STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH, N.C.

CONTRACT BONDS

FOR CONTRACT NO. C204397

WBS <u>34400.3.4 STATE FUNDED</u>

T.I.P NO. R-2233BB

COUNTY OF <u>RUTHERFORD</u>

THIS IS THE <u>ROADWAY & STRUCTURE</u> CONTRACT

ROUTE NUMBER US 221 LENGTH 5.164 MILES

LOCATION <u>US-221 SOUTH OF US-74 BUS (CHARLOTTE RD) TO NORTH OF</u>

SR-1366 (ROPER LOOP RD).

CONTRACTOR WRIGHT BROTHERS CONSTRUCTION COMPANY INC

ADDRESS P.O. BOX 437

CHARLESTON, TN 37310

BIDS OPENED DECEMBER 21, 2021 01/20/2022 CONTRACT EXECUTION

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH, N.C.

PROPOSAL

INCLUDES ADDENDUM No. 3 DATED 12-14-2021

DATE AND TIME OF BID OPENING: DECEMBER 21, 2021 AT 2:00 PM

CONTRACT ID C204397 WBS 34400.3.4

FEDERAL-AID NO. STATE FUNDED

COUNTY RUTHERFORD

T.I.P. NO. R-2233BB

MILES 5.164 ROUTE NO. US 221

LOCATION US-221 SOUTH OF US-74 BUS (CHARLOTTE RD) TO NORTH OF

SR-1366 (ROPER LOOP RD).

TYPE OF WORK GRADING, DRAINAGE, PAVING, SIGNALS, AND STRUCTURES.

NOTICE:

ALL BIDDERS SHALL COMPLY WITH ALL APPLICABLE LAWS REGULATING THE PRACTICE OF GENERAL CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA WHICH REQUIRES THE BIDDER TO BE LICENSED BY THE N.C. LICENSING BOARD FOR CONTRACTORS WHEN BIDDING ON ANY NON-FEDERAL AID PROJECT WHERE THE BID IS \$30,000 OR MORE, EXCEPT FOR CERTAIN SPECIALTY WORK AS DETERMINED BY THE LICENSING BOARD. BIDDERS SHALL ALSO COMPLY WITH ALL OTHER APPLICABLE LAWS REGULATING THE PRACTICES OF ELECTRICAL, PLUMBING, HEATING AND AIR CONDITIONING AND REFRIGERATION CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA. NOTWITHSTANDING THESE LIMITATIONS ON BIDDING, THE BIDDER WHO IS AWARDED ANY FEDERAL - AID FUNDED PROJECT SHALL COMPLY WITH CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA FOR LICENSING REQUIREMENTS WITHIN 60 CALENDAR DAYS OF BID OPENING.

BIDS WILL BE RECEIVED AS SHOWN BELOW:

THIS IS A ROADWAY & STRUCTURE PROPOSAL

5% BID BOND OR BID DEPOSIT REQUIRED

PROPOSAL FOR THE CONSTRUCTION OF CONTRACT No. C204397 IN RUTHERFORD COUNTY, NORTH CAROLINA

Date	20
DEPARTM	ENT OF TRANSPORTATION,
RALE	IGH, NORTH CAROLINA

The Bidder has carefully examined the location of the proposed work to be known as Contract No. C204397 has carefully examined the plans and specifications, which are acknowledged to be part of the proposal, the special provisions, the proposal, the form of contract, and the forms of contract payment bond and contract performance bond; and thoroughly understands the stipulations, requirements and provisions. The undersigned bidder agrees to bound upon his execution of the bid and subsequent award to him by the Board of Transportation in accordance with this proposal to provide the necessary contract payment bond and contract performance bond within fourteen days after the written notice of award is received by him. The undersigned Bidder further agrees to provide all necessary machinery, tools, labor, and other means of construction; and to do all the work and to furnish all materials, except as otherwise noted, necessary to perform and complete the said contract in accordance with the 2018 Standard Specifications for Roads and Structures by the dates(s) specified in the Project Special Provisions and in accordance with the requirements of the Engineer, and at the unit or lump sum prices, as the case may be, for the various items given on the sheets contained herein.

