Principal: _____

By: _____

Print Name: _____

Title _____

Date _____, 20____

NORFOLK SOUTHERN RAILWAY COMPANY

By _____

Print Name D.A. Becker

Title Chief Engineer – Design and Construction

Date _____, 20 _____

**Attachment E – Norfolk Southern – Railroad Signal Plans (For
Information Only)**

SH. NO.	CONTENTS	REV. NO.
NX1	INDEX SHEET	1
1	LAYOUT	1
2	PROFILE	1
3	CABLE PLAN	1
4	LOAD CENTER	1
5	CHARGERS & BATTERIES	1
6	GCP4000 CHASSIS & MODULE LAYOUT	1
7	GCP4000 PROGRAMMING	1
8	GCP4000 PROGRAMMING	1
9	CONNECTORS FOR TRACK MODULES	1
10	CPU MODULE & SEAR III HOOK-UPS	1
11	SEAR III PROGRAMMING	1
12	BACKHAUL EQUIPMENT	1
13	SSCC#1 MODULE HOOK-UP	1
14	SSCC#2 MODULE HOOK-UP	1
15	TD-4, XTR	1
16	CANTILEVER FLASHER LIGHTS	1
17	SIGNAL "A" S-40 GATE & FLASHER CIRCUITS	1
18	SIGNAL "B" S-40 GATE & FLASHER CIRCUITS	1
19	BACKBOARD 1A	1
20	BACKBOARD 1B	1
21	SIDE A LAYOUT & RACK PLACEMENT	1
22	SIDE C LAYOUT	1
23	SIDE B LAYOUT & TOP VIEW	1

**For Information Only
Norfolk Southern Signal Plans**

REVISIONS

1	02-24-21	WJK	XRL	PEH
NEW PLAN DRAWN ACCOUNT OF NEW SHELTER.				
FILE: 11.0974				
IN SERVICE: XX-XX-XX				
PER: XXX			XXX	XXX


IN SERVICE _____ SIGNED _____ DATE _____

S&E ENGINEERING COPY

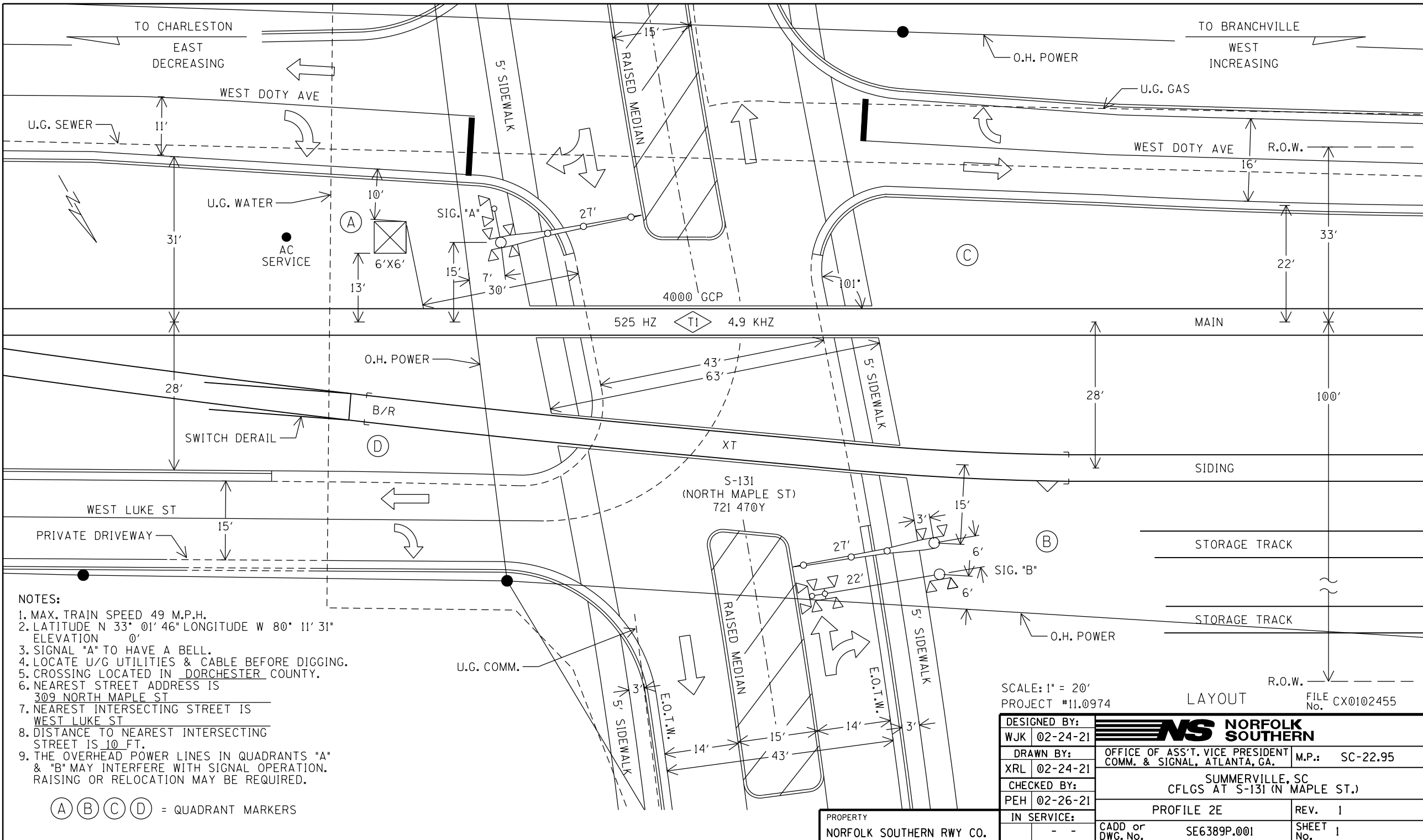
CONSTRUCTION OFFICE COPY
RETURN TO S&E ENG. AFTER COMPLETION

FIELD COPY
RETURN TO CASE AFTER COMPLETION

PROJECT ENGINEER COPY

DESIGNED BY:			
WJK 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	SC-22.95
DRAWN BY:	SUMMERVILLE, SC		
XRL 02-24-21	CFLGS AT S-131 (N MAPLE ST.)		
CHECKED BY:	PROFILE 2E		
PEH 02-26-21	IN SERVICE:		REV. 1
	- -	CADD or DWG. No.	SHEET 1
		SE6389P.NX1	No.

PROPERTY
NORFOLK SOUTHERN Rwy CO.



- NOTES:**
1. MAX. TRAIN SPEED 49 M.P.H.
 2. LATITUDE N 33° 01' 46" LONGITUDE W 80° 11' 31" ELEVATION 0'
 3. SIGNAL "A" TO HAVE A BELL.
 4. LOCATE U/G UTILITIES & CABLE BEFORE DIGGING.
 5. CROSSING LOCATED IN DORCHESTER COUNTY.
 6. NEAREST STREET ADDRESS IS 309 NORTH MAPLE ST
 7. NEAREST INTERSECTING STREET IS WEST LUKE ST
 8. DISTANCE TO NEAREST INTERSECTING STREET IS 10 FT.
 9. THE OVERHEAD POWER LINES IN QUADRANTS "A" & "B" MAY INTERFERE WITH SIGNAL OPERATION. RAISING OR RELOCATION MAY BE REQUIRED.

(A) (B) (C) (D) = QUADRANT MARKERS

SCALE: 1" = 20'
 PROJECT #11.0974
 LAYOUT
 FILE NO. CX0102455

DESIGNED BY: WJK 02-24-21			M.P.:	SC-22.95
DRAWN BY: XRL 02-24-21			OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	
CHECKED BY: PEH 02-26-21	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)			
IN SERVICE: - -	PROFILE 2E	REV. 1		
PROPERTY NORFOLK SOUTHERN RY CO.	CADD or DWG. No. SE6389P.001	SHEET 1		

TO CHARLESTON
EAST
DECREASING

TO BRANCHVILLE
WEST
INCREASING

← APP. HICKORY ST.
RICHARSON AVE. (S-165) →

INDUSTRIAL APP. ST. →

INDUSTRIAL DR. →

2521'
TO NEAREST
GCP WIRES

2521'
TO NEAREST
GCP WIRES

FLGS

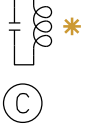
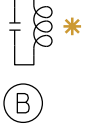
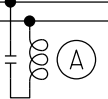
GCP4000

T1

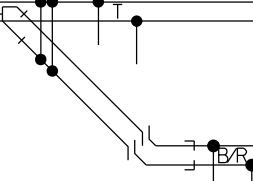
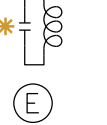
INDUSTRIAL

CFLGS

CFLGS



525 HZ
4.9 KHZ



B/R

XT

CFLGS

RICHARSON AVE.
(SR-165)
#721 472M
GCP3000
348 HZ

S-131
(N MAPLE ST.)
#721 470Y

1581'

687'

236'

74'
71'
68'
65'

0'
9'

65'
74'

1294'

1334'

1463'

1506'

2417'

(A) - MF-NBS FSS-1E 250849-004 (525HZ) (E) - MF-NBS 62775-1543 (211HZ)

(B) - MF-NBS 62775-8621 (114HZ)

(C) - MF-NBS 62775-1543 (348HZ)

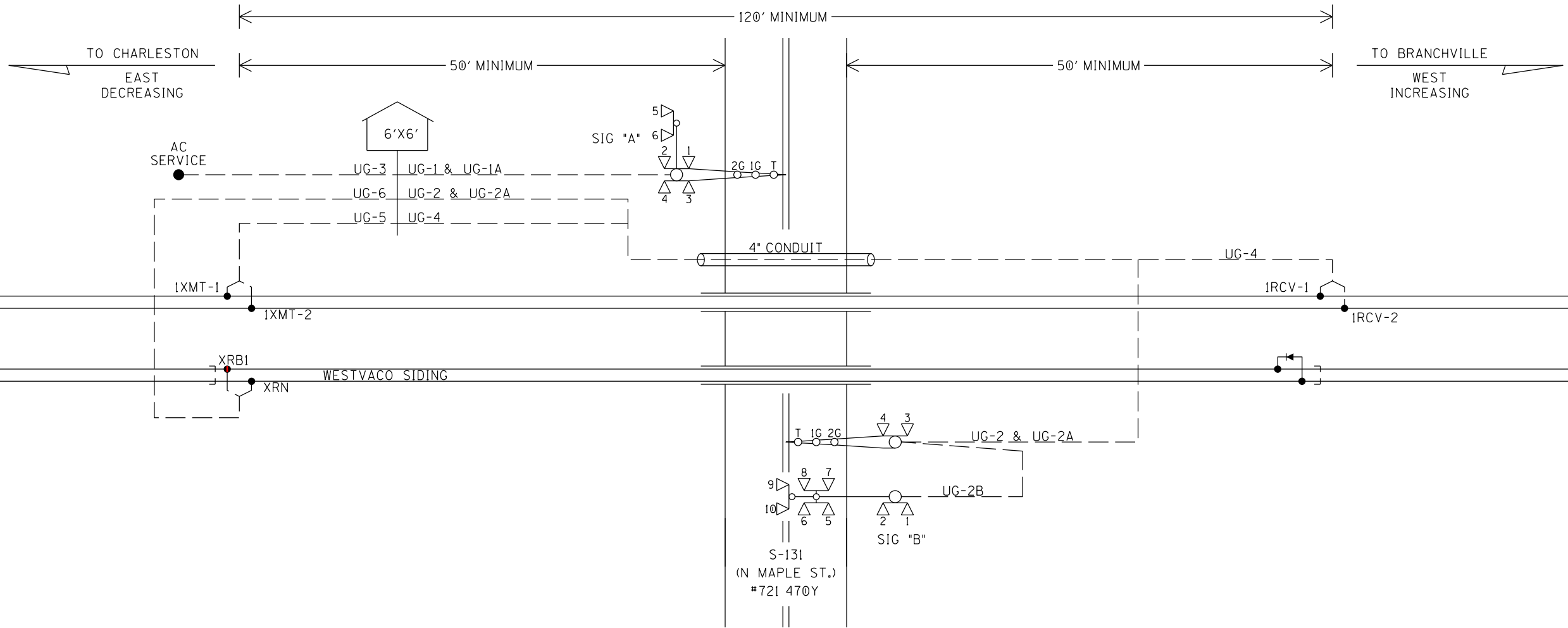
(D) - MF-NBS 62775-1543 (285HZ)

* = EXISTING

PROFILE

PROPERTY
NORFOLK SOUTHERN RY CO.

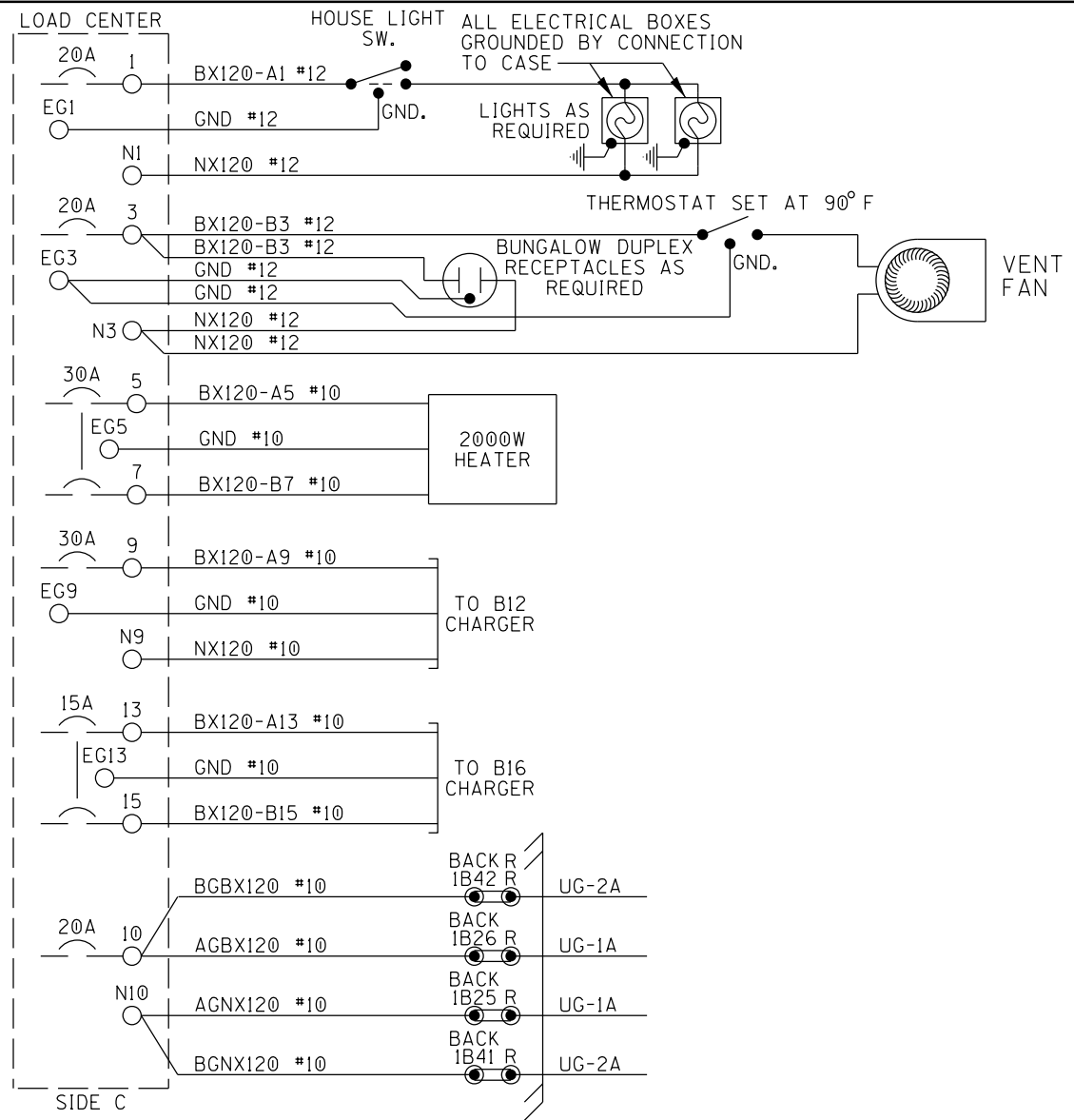
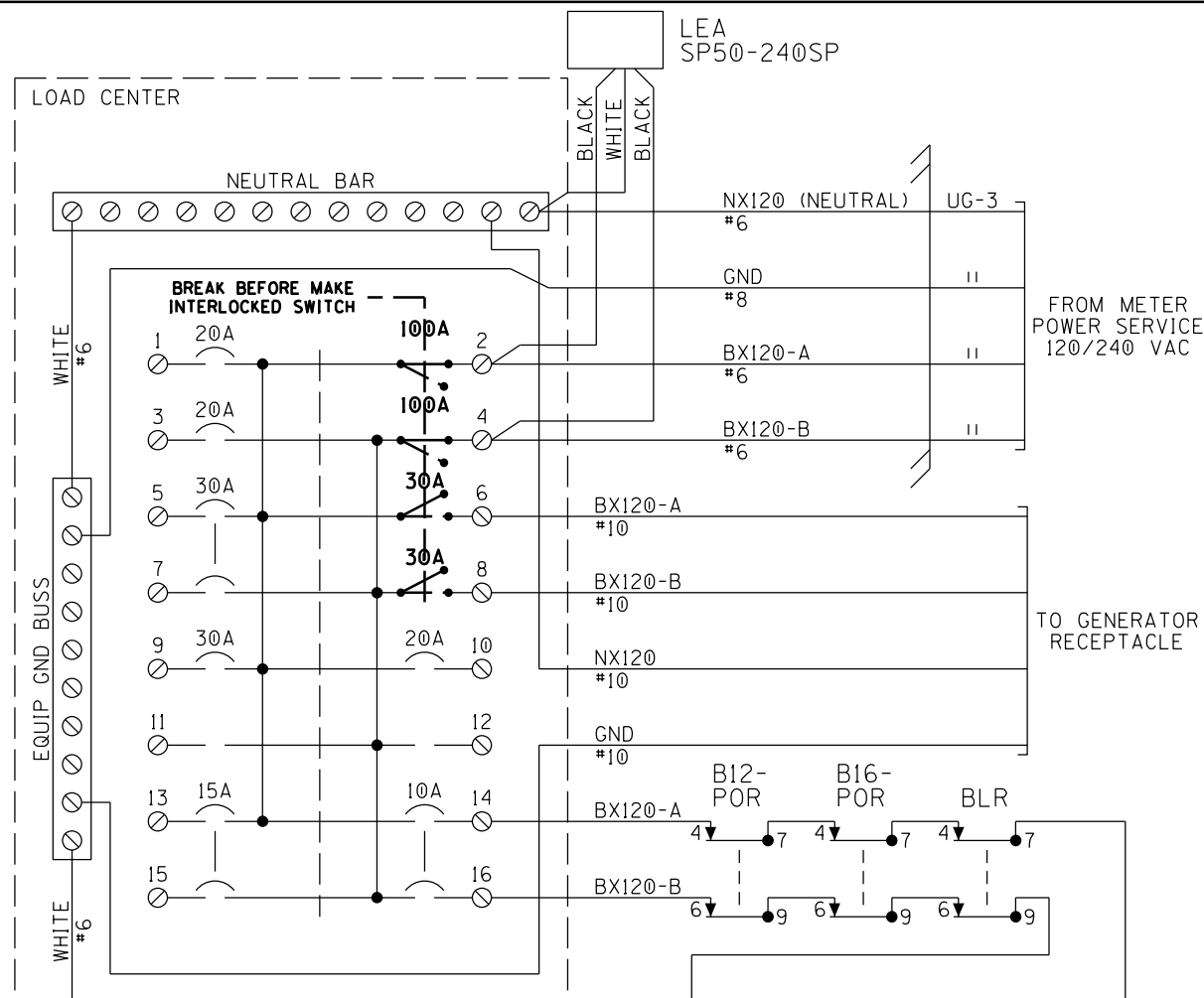
DESIGNED BY: WJK 02-24-21		
DRAWN BY: XRL 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: SC-22.95
CHECKED BY: PEH 02-26-21	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)	
IN SERVICE: - -	PROFILE 2E	REV. 1
	CADD or DWG. No. SE6389P.002	SHEET No. 2



UG-1-5CUG #6 AEC AEZ AEB B16-A N16-A	UG-1A-12CUG #14 AXG NAXG AXX IAXX AGD XGP1 AGBX120 AGNX120 SPARE SPARE SPARE SPARE	UG-2A-12CUG #14 BXC NBXC BXX IBXX BGD XGP1 XGP BGBX120 BCNX120 SPARE SPARE SPARE	UG-2B-5CUG #6 BEC BEZ BEB SPARE SPARE	UG-3-3CUG #6 W/#8 GND BX120-A BX120-B NX120 GND	UG-4-TW. PR. #6 1RCV-1 1RCV-2	UG-6-TW. PR. #6 XRB1 XRN
UG-2-5CUG #6 BEC BEZ BEB B16-B N16-B					UG-5-TW. PR. #6 1XMT-1 1XMT-2	

CABLE PLAN

DESIGNED BY: WJK 02-24-21		
DRAWN BY: XRL 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: SC-22.95
CHECKED BY: PEH 02-26-21	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)	
IN SERVICE: - -	PROFILE 2E	REV. 1
PROPERTY NORFOLK SOUTHERN RY. CO.	CADD or DWG. No. SE6389P.003	SHEET 3



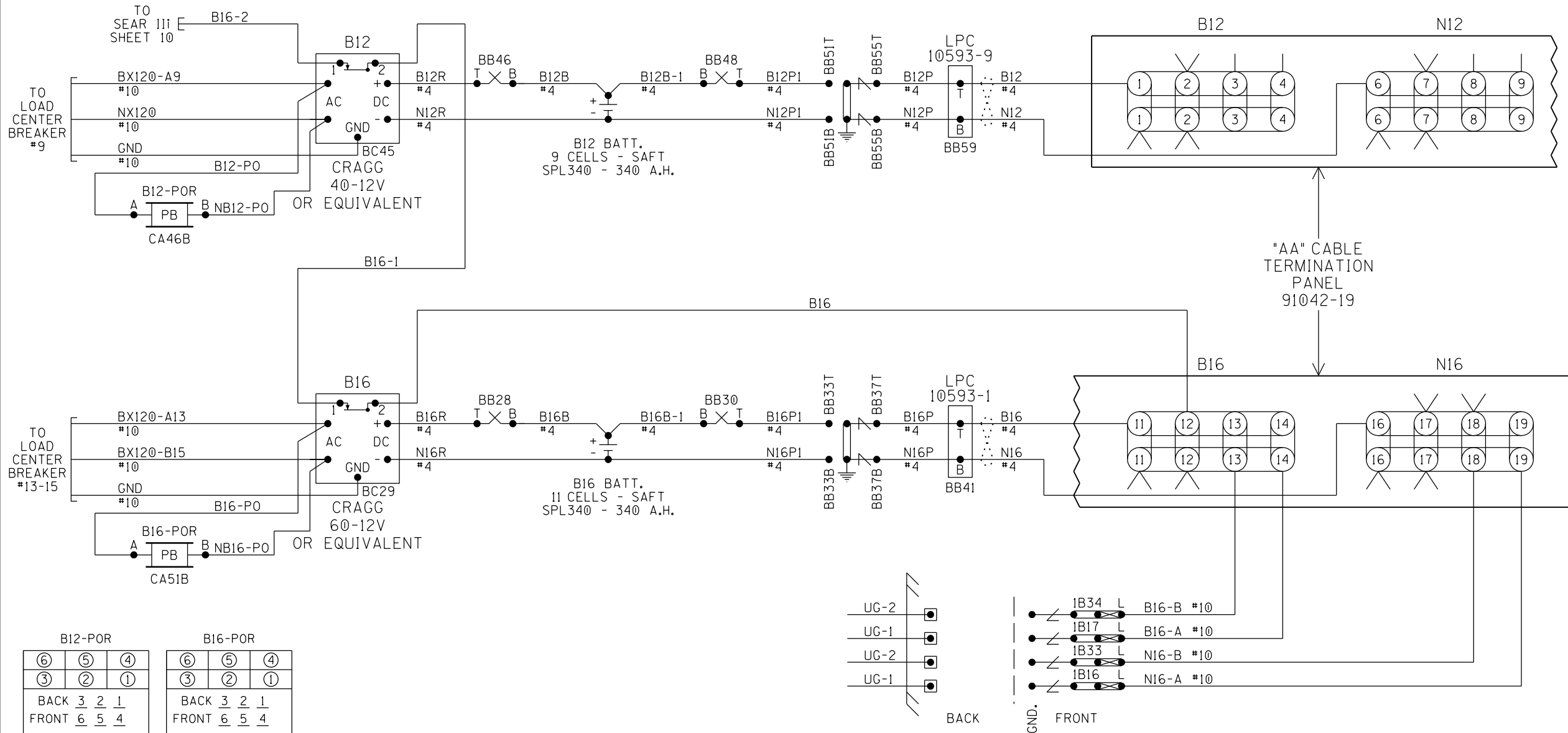
- GND. SQUARE "D" PART NUMBERS:
- LOAD CENTER — Q0132L125G
 - 10A 2P CIR BKR — Q0210
 - 15A 2P CIR BKR — Q0215
 - 20A 1P CIR BKR — Q0120
 - 30A 1P CIR BKR — Q0130
 - 30A 2P CIR BKR — Q0230
 - 60A 2P CIR BKR — Q0260
 - 100A 2P CIR BKR — Q02100
 - MECH INTERLOCK — PK4DT1M4LA
 - GENERATOR RECEPTACLE:
 - MALE CONNECTOR — NEMA L1430-F1

- NOTES:
1. ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.
 2. ALL AC WIRING TO LOAD CENTER TO BE IN METALLIC CONDUIT WITH NO EXPOSED TERMINALS. ALL AC 120V AND 240V EQUIPMENT TO BE PROPERLY GROUNDED.
 3. ● = INSULATED NUTS TO BE USED ON ALL TERMINALS OF 120VAC AND ABOVE.

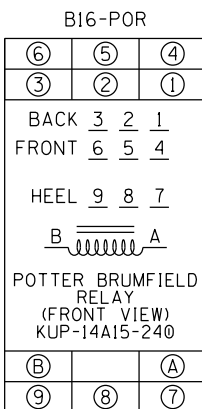
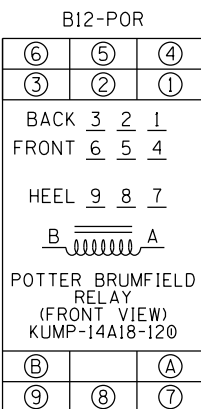
PROPERTY
NORFOLK SOUTHERN RYW CO.