The Bidder shall provide and furnish all the materials, machinery, implements, appliances and tools, and perform the work and required labor to construct and complete State Highway Contract No. C204397 in Rutherford County, for the unit or lump sum prices, as the case may be, bid by the Bidder in his bid and according to the proposal, plans, and specifications prepared by said Department, which proposal, plans, and specifications show the details covering this project, and hereby become a part of this contract.

The published volume entitled North Carolina Department of Transportation, Raleigh, Standard Specifications for Roads and Structures, January 2018 with all amendments and supplements thereto, is by reference incorporated into and made a part of this contract; that, except as herein modified, all the construction and work included in this contract is to be done in accordance with the specifications contained in said volume, and amendments and supplements thereto, under the direction of the Engineer.

If the proposal is accepted and the award is made, the contract is valid only when signed either by the Contract Officer or such other person as may be designated by the Secretary to sign for the Department of Transportation. The conditions and provisions herein cannot be changed except over the signature of the said Contract Officer.

The quantities shown in the itemized proposal for the project are considered to be approximate only and are given as the basis for comparison of bids. The Department of Transportation may increase or decrease the quantity of any item or portion of the work as may be deemed necessary or expedient.

An increase or decrease in the quantity of an item will not be regarded as sufficient ground for an increase or decrease in the unit prices, nor in the time allowed for the completion of the work, except as provided for the contract.

Accompanying this bid is a bid bond secured by a corporate surety, or certified check payable to the order of the Department of Transportation, for five percent of the total bid price, which deposit is to be forfeited as liquidated damages in case this bid is accepted and the Bidder shall fail to provide the required payment and performance bonds with the Department of Transportation, under the condition of this proposal, within 14 calendar days after the written notice of award is received by him, as provided in the Standard Specifications; otherwise said deposit will be returned to the Bidder.

POLICE TON DAVENTO

State Contract Officer

— Docusigned by: Ronald E. Davenport, Jr.

Dec 14, 2021

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PROJECT SPECIAL PROVISIONS

GENERAL

CONTRACT TIME AND LIQUIDATED DAMAGES:

(8-15-00) (Rev. 12-18-07) 108 SP1 G07 A

The date of availability for this contract is February 1, 2022, except -Y16-, -Y17-, -Y19-, -Y25EXT-, -Y25REV- and -L3- (from Sta. 941+00 +/- to the end of the project) is January 1, 2023, except that work in jurisdictional waters and wetlands shall not begin until a meeting between the DOT, Regulatory Agencies, and the Contractor is held as stipulated in the permits contained elsewhere in this proposal. This delay in availability has been considered in determining the contract time for this project.

The completion date for this contract is May 14, 2027.

Except where otherwise provided by the contract, observation periods required by the contract will not be a part of the work to be completed by the completion date and/or intermediate contract times stated in the contract. The acceptable completion of the observation periods that extend beyond the final completion date shall be a part of the work covered by the performance and payment bonds.

The liquidated damages for this contract are **Two Hundred Dollars** (\$ 200.00) per calendar day. These liquidated damages will not be cumulative with any liquidated damages which may become chargeable under Intermediate Contract Time Number 1.

INTERMEDIATE CONTRACT TIME NUMBER 1 AND LIQUIDATED DAMAGES:

(7-1-95) (Rev. 2-21-12) 108 SPI G13 A

Except for that work required under the Project Special Provisions entitled *Planting, Reforestation* and/or *Permanent Vegetation Establishment*, included elsewhere in this proposal, the Contractor will be required to complete all work included in this contract and shall place and maintain traffic on same.

The date of availability for this intermediate contract time is February 1, 2022, except -Y16-, -Y17-, -Y19-, -Y25EXT-, -Y25REV-and -L3- (from Sta. 941+00 +/- to the end of the project) is January 1, 2023.

The completion date for this intermediate contract time is **November 15, 2026**.

The liquidated damages for this intermediate contract time are **Seven Thousand Dollars** (\$ 7,000.00) per calendar day.

Upon apparent completion of all the work required to be completed by this intermediate date, a final inspection will be held in accordance with Article 105-17 and upon acceptance, the Department will assume responsibility for the maintenance of all work except *Planting, Reforestation* and/or *Permanent Vegetation Establishment*. The Contractor will be responsible for and shall make corrections of all damages to the completed roadway caused by his planting operations, whether occurring prior to or after placing traffic through the project.