LOAD CENTER

DESIGNED BY: WJK 02-24-21			M.P.:	SC-22.95
DRAWN BY: XRL 02-24-21			OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	
CHECKED BY: PEH 02-26-21	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)			
IN SERVICE: - -	PROFILE 2E	REV.	1	
	CADD or DWG. No. SE6389P.004	SHEET	4	



"AA" CABLE
TERMINATION
PANEL
91042-19

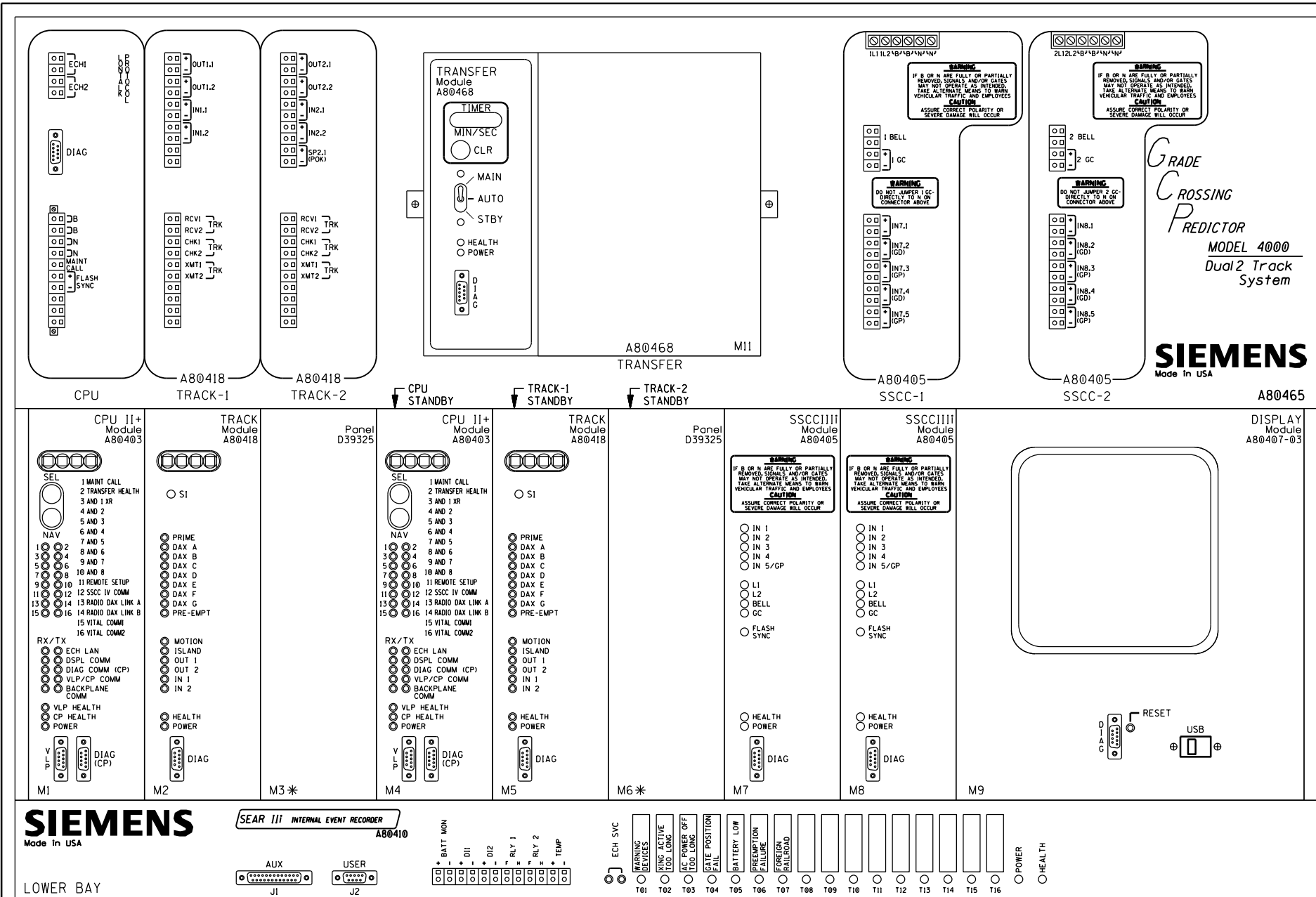


- NOTES:
- ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.
 - = TWIST

CHARGERS & BATTERIES

DESIGNED BY: WJK 02-24-21		
DRAWN BY: XRL 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: SC-22.95
CHECKED BY: PEH 02-26-21	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)	
IN SERVICE: - -	PROFILE 2E	REV. 1
PROPERTY NORFOLK SOUTHERN RY. CO.	CADD or DWG. No. SE6389P.005	SHEET 5

PROPERTY
NORFOLK SOUTHERN RY. CO.



GCP4000 CHASSIS & MODULE LAYOUT

Program Report

Location and SIN

DOT Number: 721470Y
 Milepost Number: SC-22.95
 Site Name: S-131 (N MAPLE ST)

SIN: 755013214416

MCF and Template Selection

MCF Name: GCP-T6X-02-1.mcf
 MCF Revision: 021
 MCF CRC: 6076E435

Template = 1A:6 Trk Bi

Check Numbers

Office Check No. (DT 4.6.0): 26152140
 Office Check Number: 26152140
 Config. Check Number: 389296C3
 (Based on MCF Revision 021)

Program

BASIC: module configuration
 Track 1 Slot = Track
 Track 2/RIO 1 Slot = Not Used
 Track 3 Slot = Not Used
 Track 4 Slot = Not Used
 Track 5/RIO 2 Slot = Not Used
 Track 6/RIO 3 Slot = Not Used
 SSSC-1 Slot = SSSC31
 SSSC-2 Slot = SSSC31
 SEAR Used = Yes

BASIC: MS/GCP operation
 Track 1: MS/GCP Operation = Yes

BASIC: island operation
 Track 1: Island Used = Internal

BASIC: preemption
 Preempt Logic = No

BASIC: radio Dax links
 Radio DAX link A Used = No
 Radio DAX link B Used = No

BASIC: Vital Comms links
 Vital Comms link 1 Used = No
 Vital Comms link 2 Used = No

PREDICTORS: track 1
 Track 1: Prime Used = Yes
 Track 1: Dax A Used = No
 Track 1: Dax B Used = No
 Track 1: Dax C Used = No
 Track 1: Dax D Used = No
 Track 1: Dax E Used = No
 Track 1: Dax F Used = No
 Track 1: Dax G Used = No

GCP: track 1
 Track 1: GCP Freq Category = Standard
 Track 1: GCP Frequency = 525 Hz
 Track 1: Approach Distance = 2521 ft
 Track 1: Uni/Bi/Sim-Bidirnl = Bidirnl
 Track 1: GCP Transmit Level = Medium
 Track 1: Island Connection = Isl
 Track 1: Island Distance = 148 ft
 Track 1: Computed Distance = 9999 ft
 Track 1: Linearization Steps = 100

GCP: track 1 enhanced det
 Track 1: Inbound PS Sensitivity = Off
 Track 1: Speed Limiting Used = Yes
 Track 1: Outbound False Act Lvl = Normal
 Track 1: Outbound PS Timer = 20 sec
 Track 1: Trailing Switch Logic = On
 Track 1: Post Joint Detn Time = 15 sec
 Track 1: Adv Appr Predn = No
 Track 1: Cancel Pickup Delay = This Isl

GCP: track 1 prime
 Track 1: Prime Warning Time = 30 sec
 Track 1: Prime Offset Distance = 0 ft
 Track 1: Switch MS EZ Level = 10
 Track 1: Prime MS/GCP Mode = Pred
 Track 1: Prime Pickup Delay = 15 sec
 Track 1: Prime UAX = Not Used

GCP: track 1 pos start
 Track 1: Positive Start = Off
 Track 1: Sudden Shnt Det Used = No
 Track 1: Low EZ Detection Used = No

GCP: track 1 MS Control
 Track 1: MS/GCP Ctrl IP Used = No
 Track 1: MS Sensitivity Level = 0
 Track 1: Compensation Level = 1300
 Track 1: Warn Time-Ballast Comp = High
 Track 1: Low EX Adjustment = 39
 Track 1: Bidirnl Dax Passthru = No
 Track 1: False Act on Train Stop = No
 Track 1: EX Limiting Used = Yes
 Track 1: EZ Correction Used = Yes

ISLAND: track 1
 Track 1: Isl Frequency = 4.9 kHz
 Track 1: Pickup Delay (2s +) = 0 sec
 Track 1: Isl Enable IP Used = No

AND: track Anding
 AND 1 XR Used = Yes
 AND 2 Used = No
 AND 3 Used = No
 AND 4 Used = No
 AND 5 Used = No
 AND 6 Used = No
 AND 7 Used = No
 AND 8 Used = No

AND: AND 1 XR
 AND 1 XR Track 1 = Prime
 AND 1 Enable Used = Yes
 And 1 Enable Pickup = 5 sec
 AND 1 Enable Drop = 0 sec
 AND 1 Wrap Used = No

ADVANCED: MS restart
 MS/GCP Restart Used = No

ADVANCED: out of service
 OOS Control = Display+OOS IPs
 OOS Timeout = Yes
 OOS Timeout = 1 hrs

ADVANCED: out of service 2
 T1 OOS Control = OOS Input 1

ADVANCED: track wrap circuits
 Wrap LOS Timer = 5 sec
 Track 1 Wrap Used = No

ADVANCED: trk 1 overrides
 Track 1: All Predictors Override Used = No

ADVANCED: OR logic
 OR 1 Used = No
 OR 2 Used = No
 OR 3 Used = No
 OR 4 Used = No

ADVANCED: internal I/O 1
 Pass Thrus = No
 Int.1 Sets = Not Used
 Int.1 Set by = Not Used
 Int.2 Sets = Not Used
 Int.2 Set by = Not Used
 Int.3 Sets = Not Used
 Int.3 Set by = Not Used
 Int.4 Sets = Not Used
 Int.4 Set by = Not Used

ADVANCED: internal I/O 2
 Int.5 Sets = Not Used
 Int.5 Set by = Not Used
 Int.6 Sets = Not Used
 Int.6 Set by = Not Used
 Int.7 Sets = Not Used
 Int.7 Set by = Not Used
 Int.8 Sets = Not Used
 Int.8 Set by = Not Used

ADVANCED: internal I/O 3
 Int.9 Sets = Not Used
 Int.9 Set by = Not Used
 Int.10 Sets = Not Used
 Int.10 Set by = Not Used
 Int.11 Sets = Not Used
 Int.11 Set by = Not Used
 Int.12 Sets = Not Used
 Int.12 Set by = Not Used

ADVANCED: internal I/O 4
 Int.13 Sets = Not Used
 Int.13 Set by = Not Used
 Int.14 Sets = Not Used
 Int.14 Set by = Not Used
 Int.15 Sets = Not Used
 Int.15 Set by = Not Used
 Int.16 Sets = Not Used
 Int.16 Set by = Not Used


ADVANCED: site options
 Daylight Savings = On
 Units = Standard
 Maint Call Rpt IP Used = No
 Emergency Activate IP = No
 EZ/EX Logging = Change
 EZ/EX Point Change = 3

SSCC
 Gates Used = Yes
 SSSC1+2 GPs Coupled = Yes
 Min Activation = 0 sec
 Rmt Activation Cancel = 2 min
 Bell On Gate Rising = No
 Mute Bell On Gate Down = No
 SSSCIV Controller Used = No

SSCC: 1
 SSSC-1 Activation = AND 1 XR
 SSSC-1 Gate Delay = 6 sec
 SSSC-1 Number of GPs = 1
 SSSC-1 Number of GDs = 2
 SSSC 1: Flash Rate = 40
 SSSC 1: Low Battery Detection = No
 SSSC 1: Flash Sync = master
 SSSC 1: Invert Gate Output = No
 SSSC 1: Lamp Neutral Test = Off
 Aux-1 Xng Ctrl Used = No

SSCC: 2
 SSSC-2 Activation = AND 1 XR
 SSSC-2 Gate Delay = 6 sec
 SSSC-2 Number of GPs = 0
 SSSC-2 Number of GDs = 0
 SSSC 2: Flash Rate = 40
 SSSC 2: Low Battery Detection = No
 SSSC 2: Flash Sync = slave
 SSSC 2: Invert Gate Output = No
 SSSC 2: Lamp Neutral Test = Off
 Aux-2 Xng Ctrl Used = No

GCP4000 PROGRAMMING

DESIGNED BY:			
WJK 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	SC-22.95
DRAWN BY:	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)		
XRL 02-24-21	PROFILE 2E		
PEH 02-26-21	REV. 1		
PROPERTY	IN SERVICE:	CADD or DWG. No.	SHEET No.
NORFOLK SOUTHERN RWY CO.	- -	SE6389P.007	7

OUTPUT: assignment page 1
OUT 1.1 = Not Used
OUT 1.2 = Not Used

INPUT: assignment page 1
IN 1.1 = AND 1 XR Enable
IN 1.2 = Not Used

IO: assignment SSCC
OUT GC 1 = Gate Output 1
OUT GC 2 = Gate Output 2
IN 7.1 = Not Used
IN 7.2 = GD 1.2
IN 7.3 = AND 1 XR Enable
IN 7.4 = GD 1.1
IN 7.5 = GP 1.1
IN 8.1 = Out Of Service IP 1
IN 8.2 = Not Used
IN 8.3 = Not Used
IN 8.4 = Not Used
IN 8.5 = Not Used

SEAR
SEAR Subnode = 3
DI 1 = Not Used
DI 2 = Not Used
Rly 1 = General1
Rly 2 = Not Used

SEAR: inputs
SP 2.1 = POK 1
SP 3.1 = Not Used
SP 4.1 = Not Used
SP 5.1 = Not Used
SP 6.1 = Not Used

SEAR: slot 1-4 inputs
IN 1.2 = Not Used
IN 2.1 = Not Used
IN 2.2 = Not Used
IN 3.1 = Not Used
IN 3.2 = Not Used
IN 4.1 = Not Used
IN 4.2 = Not Used

SEAR: inputs slot 5
IN 5.1 = Not Used
IN 5.2 = Not Used

SEAR: inputs slot 6
IN 6.1 = Not Used
IN 6.2 = Not Used


SEAR: slot 7-8 inputs
IN 7.1 = Not Used
IN 8.2 = Not Used
IN 8.3 = Not Used
IN 8.4 = Not Used
IN 8.5 = Not Used

SITE: programming
Radio Subnode = 1
Field Password = Off
Low Battery Enabled = Off

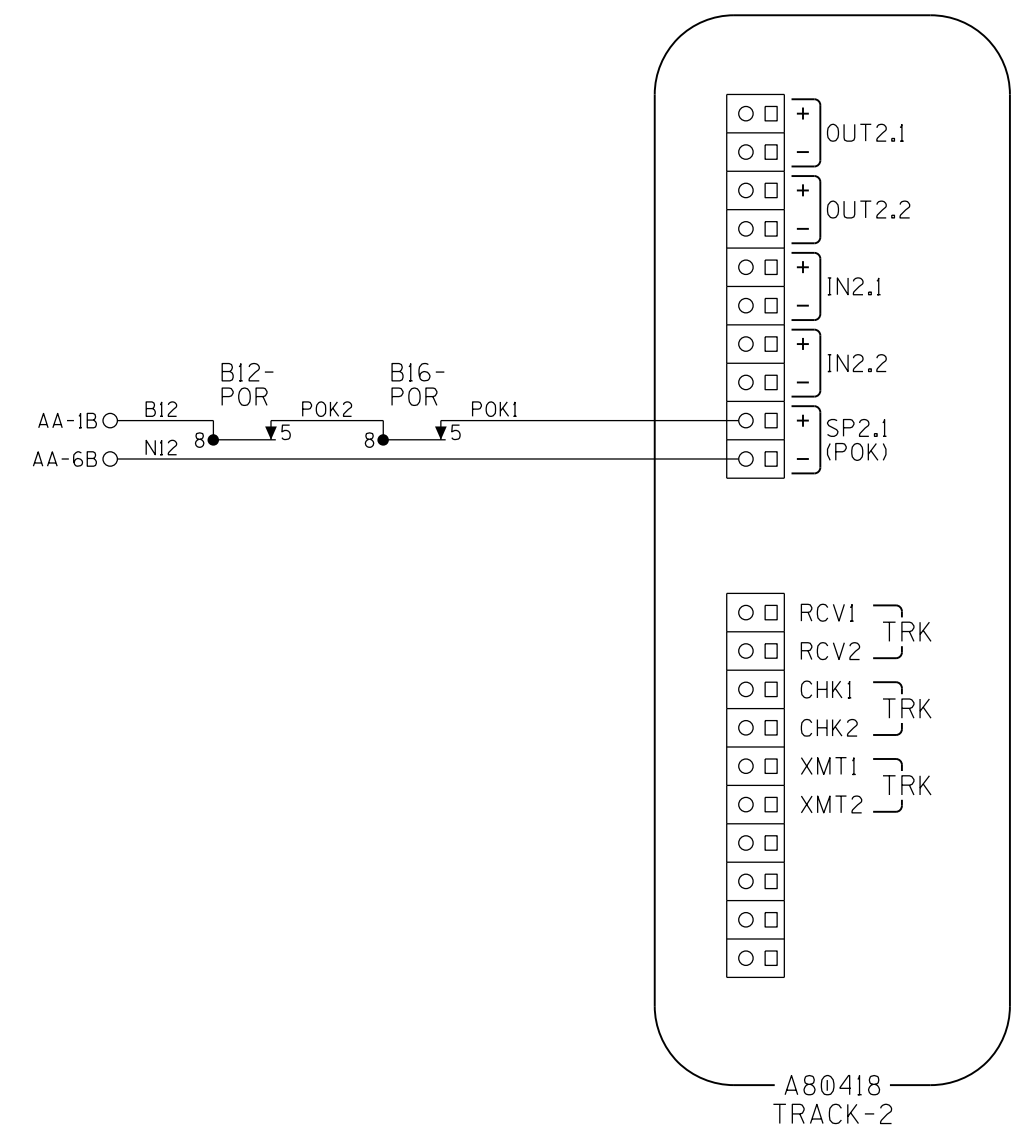
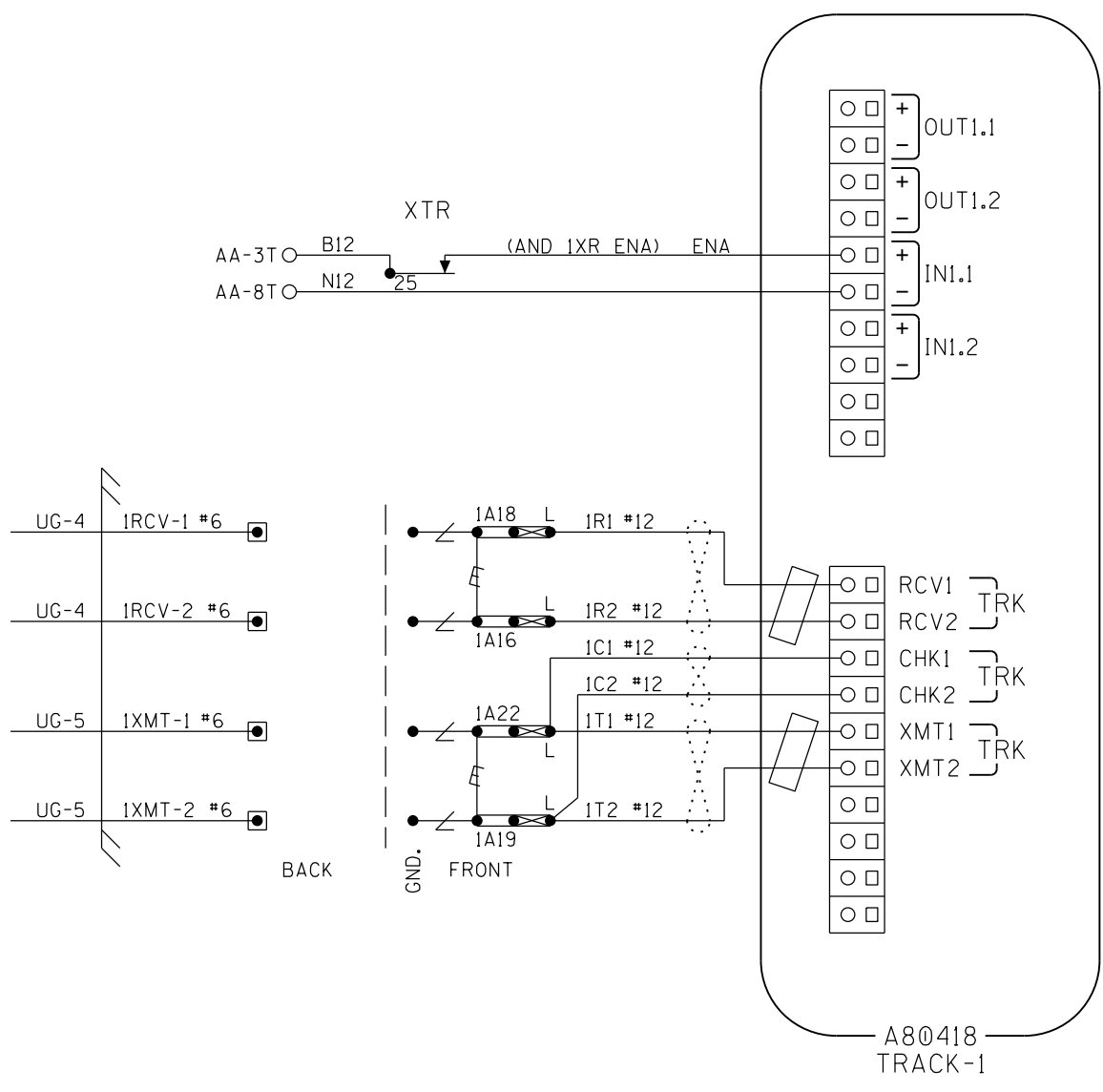
Configuration Package File

Filename: se6389.pac

GCP4000 PROGRAMMING

DESIGNED BY:			
WJK 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.		M.P.: SC-22.95
DRAWN BY:	SUMMERVILLE, SC		
XRL 02-24-21	CFLGS AT S-131 (N MAPLE ST.)		
CHECKED BY:	PROFILE 2E		REV. 1
PEH 02-26-21	CADD or DWG. No. SE6389P.008		SHEET No. 8
IN SERVICE:	-		

PROPERTY
NORFOLK SOUTHERN RYW CO.



- NOTES:
1. ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.
 2. = TWIST
 3. = FERRITE BEAD

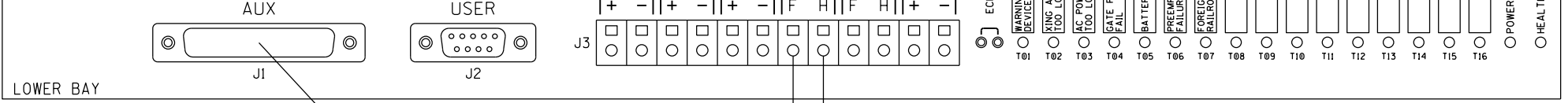
CONNECTORS FOR TRACK MODULES

DESIGNED BY: WJK 02-24-21		
DRAWN BY: XRL 02-24-21		
CHECKED BY: PEH 02-26-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: SC-22.95
IN SERVICE: - -	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)	
PROPERTY NORFOLK SOUTHERN RY. CO.	PROFILE 2E	REV. 1
	CADD or DWG. No. SE6389P.009	SHEET 9

SIEMENS
Made in USA

SEAR III INTERNAL EVENT RECORDER

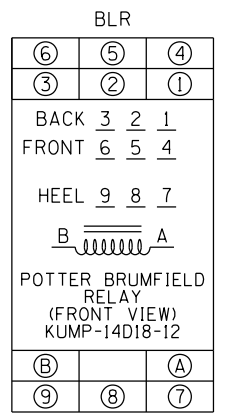
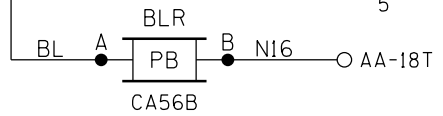
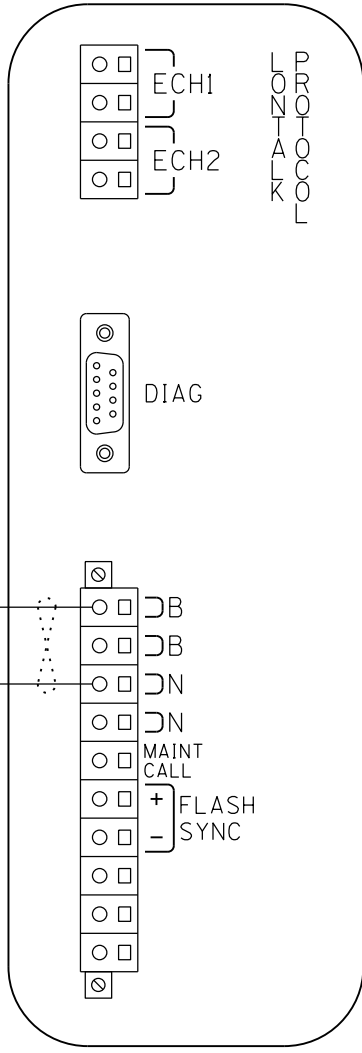
A80410



LOWER BAY

TO RADIO SHEET 12

TO SHEET 5



- NOTES:
1. ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.
 2. = TWIST

CPU MODULE & SEAR III HOOK-UP

DESIGNED BY: WJK 02-24-21		
DRAWN BY: XRL 02-24-21		
CHECKED BY: PEH 02-26-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: SC-22.95
IN SERVICE: - -	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)	
PROPERTY NORFOLK SOUTHERN RY CO.	PROFILE 2E	REV. 1
	CADD or DWG. No. SE6389P.010	SHEET 10 No.

SITE SET UP PROCEDURE	
FUNCTION	LED DISPLAY
SITE NAME	S-131 (N MAPLE ST.)
MILEPOST	SC-22.95
DOT NUMBER	721-470Y
TESTER TYPE	CROSSING
AUTO DST ADJUST	NO
TIMEZONE	OTHER
GMT OFFSET	-00:00
DATE FORMAT	MM-DD-YYYY
TEMP. FORMAT	FAHRENHEIT
INDICATE HOLDOFF (SEC)	0
INDICATE REFRESH (SEC)	60
GEO CTL REFRESH (SEC)	0
SITE ADDRESS (ATCS)	7.550.132.144.03.01
SITE TYPE	NO COMMUNICATION
# OFFICE ADDRESS (ATCS)	2.550.00.0000
# PRIMARY HOP ADDR	7.RRR.LLL.GGG.XX.XX
# BACKUP HOP ADDR 1	7.RRR.LLL.GGG.XX.XX
# BACKUP HOP ADDR 2	7.RRR.LLL.GGG.XX.XX
# POLL ID	1
# MODE	GEN/ATCS
# WAMS XID	DISABLED
# OFFICE COMM DEVICE	MCM (ECHELON)
# RADIO ATCS ADDR	7.RRR.LLL.GGG.01.01
# PHONE #	(OFFICE NUMBER)
# INIT STRING	
# FIELD COMM DEVICE	NONE
★ USER PORT BAUD	57600
★ USER PORT DATA BITS	8
★ USER PORT PARITY	NONE
★ USER PORT STOP BITS	1
★ USER PORT FLOW CONTROL	NONE
★ AUX PORT BAUD	9600
★ AUX PORT DATA BITS	8
★ AUX PORT PARITY	NONE
★ AUX PORT STOP BITS	1
★ AUX PORT FLOW CONTROL	NONE

CONTROL SYSTEM CONFIGURATION MENU QUESTIONS	
THE QUESTION	SELECT FROM MENU OPTION
RESET NAMES AND MODULES?	YES
RAILROAD NUMBER?	550
CROSSING CONFIGURATION?	NORMAL
AND1 USED AS XR?	YES
AND2 USED AS XR?	NO
AND3 USED AS XR?	NO
AND4 USED AS XR?	NO
AND5 USED AS XR?	NO
AND6 USED AS XR?	NO
AND7 USED AS XR?	NO
AND8 USED AS XR?	NO
* XR CONTROLLED BY FOREIGN RR?	NO
ENTRANCE GATES?	2
85% VOLTAGE RELAY OUT?	YES
BATTERY BANKS?	2
BATT MON USED?	NO
PREEMPTION?	NO
INTERNAL CROSSING CONTROLLERS?	2
EXTERNAL CROSSING CONTROLLERS?	0
VHF COMMUNICATOR?	NO
DTMF ACTIVATION?	NO
ILOD MODULES?	0
USE CELL MODEM NON-CRITICAL FEATURE?	NO


PROGRAM MENU QUESTIONS	PROGRAM
EDIT DIGITAL INPUTS	NO
EDIT BATTERIES	NO
EDIT RELAYS	NO
EDIT INDICATOR LEDS	NO
EDIT TEST LEDS	NO
GCP4K ATCS SUBNODE	16

TO CONFIGURE SEAR III PRESS SITE SETUP KEY.
USE ARROW KEYS TO MAKE SELECTION,
PRESS ENTER AFTER SELECTION HAS BEEN MADE.