INTERMEDIATE CONTRACT TIME NUMBER 2 AND LIQUIDATED DAMAGES: (2-20-07) 108 SP

The Contractor shall complete the required work of installing, maintaining, and removing the traffic control devices for lane closures and restoring traffic to the existing traffic pattern. The Contractor shall not close or narrow a lane of traffic on Any Road during the following time restrictions:

DAY AND TIME RESTRICTIONS

Monday thru Friday 6:00 A.M. to 9:00 A.M. & 4:00 P.M. to 6:00 P.M.

In addition, the Contractor shall not close or narrow a lane of traffic on Any Road detain and/or alter the traffic flow on or during holidays, holiday weekends, special events, or any other time when traffic is unusually heavy, including the following schedules:

HOLIDAY AND HOLIDAY WEEKEND LANE CLOSURE RESTRICTIONS

- For unexpected occurrence that creates unusually high traffic volumes, as directed by the 1. Engineer.
- For New Year's Day, between the hours of 6:00 A.M. December 31st and 6:00 P.M. 2. January 2nd. If New Year's Day is on a Friday, Saturday, Sunday or Monday, then until **6:00 P.M.** the following Tuesday.
- 3. For **Easter**, between the hours of **6:00 A.M.** Thursday and **6:00 P.M.** Monday.
- 4. For Memorial Day, between the hours of 6:00 A.M. Friday and 6:00 P.M. Tuesday.
- For Independence Day, between the hours of 6:00 A.M. the day before Independence Day 5. and 6:00 P.M. the day after Independence Day.
 - If **Independence Day** is on a Friday, Saturday, Sunday or Monday, then between the hours of 6:00 A.M. the Thursday before Independence Day and 6:00 P.M. the Tuesday after Independence Day.
- 6. For Labor Day, between the hours of 6:00 A.M. Friday and 6:00 P.M. Tuesday.
- For **Thanksgiving**, between the hours of **6:00 A.M.** Tuesday to **6:00 P.M.** Monday. 7.
- 8. For Christmas, between the hours of 6:00 A.M. the Friday before the week of Christmas Day and **6:00 P.M.** the following Tuesday after the week of Christmas.

Holidays and holiday weekends shall include New Year's, Easter, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas. The Contractor shall schedule his work so that lane closures will not be required during these periods, unless otherwise directed by the Engineer.

The time of availability for this intermediate contract work shall be the time the Contractor begins to install all traffic control devices for lane closures according to the time restrictions listed herein.

The completion time for this intermediate contract work shall be the time the Contractor is required to complete the removal of all traffic control devices for lane closures according to the time restrictions stated above and place traffic in the existing traffic pattern.

The liquidated damages are Five Hundred Dollars (\$ 500.00) per hour.

INTERMEDIATE CONTRACT TIME NUMBER 3 AND LIQUIDATED DAMAGES:

(2-20-07) (Rev. 10-15-13)

108

SP1 G14 F

The Contractor shall complete the required work of installing, maintaining and removing the traffic control devices for road closures and restoring traffic to the existing traffic pattern. The Contractor shall not close **-Y2- (US-221)** during the following time restrictions:

DAY AND TIME RESTRICTIONS

Monday thru Sunday 6:00 A.M. to 1:00 A.M.

The maximum allowable time for **Girder Installation** is **thirty (30)** minutes for **-Y2- (US-221)**. The Contractor shall reopen the travel lanes to traffic until any resulting traffic queue is depleted.

The time of availability for this intermediate contract time will be the time the Contractor begins to install traffic control devices required for road closures according to the time restrictions stated herein.

The completion time for this intermediate contract time will be the time the Contractor is required to complete the removal of traffic control devices required for the road closures according to the time restrictions stated herein and restore traffic to the existing traffic pattern.

The liquidated damages are Two Hundred Fifty Dollars (\$ 250.00) per fifteen (15) minute time period.

INTERMEDIATE CONTRACT TIME NUMBER 4 AND LIQUIDATED DAMAGES:

(2-20-07) (Rev. 6-18-13)

108

SP1 G14 H

The Contractor shall complete the work required of **Phase I**, **Steps #3 and #4** as shown on Sheet **TMP-3** and shall place and maintain traffic on same.

The date of availability for this intermediate contract time is the date the Contractor elects to begin the work.