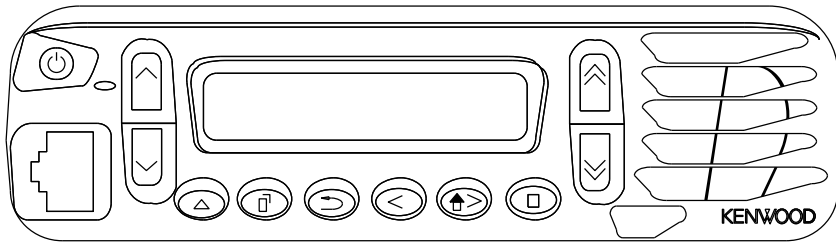
NOTES:

- # = NOT DISPLAYED IF SITE TYPE = NO COMMUNICATION
- ★ = USE DEFAULT SETTINGS
- * = ONLY DISPLAYED IF CROSSING CONFIGURATION = SPLIT GATE

SEAR III PROGRAMMING

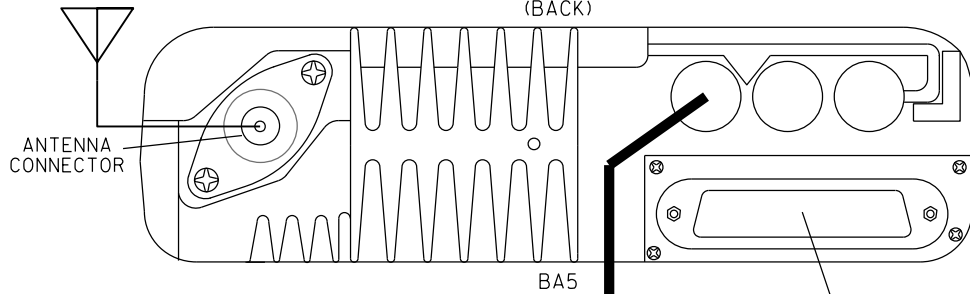
DESIGNED BY: WJK 02-24-21		
DRAWN BY: XRL 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: SC-22.95
CHECKED BY: PEH 02-26-21	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)	
IN SERVICE: - -	PROFILE 2E	REV. 1
PROPERTY NORFOLK SOUTHERN RWY CO.	CADD or DWG. No. SE6389P.011	SHEET No. 11

(FRONT)



KENWOOD RADIO NX-700H
OR EQUIVALENT

(BACK)



ANTENNA
CONNECTOR

BA5

DB25M - DB25M
STRAIGHT THROUGH CABLE } TO
SEAR III
SHEET 10

CABLE - KENWOOD
P/N E30-7520-15

AA-2B O B12
AA-7B O N12
B12
N12

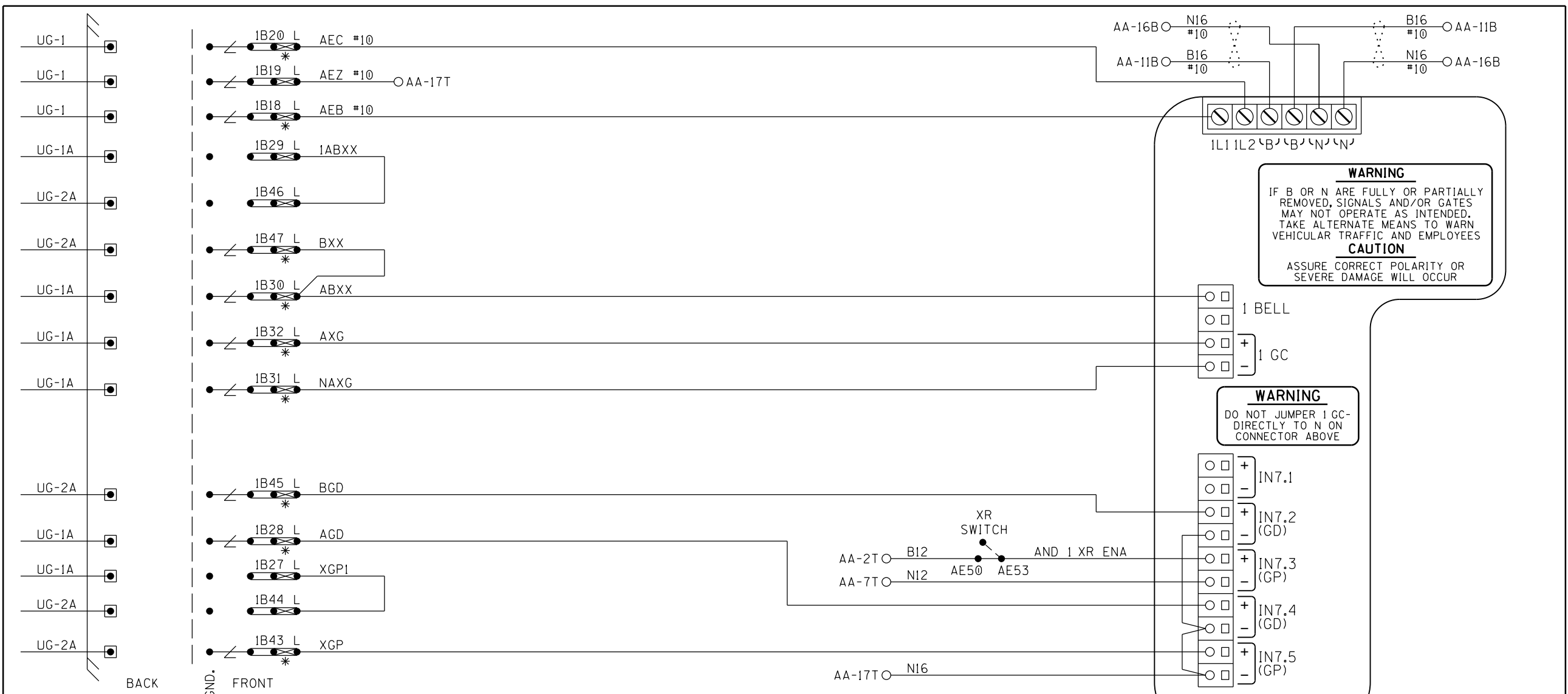


BB5

NOTE:
1. ALL WIRING TO BE #10AWG UNLESS
NOTED OTHERWISE.

BACKHAUL EQUIPMENT

DESIGNED BY: WJK 02-24-21		
DRAWN BY: XRL 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: SC-22.95
CHECKED BY: PEH 02-26-21	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)	
IN SERVICE: - -	PROFILE 2E	REV. 1
PROPERTY NORFOLK SOUTHERN RWY CO.	CADD or DWG. No. SE6389P.012	SHEET No. 12



WARNING
 IF B OR N ARE FULLY OR PARTIALLY REMOVED, SIGNALS AND/OR GATES MAY NOT OPERATE AS INTENDED. TAKE ALTERNATE MEANS TO WARN VEHICULAR TRAFFIC AND EMPLOYEES
CAUTION
 ASSURE CORRECT POLARITY OR SEVERE DAMAGE WILL OCCUR

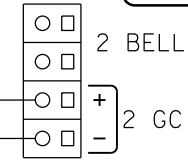
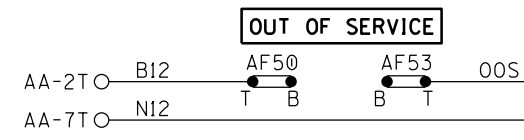
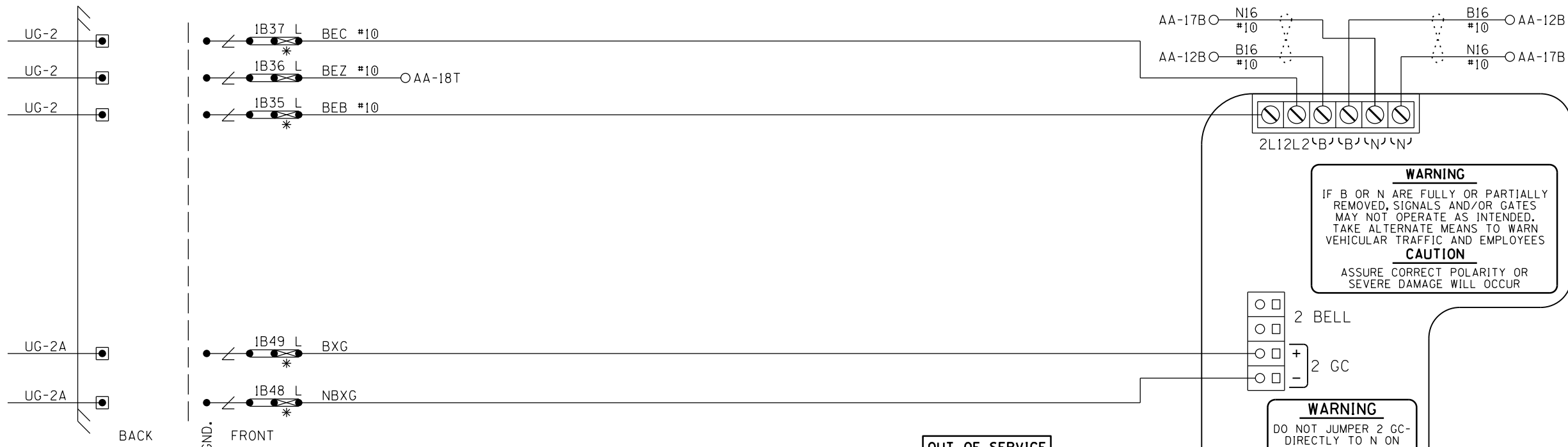
WARNING
 DO NOT JUMPER 1 GC-DIRECTLY TO N ON CONNECTOR ABOVE

- NOTES:
1. ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.
 2. * = TEST LINKS MUST BE OPENED TEMPORARILY FOR COLD START OF NEW OR REPLACEMENT SSSC MODULE AND CAN ONLY BE CLOSED IN SEQUENCE WITH MFR. INSTRUCTION; APPENDIX C OF GCP 4000 REFERENCE MANUAL.

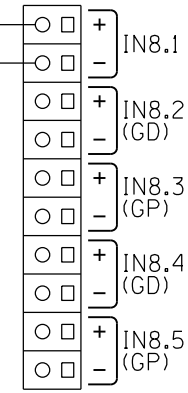
3. = TWIST

SSSC#1 MODULE HOOK-UP

DESIGNED BY: WJK 02-24-21		
DRAWN BY: XRL 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: SC-22.95
CHECKED BY: PEH 02-26-21	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)	
IN SERVICE: - -	PROFILE 2E	REV. 1
PROPERTY NORFOLK SOUTHERN RYW CO.	CADD or DWG. No. SE6389P.013	SHEET No. 13



WARNING
DO NOT JUMPER 2 GC-DIRECTLY TO N ON CONNECTOR ABOVE

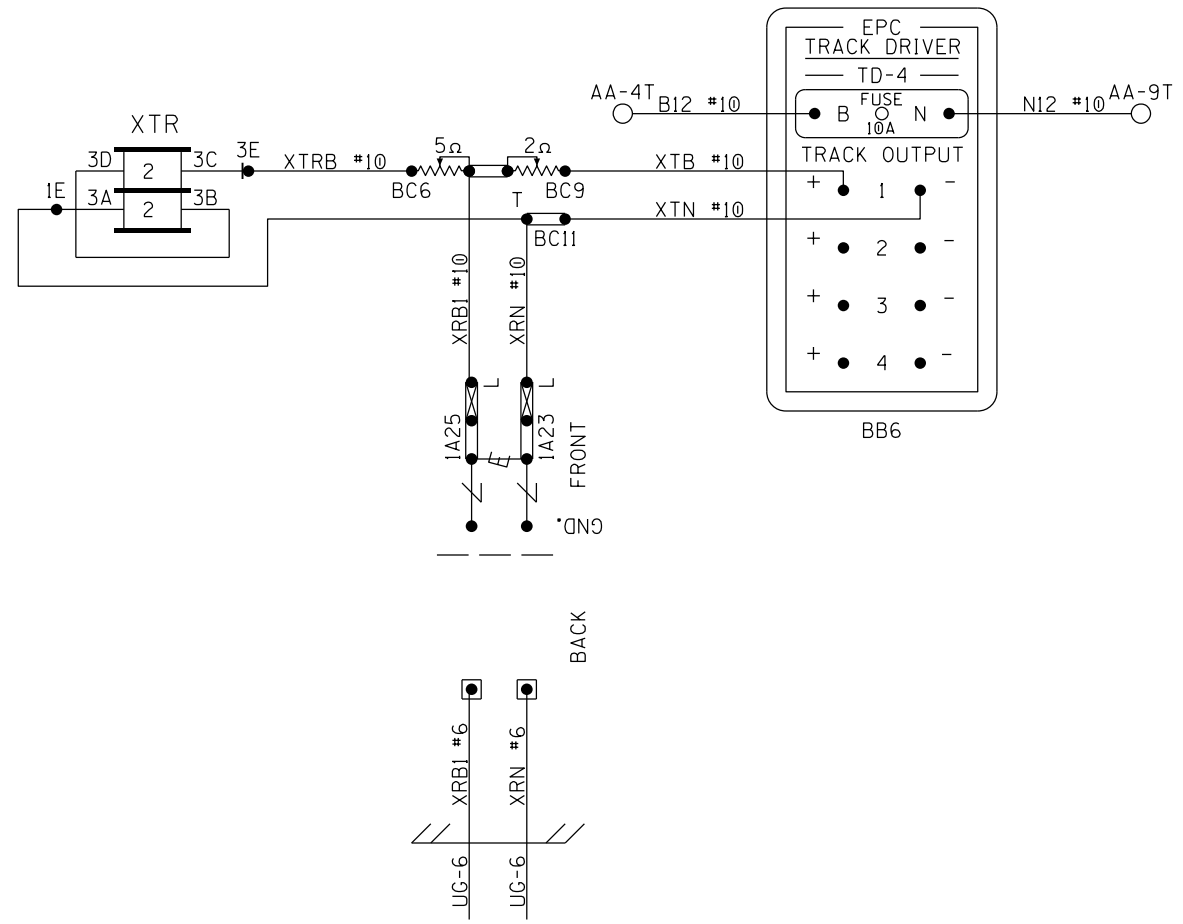


A80405
SSCC-2

SSCC#2 MODULE HOOK-UP

- NOTES:
1. ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.
 2. * = TEST LINKS MUST BE OPENED TEMPORARILY FOR COLD START OF NEW OR REPLACEMENT SSCC MODULE AND CAN ONLY BE CLOSED IN SEQUENCE WITH MFR. INSTRUCTION; APPENDIX C OF GCP 4000 REFERENCE MANUAL.
 3. = TWIST

DESIGNED BY: WJK 02-24-21		
DRAWN BY: XRL 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: SC-22.95
CHECKED BY: PEH 02-26-21	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)	
IN SERVICE: - -	PROFILE 2E	REV. 1
PROPERTY NORFOLK SOUTHERN RY CO.	CADD or DWG. No. SE6389P.014	SHEET No. 14

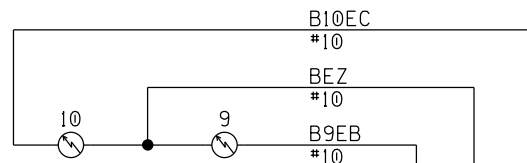


TD-4, XTR

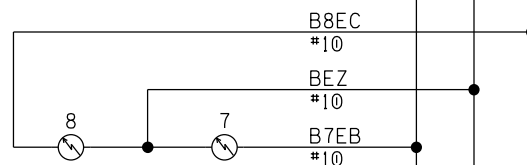
DESIGNED BY:			
WJK 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	SC-22.95
DRAWN BY:	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)		
XRL 02-24-21			
CHECKED BY:	PROFILE 2E	REV.	1
PEH 02-26-21	CADD or DWG. No.	SE6389P.015	SHEET No. 15

PROPERTY
NORFOLK SOUTHERN RY CO.

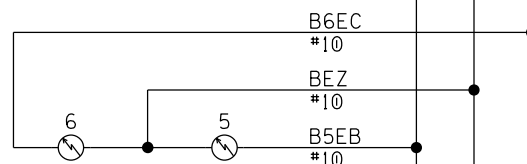
"B" TIP FLASHING SIDELIGHTS



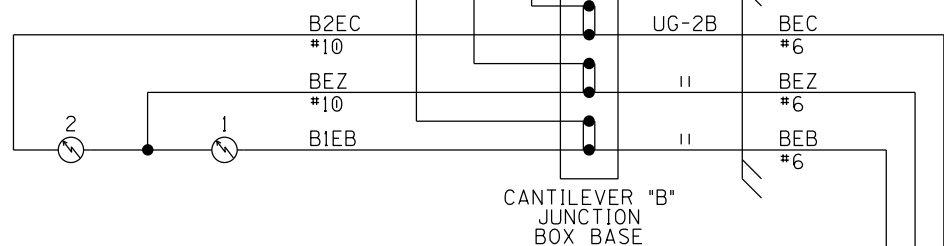
"B" TIP FLASHING LIGHTS (BACK)




"B" TIP FLASHING LIGHTS (FRONT)



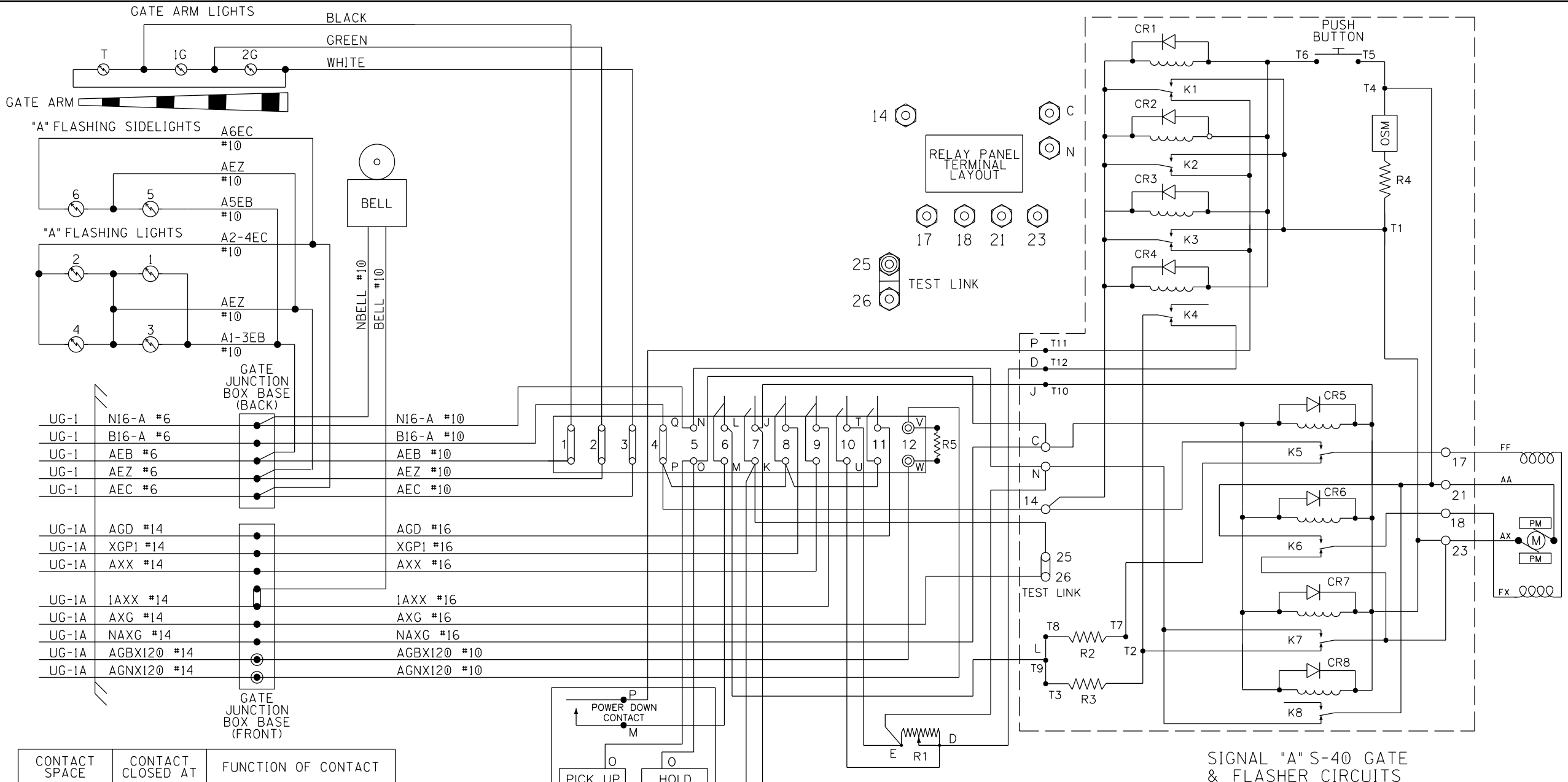
"B" CANTILEVER MAST FLASHING LIGHTS



CANTILEVER FLASHER LIGHTS

DESIGNED BY:	 NORFOLK SOUTHERN		
WJK 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	SC-22.95
DRAWN BY:	SUMMERVILLE, SC		
XRL 02-24-21	CFLGS AT S-131 (N MAPLE ST.)		
CHECKED BY:	PROFILE 2E	REV.	1
PEH 02-26-21	CADD or DWG. No.	SE6389P.016	SHEET No. 16

PROPERTY
NORFOLK SOUTHERN RY CO.

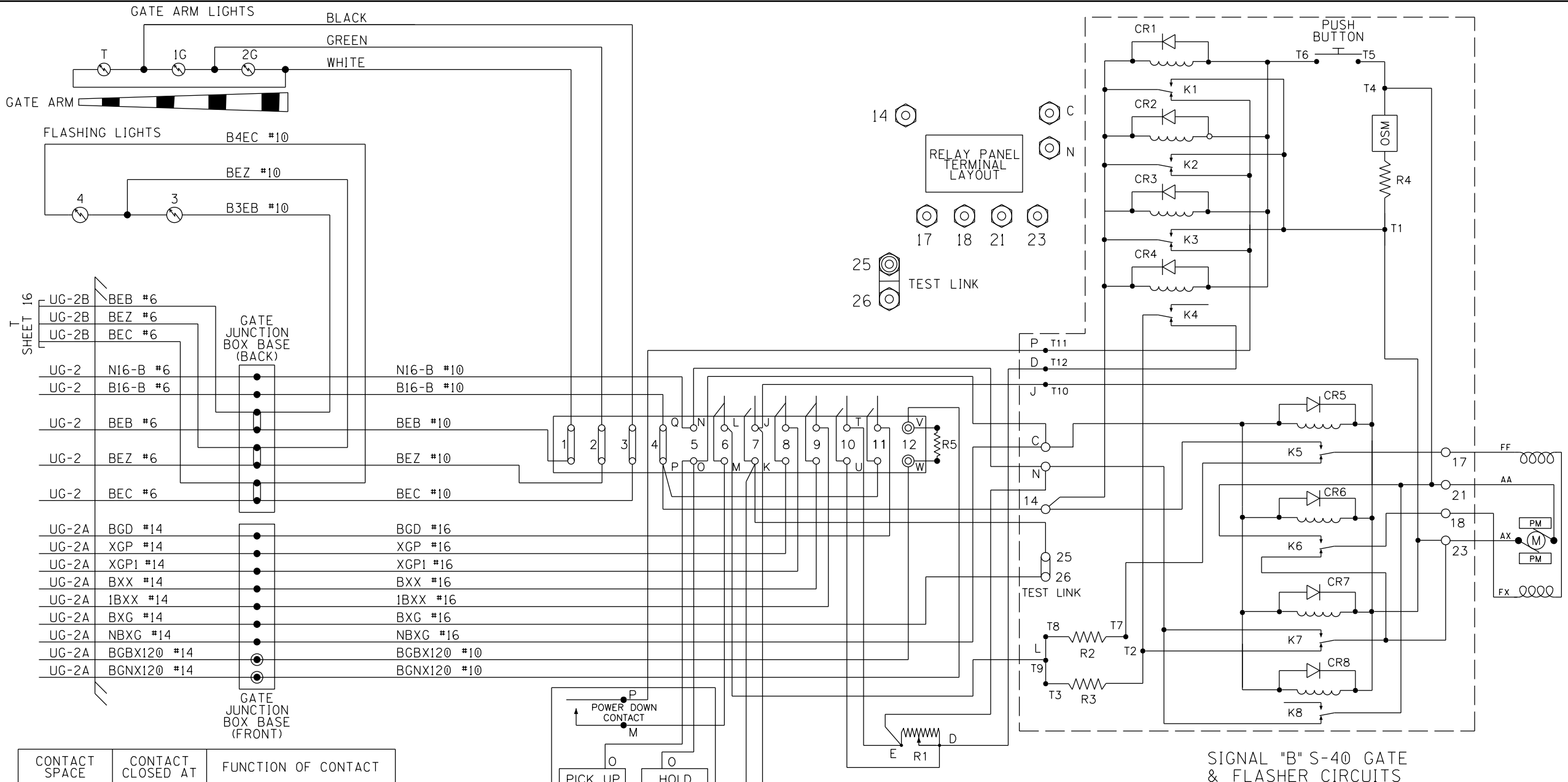


CONTACT SPACE	CONTACT CLOSED AT	FUNCTION OF CONTACT
(6) L-M	45° - 90°	POWER DOWN CONTROL
(7) J-K	0° - 89°	POWER UP CONTROL
(8)	83° - 90°	FLASHING LGT. CONTROL
(9)	5° - 90°	BELL CONTROL
(10) T-U	0° - 5°	HORIZONTAL SNUB
(11)	0° - 5°	GATE DOWN INDICATION

R1 - DOWN SNUB RESISTOR, ADJ.
 R2 - POWER DOWN RATE RESISTOR
 R3 - POWER DOWN LIMIT RESISTOR
 R4 - OSM SNUB RESISTOR
 R5 - DEFROSTER
 K1-8 - GATE & MAINT. RELAYS
 OSM - OVERSPEED MODULE

SIGNAL "A" S-40 GATE & FLASHER CIRCUITS

DESIGNED BY: WJK 02-24-21		
DRAWN BY: XRL 02-24-21		
CHECKED BY: PEH 02-26-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: SC-22.95
IN SERVICE: - -	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)	
PROPERTY NORFOLK SOUTHERN RYW CO.	PROFILE 2E	REV. 1
	CADD or DWG. No. SE6389P.017	SHEET 17



SHEET 16

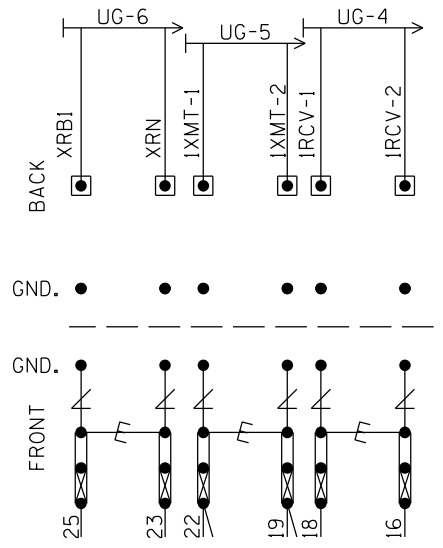
UG-2B	BEB #6	GATE JUNCTION BOX BASE (BACK)	N16-B #10
UG-2B	BEZ #6		B16-B #10
UG-2B	BEC #6		
UG-2	N16-B #6		BEB #10
UG-2	B16-B #6		BEZ #10
UG-2	BEB #6		BEC #10
UG-2	BEZ #6		
UG-2	BEC #6		
UG-2A	BGD #14	GATE JUNCTION BOX BASE (FRONT)	BGD #16
UG-2A	XGP #14		XGP #16
UG-2A	XGP1 #14		XGP1 #16
UG-2A	BXX #14		BXX #16
UG-2A	1BXX #14		1BXX #16
UG-2A	BXG #14		BXG #16
UG-2A	NBXG #14		NBXG #16
UG-2A	BGBX120 #14		BGBX120 #10
UG-2A	BGNX120 #14	BGNX120 #10	

CONTACT SPACE	CONTACT CLOSED AT	FUNCTION OF CONTACT
(6) L-M	45° - 90°	POWER DOWN CONTROL
(7) J-K	0° - 89°	POWER UP CONTROL
(8)	83° - 90°	FLASHING LGT. CONTROL
(9)	5° - 90°	BELL CONTROL
(10) T-U	0° - 5°	HORIZONTAL SNUB
(11)	0° - 5°	GATE DOWN INDICATION

R1 - DOWN SNUB RESISTOR, ADJ.
 R2 - POWER DOWN RATE RESISTOR
 R3 - POWER DOWN LIMIT RESISTOR
 R4 - OSM SNUB RESISTOR
 R5 - DEFROSTER
 K1-8 - GATE & MAINT. RELAYS
 OSM - OVERSPEED MODULE

DESIGNED BY: WJK 02-24-21		
DRAWN BY: XRL 02-24-21		
CHECKED BY: PEH 02-26-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: SC-22.95
IN SERVICE: - -	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)	
PROPERTY NORFOLK SOUTHERN RWY CO.	PROFILE 2E	REV. 1
	CADD or DWG. No. SE6389P.018	SHEET 18

"1A"



NOTES:

1. = HEAVY DUTY EQUALIZER (022700-1X)
2. = ERICO LIGHTNING ARRESTER (EPD2050F)
3. GND. ● = THROUGH GROUND POST ON EACH TERMINAL BLOCK TO FARADAY SHIELD
4. = TEST LINK
5. INSTALL TEST LINKS ON ALL TRACK WIRES AND ON ALL LOW VOLTAGE UNDERGROUND CABLE TERMINATIONS.