The completion date for this intermediate contract time is the date which is **three hundred (300)** consecutive calendar days after and including the date the Contractor begins this work.

The liquidated damages are **One Thousand Dollars** (\$ 1,000.00) per calendar day.

INTERMEDIATE CONTRACT TIME NUMBER 5 AND LIQUIDATED DAMAGES:

(2-20-07) (Rev. 6-18-13)

The Contractor shall complete the work required of Phase 1B, Steps #1 and #2 as shown on Sheet TMP-3 and shall place and maintain traffic on same.

The date of availability for this intermediate contract time is the date the Contractor elects to begin the work.

The completion date for this intermediate contract time is the date which is twenty-one (21) consecutive calendar days after and including the date the Contractor begins this work.

The liquidated damages are Five Hundred Dollars (\$ 500.00) per calendar day.

INTERMEDIATE CONTRACT TIME NUMBER 6 AND LIQUIDATED DAMAGES: SPI G14 L

The Contractor shall complete the work required of initial clearing, grubbing and grading operations along -Y2- and along -L3- (from Station 811+00 +/- to 812+00 +/-) to facilitate the installation of Dominion Gas Line.

The date of availability for this intermediate contract time is February 1, 2022.

The completion date for this intermediate contract time is May 1, 2022.

The liquidated damages are **Seven Hundred Dollars** (\$ 700.00) per calendar day.

PERMANENT VEGETATION ESTABLISHMENT:

(2-16-12) (Rev. 10-15-13)

SP1 G16

Establish a permanent stand of the vegetation mixture shown in the contract. During the period between initial vegetation planting and final project acceptance, perform all work necessary to establish permanent vegetation on all erodible areas within the project limits, as well as, in borrow and waste pits. This work shall include erosion control device maintenance and installation, repair seeding and mulching, supplemental seeding and mulching, mowing, and fertilizer topdressing, as directed. All work shall be performed in accordance with the applicable section of the 2018 Standard Specifications. All work required for initial vegetation planting shall be performed as a part of the work necessary for the completion and acceptance of the Intermediate Contract Time (ICT). Between the time of ICT and Final Project acceptance, or otherwise referred to as the vegetation establishment period, the Department will be responsible for preparing the required National Pollutant Discharge Elimination System (NPDES) inspection records.

Once the Engineer has determined that the permanent vegetation establishment requirement has been achieved at an 80% vegetation density (the amount of established vegetation per given area to stabilize the soil) and no erodible areas exist within the project limits, the Contractor will be notified to remove the remaining erosion control devices that are no longer needed. The Contractor will be responsible for, and shall correct any areas disturbed by operations performed in permanent vegetation establishment and the removal of temporary erosion control measures, whether occurring prior to or after placing traffic on the project.

Payment for Response for Erosion Control, Seeding and Mulching, Repair Seeding, Supplemental Seeding, Mowing, Fertilizer Topdressing, Silt Excavation, and Stone for Erosion Control will be made at contract unit prices for the affected items. Work required that is not represented by contract line items will be paid in accordance with Articles 104-7 or 104-3 of the 2018 Standard Specifications. No additional compensation will be made for maintenance and removal of temporary erosion control items.

AWARD OF CONTRACT:

Revise the 2018 Standard Specifications as follows:

Page 1-23, Subarticle 103-4 (A) General, first paragraph, replace the 3rd and 4th sentences with the following:

Where award is to be made, the notice of award will be issued within 60 days after the opening of bids or upon issuance of any necessary debt instrument, whichever is later, but not to exceed 120 days; except with the consent of the lowest responsible bidder the decision to award the contract to such bidder may be delayed for as long a time as may be agreed upon by the Department and such bidder. In the absence of such agreement, the lowest responsible bidder may withdraw his bid at the expiration of 120 days without penalty if no notice of award has been issued.

DELAY IN RIGHT OF ENTRY:

(7-1-95) (Rev. 7-15-14) 108 SPI G22

The Contractor will not be allowed right of entry to the following parcel(s) prior to the listed date(s) unless otherwise permitted by the Engineer.