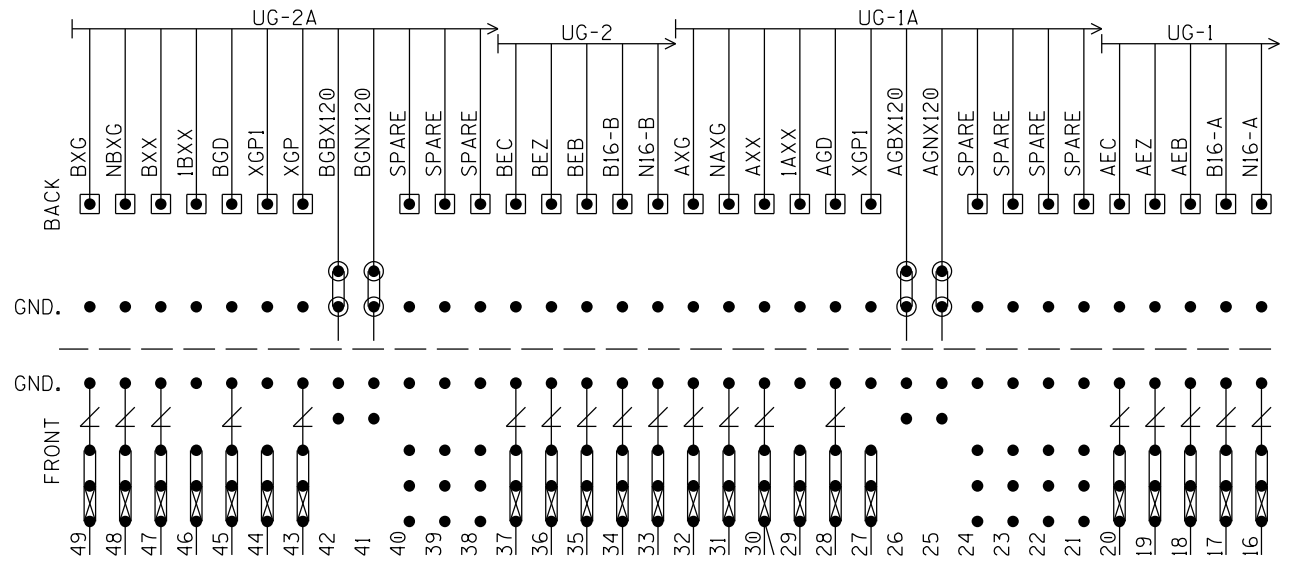
SEE FARADAY SHIELD SHOP DRAWING DETAIL FOR HOW THIS PORTION OF THE FARADAY SHIELD IS PREDRILLED. ONLY INSTALL AND USE THE TERMINALS NEEDED.

BACKBOARD 1A

DESIGNED BY:			
WJK 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.		M.P.: SC-22.95
DRAWN BY:	SUMMERVILLE, SC		
XRL 02-24-21	CFLGS AT S-131 (N MAPLE ST.)		
CHECKED BY:	PROFILE 2E		REV. 1
PEH 02-26-21	CADD or DWG. No. SE6389P.019		SHEET 19
IN SERVICE:			

PROPERTY
NORFOLK SOUTHERN RY CO.

"1B"



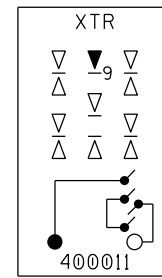
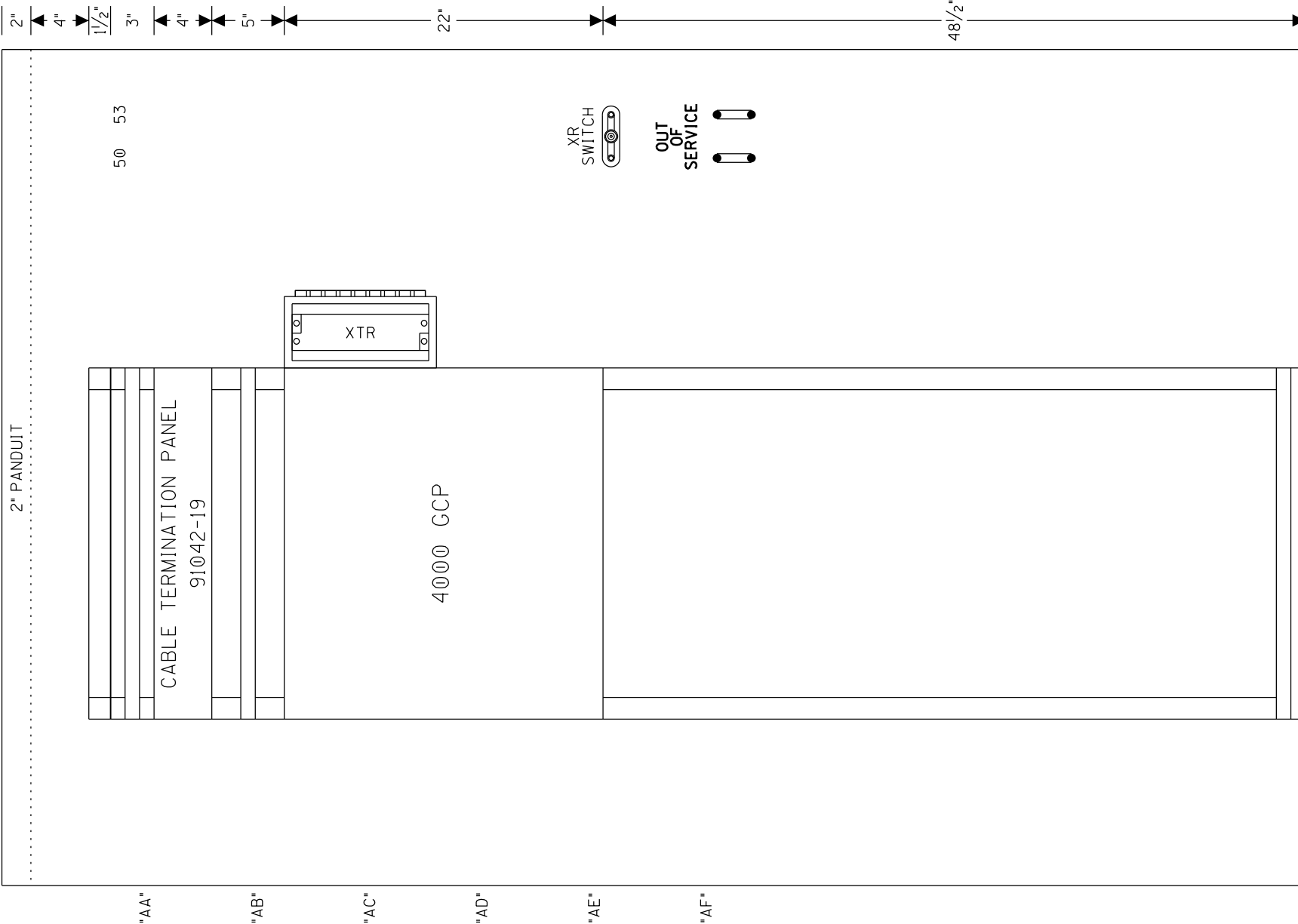
SEE FARADAY SHIELD SHOP DRAWING DETAIL FOR HOW THIS PORTION OF THE FARADAY SHIELD IS PREDRILLED. ONLY INSTALL AND USE THE TERMINALS NEEDED.

NOTES:

1. GND. ● = THROUGH GROUND POST ON EACH TERMINAL BLOCK TO FARADAY SHIELD
2. * = TEST LINKS MUST BE OPENED
3. ● = INSULATED NUTS TO BE USED ON ALL 120VAC AND ABOVE TERMINALS

BACKBOARD 1B

DESIGNED BY:			
WJK 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.		M.P.: SC-22.95
DRAWN BY:	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)		
XRL 02-24-21	PROFILE 2E		REV. 1
CHECKED BY:	CADD or DWG. No. SE6389P.020		
PEH 02-26-21	IN SERVICE:		SHEET No. 20
PROPERTY	NORFOLK SOUTHERN RYW CO.		



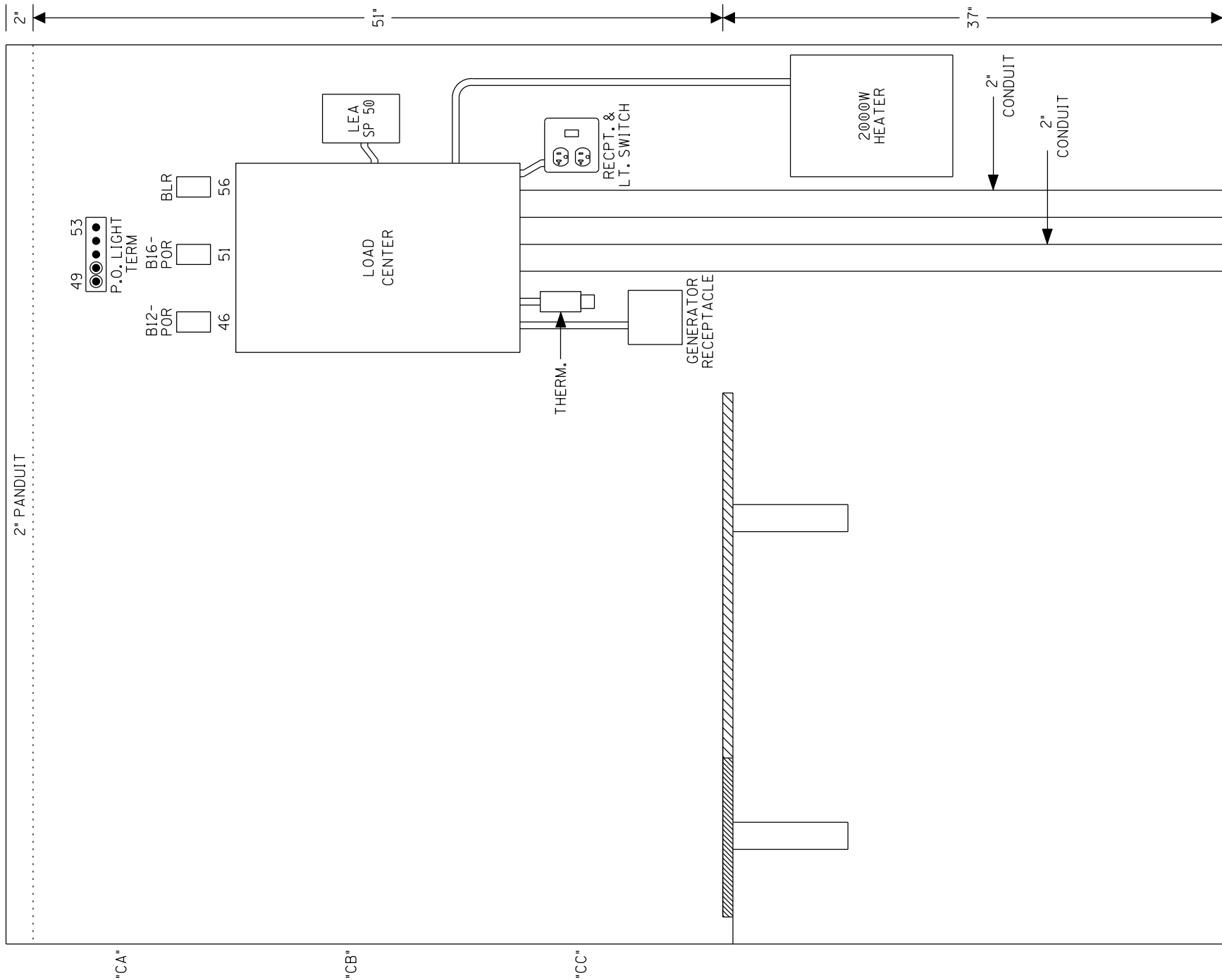
SAFETRAN ALSTOM (GRS) RELAY
 CROSS REFERENCE LIST
 SAFETRAN ALSTOM (GRS)
 400011 - A62-276

24 1/4"
 EQUIPMENT RACK #1
 FRONT



SIDE A LAYOUT & RACK PLACEMENT

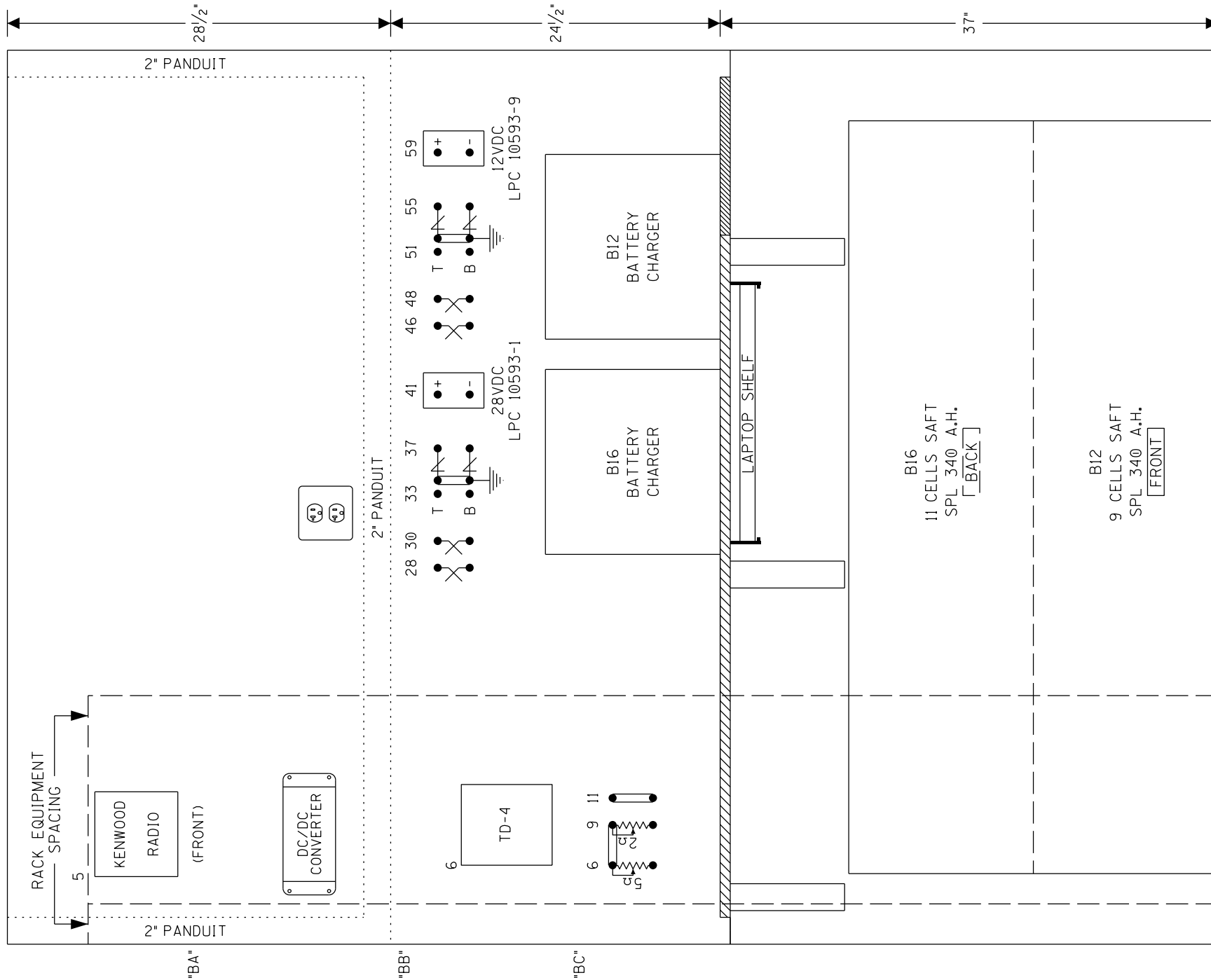
DESIGNED BY: WJK 02-24-21		
DRAWN BY: XRL 02-24-21		
CHECKED BY: PEH 02-26-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: SC-22.95
IN SERVICE: - -	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)	
PROPERTY NORFOLK SOUTHERN RYW CO.	PROFILE 2E	REV. 1
	CADD or DWG. No. SE6389P.021	SHEET No. 21