Parcel No.	Property Owner	<u>Date</u>
5	Dallas Jerry Ownby	02/01/22
42Z	Rutherford Square Partners, LLC	12/22/21
84Z	Second Baptist Church	02/01/22
95	Trellborg Coated Systems	12/22/21
103A	Parton Family LLC	02/01/22
107	Duke Energy Carolinas, LLC	02/01/22
129Z	Kenneth R. Hensley	02/01/22
130Z	Lois Fredericksen	02/01/22
130AZ	Barry K. Jones	02/01/22
131B	Bobby Horton & James Horton	02/01/22
239	Carolina Conference Association 7 th Day Adventist Church	02/01/22
264	C. L. Developers, LLC	07/01/22
268Z	Emery Searcy	02/01/22
269Z	James C. Sanders	02/01/22
270Z	Donna L. Buff	02/01/22

MAJOR CONTRACT ITEMS:

(2-19-02) 104 SPI G28

The following listed items are the major contract items for this contract (see Article 104-5 of the 2018 Standard Specifications):

Line # Description

6 Unclassified Excavation

SPECIALTY ITEMS:

(7-1-95)(Rev. 7-20-21) 108-6 SPI G37

Items listed below will be the specialty items for this contract (see Article 108-6 of the 2018 Standard Specifications).

Line #	Description
131-148	Guardrail
149-153, 401	Fencing
158-180, 226-227, 402-403	Signing
203-205, 208, 219-223	Long-Life Pavement Markings
206-207	Removable Tape
224-225	Permanent Pavement Markers
228-258, 392-397	Utility Construction
259-297	Erosion Control
298-341	Signals/ITS System
365-367	Drilled Piers

FUEL PRICE ADJUSTMENT:

(11-15-05) (Rev. 7-20-21) 109-8 SPI G43

Revise the 2018 Standard Specifications as follows:

Page 1-87, Article 109-8, Fuel Price Adjustments, add the following:

The base index price for DIESEL #2 FUEL is \$ 2.3102 per gallon. Where any of the following are included as pay items in the contract, they will be eligible for fuel price adjustment.

The pay items and the fuel factor used in calculating adjustments to be made will be as follows:

Description	Units	Fuel Usage Factor Diesel
Unclassified Excavation	Gal/CY	0.29
Borrow Excavation	Gal/CY	0.29
Class IV Subgrade Stabilization	Gal/Ton	0.55
Aggregate Base Course	Gal/Ton	0.55
Sub-Ballast	Gal/Ton	0.55
Asphalt Concrete Base Course, Type	Gal/Ton	0.90 or 2.90
Asphalt Concrete Intermediate Course, Type	Gal/Ton	0.90 or 2.90

Asphalt Concrete Surface Course, Type	Gal/Ton	0.90 or 2.90
Open-Graded Asphalt Friction Course	Gal/Ton	0.90 or 2.90
Permeable Asphalt Drainage Course, Type	Gal/Ton	0.90 or 2.90
Sand Asphalt Surface Course, Type	Gal/Ton	0.90 or 2.90
Aggregate for Cement Treated Base Course	Gal/Ton	0.55
Portland Cement for Cement Treated Base Course	Gal/Ton	0.55
" Portland Cement Concrete Pavement	Gal/SY	0.245
Concrete Shoulders Adjacent to" Pavement	Gal/SY	0.245

For the asphalt items noted in the chart as eligible for fuel adjustments, the bidder may include the *Fuel Usage Factor Adjustment Form* with their bid submission if they elect to use the fuel usage factor. The *Fuel Usage Factor Adjustment Form* is found at the following link:

 $\frac{https://connect.ncdot.gov/letting/LetCentral/Fuel\%20Usage\%20Factor\%20Adjustment\%20Form_pdf$

Select either 2.90 Gal/Ton fuel factor or 0.90 Gal/Ton fuel factor for each asphalt line item on the *Fuel Usage Factor Adjustment Form*. The selected fuel factor for each asphalt item will remain in effect for the duration of the contract.

Failure to complete the *Fuel Usage Factor Adjustment Form* will result in using 2.90 gallons per ton as the Fuel Usage Factor for Diesel for the asphalt items noted above. The contractor will not be permitted to change the Fuel Usage Factor after the bids are submitted.