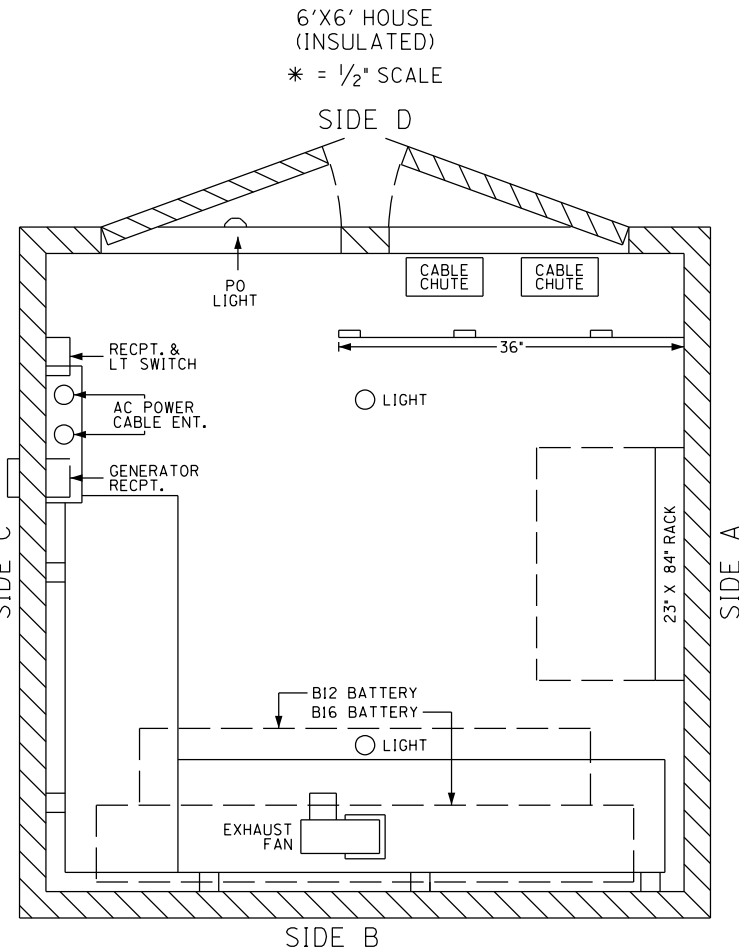
SIDE C LAYOUT

DESIGNED BY: WJK 02-24-21	NS NORFOLK SOUTHERN	
DRAWN BY: XRL 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: SC-22.95
CHECKED BY: PEH 02-26-21	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)	
IN SERVICE: - -	PROFILE 2E	REV. 1
	CADD or DWG. No. SE6389P.022	SHEET No. 22

PROPERTY
NORFOLK SOUTHERN RY CO.



***TOP VIEW**



SIDE B LAYOUT & TOP VIEW

DESIGNED BY: WJK 02-24-21	NS NORFOLK SOUTHERN	
DRAWN BY: XRL 02-24-21	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: SC-22.95
CHECKED BY: PEH 02-26-21	SUMMERVILLE, SC CFLGS AT S-131 (N MAPLE ST.)	
IN SERVICE: - -	PROFILE 2E	REV. 1
	CADD or DWG. No. SE6389P.023	SHEET No. 23

PROPERTY
NORFOLK SOUTHERN RYW CO.

Attachment F – Norfolk Southern Checklist for Construction

Norfolk Southern Check List for Construction

* to be completed prior to the start of any work on Norfolk Southern right-of-way

Norfolk Southern Milepost/File #: _____

Sponsor/DOT File #: _____

Norfolk Southern Public Improvement Contact: _____

1. Has contractor reviewed and agreed to be in compliance with the latest **Special Provisions for the Protection of Railway Interests**?
2. Has **Insurance** been approved by Norfolk Southern Risk Management Department
| NSRISK3@NSCORP.COM Date Approved: _____
3. Has a **Pre-Construction Meeting** been scheduled with a Norfolk Southern representative?
Scheduled Date: _____
4. Has a **Contractor Right-of-Entry** been executed by contractor and Norfolk Southern? Date Fully Executed: _____
5. Has a written **Authorization to Proceed** been issued by a Norfolk Southern representative?
Date Issued _____
6. Has a **Flagman** been assigned? Name/Phone # _____

Signed by DOT Representative Date Signed by Contractor Date

Signed by NS Representative Date

Attachment G – Permits

Mayor
Ricky Waring

Councilmembers:
Bill McIntosh, Mayor Pro Tem
Russ Touchberry
Aaron Brown
Kima Garten-Schmidt
Bob Jackson
Terry Jenkins



Town Administrator
Lisa Wallace

Town Clerk
Beth Messervy

Town Attorney
G.W. Parker

TOWN of SUMMERVILLE

September 23, 2022

C-SWPPP PREPARER:
Shanna Niswonger, PE
Michael Baker International, Inc.
700 Huger Street
Columbia, South Carolina 29201
sniswonger@mbakerintl.com

PERMITTEE:
Town of Summerville
Attn: Russ Cornette, PE
200 South Main Street
Summerville, South Carolina 29483
rcornette@summervillesc.gov

**RE: MS4 Project Approval
North Maple Street
Disturbed Area: 17.4 Acres
Stormwater Construction Approval #: SCA22-000001**

Dear Ms. Niswonger and Mr. Cornette:

This letter is for the purpose of approving the project listed above consisting of construction drawings and the Stormwater Management Design Study, both signed and dated through January 4, 2022. The drainage improvements and erosion and sediment control features are consistent with the Town of Summerville's ordinance and comply with the SC Department of Transportation's Requirements for Hydraulic Design Studies. Land disturbing activities may not commence until all applicable state and federal approvals are obtained, including SCDHEC issuing coverage under the NPDES Construction General Permit (CGP). A copy of the approved set of plans shall be maintained on site while construction is underway. Should you have any questions, please contact me at (843) 851-4235.

Sincerely,

A handwritten signature in blue ink that reads "Bonnie Miley".

Bonnie C. Miley, PE
Assistant Town Engineer

Enclosure: Approved MS4 Application

CC: Mallory Ware—SCDHEC Coastal Stormwater Permitting
Amanda Y. Deaton, PE—Michael Baker International, Inc.



STORMWATER CONSTRUCTION APPROVAL APPLICATION

(Applicable for single family homes that disturb one (1) acre or more and commercial, industrial, or major subdivisions that disturb one-half (0.5) acres or more)

APPROVED FOR CONSTRUCTION
Town of Summerville
Engineering Department

By: Bonnie M. G.

Date: 9/23/2022

Permit # SCA22-000001

DATE: 09/24/2021

PROJECT/SITE NAME: North Maple Street

I. Project Information

Project Owner/ Operator (Company or person): Town of Summerville
Contact Person: Russell Cornette, PE Company EIN: 57-6001110
Mailing Address: 200 S. Main Street
City: Summerville State: SC Zip: 29483
Phone: (Day) (843) 851-4226 (Mobile) _____ (Fax) _____
Email address: RCornette@summervillesc.gov

Person Financially Responsible: _____
(If different than above, a person must be named in both spaces)
Mailing Address: _____
City: _____ State: _____ Zip: _____
Phone: (Day) _____ (Mobile) _____ (Fax) _____
Email address: _____

Agent or Contact Person (if applicable): _____
Mailing Address: _____
City: _____ State: _____ Zip: _____
Email address: _____

Engineer, Technical Representative or Firm: Michael Baker International, Inc. - Shanna Niswonger, PE
(If different from Agent)
Mailing Address: 700 Huger Street
City: Columbia State: SC Zip: 29201
Phone: (Day) (803) 231-3996 (Mobile) _____ (Fax) _____
Email address: sniswonger@mbakerintl.com

II. Property Information

A. Site Location (street address, nearest intersection, etc.): North Maple Street from Parsons Rd to approx 760' S of Old Dairy
City/ Town: Town of Summerville Latitude: 33° 02' 03" N Longitude: 80° 11' 19" W
Tax map # (list all): Linear Project - Town of Summerville's Right-of-Way

B. Property Owner (if different from section I above): _____
Mailing Address: _____
City: _____ State: _____ Zip: _____
Phone: (Day) _____

III. Site Information

A. Disturbed area (to the nearest tenth of an acre): 17.4 Total area: 19.4
Impervious area: 10.0

B. Is this project part of a Larger Common Plan for Development or Sale (LCP)? Yes No
If yes, what is the previous state permit no.? _____
Previous NPDES number: SCR10
LCP/ Overall Development Name: _____



STORMWATER CONSTRUCTION APPROVAL APPLICATION

C. Start Date (MM/DD/YYYY): 09/01/2020 Completion Date: 09/01/2025 (estimated)

D. Type of Activity (check all that apply):

- Commercial Residential: Single-family Linear (Roads, utility lines, etc.)
 Institutional Residential: Multi-family Site Preparation (No new impervious)
 Re-development Other: _____

IV. Waterbody Information

A. Nearest receiving waterbody(s): Unnamed Tributaries (north&south) Distance to this waterbody (feet): 2500
 Next/Nearest named receiving waterbody(s): Rumphs Hill Creek (north), Sawmill Branch (south)

B. Wetlands/ Waters of the State

Waters of the U.S./ State	On the site?	If yes, delineated/ identified?	Impacts?	Amount of impacts
a. Jurisdictional wetlands	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<u>0.30</u> Ac <u> </u> Feet
b. Non-jurisdictional wetlands	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<u> </u> Ac <u> </u> Feet
c. Other (List): <u>Jurisdictional Stream</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<u>0.01</u> Ac <u>134</u> Feet

1. If yes for delineation, has documentation of the delineation from the USACOE been provided?
 Yes No N/A
2. If yes for impacts, has a USACOE permit been applied for or obtained for those impacts?
 Yes No N/A If yes, provide copy of the approved USACOE permit. SAC-2018-01003

C. Special Protection Areas

1. Are there any known flooding problems downstream of or adjacent to this site? Yes No
 If yes, see attached instruction.
2. Are any portions of the site located in a designated floodplain? Yes No If yes, which zone? _____
 If yes, what are the FIRM Numbers? _____
3. List the nearest DHEC water quality monitoring station(s) [WQMS(s)] to which stormwater (SW) discharges will drain: CSTL-102, CSTL-013 Waterbody(s): Ashley River, Sawmill Branch
- 3.1. Is this WQMS listed on the most current 303(d) List for Impaired Waters? Yes No
- a. If yes for (3.1), list the impairment(s). ENTERO and ECOLI(102), DO & FC (013)
- b. If yes for (3.1), will construction SW discharges from your site contain the pollutant(s) of impairment?
 Yes No
- c. If yes for (b), will use of the proposed BMPs ensure that the site's discharges will not contribute to or cause further water quality standard violations? Yes No
- 3.2. Has a TMDL(s) been developed? Yes No
- a. If yes for (3.2), list the waterbody: Ashley River
 list the impairment(s): DO
- b. Has the standard been attained for the impairment(s)? Yes No
- c. If no for (b), will construction SW discharges from your site contain the pollutant of impairment?
 Yes No
- d. If yes for (c), are your discharges consistent with the assumptions and requirements of the TMDL(s)?
 Yes No
- e. If no for (d), will use of selected BMPs ensure that the site's discharges will not contribute to or cause further water quality standard violations? Yes No



STORMWATER CONSTRUCTION APPROVAL APPLICATION

V. Preparer/Operator Information


A. Plan Preparer: Shanna Niswonger, PE S.C. Registration #: 28678
 Company/ Firm: Michael Baker International S.C. COA #: 673
 Mailing Address: 700 Huger Street
 City: Columbia State: SC Zip: 29201
 Phone: (Day) (803) 231-3996 (Mobile) _____ (Fax) _____
 Email address: sniswonger@mbakerintl.com

B. Operator of Day-to-Day Site Activities (Company or person): _____
 Site Contact (if ODSA is company): _____
 Mailing Address: _____
 City: _____ State: _____ Zip: _____
 Phone: (Day) _____ (Mobile) _____ (Fax) _____
 Email address: _____

VI. Signatures and Certifications

A. One copy of the stormwater plan, all specifications and supporting calculations, forms, and reports are herewith submitted and made a part of this application. I have placed my signature and seal on the design documents submitted signifying that I accept responsibility for the design of the system. Further, I certify to the best of my knowledge and belief that the design is consistent with the requirements of the Town of Summerville Stormwater Management Ordinance and the Stormwater Management Design Manual. (This should be the person identified in Section V.A.)
 Please check one.

Shanna D. Niswonger, PE
 Printed name of Plan Preparer


 Digitally signed by Shanna D. Niswonger
 Date: 2021.09.27 16:48:06 -04'00'
 Signature of Plan Preparer

28678
 S.C. Registration Number

B. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I hereby certify that all construction and associated activity pertaining to this site shall be accomplished pursuant to and in keeping with the terms and conditions of the approved plans. I also certify that a responsible person will be assigned to the project for day-to-day control. I hereby grant authorization to the Town of Summerville Engineering Department the right of access to the site at all times for the purpose of on site inspections during the course of construction and to perform maintenance inspections following the completion of the land-disturbing activity.

Russell Cornette, PE
 Printed name of Owner/Operator


 Signature of Project Owner/ Operator

PW Director
 Title/ Position

C. Designer Certification-One copy of the plans, all specifications and supporting calculations, forms, and reports are herewith submitted and made a part of this application. One copy of the plans, all specifications and supporting calculations, forms, and reports shall be submitted upon approval. 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 Town of Summerville Stormwater Management Ordinance and the Design Manual.


 Digitally signed by Shanna D. Niswonger
 Date: 2021.09.27 16:54:16 -04'00'

Signature

28678

S.C. Registration Number