PAYOUT SCHEDULE:

(1-19-10) (Rev. 1-17-12) 108 SPI G57

Submit an Anticipated Monthly Payout Schedule prior to beginning construction. The Anticipated Monthly Payout Schedule will be used by the Department to monitor funding levels for this project. Include a monthly percentage breakdown (in terms of the total contract amount) of the work anticipated to be completed. The schedule should begin with the date the Contractor plans to begin construction and end with the anticipated completion date. Submit updates of the Anticipated Monthly Payout Schedule on March 15, June 15, September 15, and December 15 of each calendar year until project acceptance. Submit the original Anticipated Monthly Payout Schedule and all subsequent updates to the Resident Engineer with a copy to the State Construction Engineer at 1 South Wilmington Street, 1543 Mail Service Center, Raleigh, NC 27699-1543.

SCHEDULE OF ESTIMATED COMPLETION PROGRESS:

Figaal Vaan

(7-15-08) (Rev. 5-13-19) 108-2 SPI G58

The Contractor's attention is directed to the Standard Special Provision entitled *Availability of Funds Termination of Contracts* included elsewhere in this proposal. The Department of Transportation's schedule of estimated completion progress for this project as required by that Standard Special Provision is as follows:

	riscai rear	rrogress (% of Donar value)
2022	(7/01/21 - 6/30/22)	13% of Total Amount Bid
2023	(7/01/22 - 6/30/23)	25% of Total Amount Bid
2024	(7/01/23 - 6/30/24)	23% of Total Amount Bid

Drogress (0/ of Dollar Value)

2025	(7/01/24 - 6/30/25)	21% of Total Amount Bid
2026	(7/01/25 - 6/30/26)	15% of Total Amount Bid
2027	(7/01/26 - 6/30/27)	3 % of Total Amount Bid

The Contractor shall also furnish his own progress schedule in accordance with Article 108-2 of the 2018 Standard Specifications. Any acceleration of the progress as shown by the Contractor's progress schedule over the progress as shown above shall be subject to the approval of the Engineer.

MINORITY BUSINESS ENTERPRISE AND WOMEN BUSINESS ENTERPRISE:

(10-16-07)(Rev. 8-17-21)

102-15(J)

SP1 G66

Description

The purpose of this Special Provision is to carry out the North Carolina Department of Transportation's policy of ensuring nondiscrimination in the award and administration of contracts financed in whole or in part with State funds.

Definitions

Additional MBE/WBE Subcontractors - Any MBE/WBE submitted at the time of bid that will not be used to meet the Combined MBE /WBE Goal. No submittal of a Letter of Intent is required.

Combined MBE/WBE Goal: A portion of the total contract, expressed as a percentage that is to be performed by committed MBE/WBE subcontractors.

Committed MBE/WBE Subcontractor - Any MBE/WBE submitted at the time of bid that is being used to meet the Combined MBE /WBE goal by submission of a Letter of Intent. Or any MBE or WBE used as a replacement for a previously committed MBE or WBE firm.

Contract Goal Requirement - The approved participation at time of award, but not greater than the advertised Combined MBE/WBE contract goal.

Goal Confirmation Letter - Written documentation from the Department to the bidder confirming the Contractor's approved, committed participation along with a listing of the committed MBE and WBE firms.

Manufacturer - A firm that operates or maintains a factory or establishment that produces on the premises, the materials or supplies obtained by the Contractor.

MBE Participation (Anticipated) - A portion of the total contract, expressed as a percentage that is anticipated to be performed by committed MBE subcontractor(s).

Minority Business Enterprise (MBE) - A firm certified as a Disadvantaged Minority-Owned Business Enterprise through the North Carolina Unified Certification Program.

Regular Dealer - A firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials or supplies required for the performance of the contract are bought, kept in stock, and regularly sold to the public in the usual course of business. A regular

dealer engages in, as its principal business and in its own name, the purchase and sale or lease of the products in question. A regular dealer in such bulk items as steel, cement, gravel, stone, and petroleum products need not keep such products in stock, if it owns and operates distribution equipment for the products. Brokers and packagers are not regarded as manufacturers or regular dealers within the meaning of this section.

Replacement / Substitution – A full or partial reduction in the amount of work subcontracted to a committed (or an approved substitute) MBE/WBE firm.

North Carolina Unified Certification Program (NCUCP) - A program that provides comprehensive services and information to applicants for MBE/WBE certification. The MBE/WBE program follows the same regulations as the federal Disadvantaged Business Enterprise (DBE) program in accordance with 49 CFR Part 26.

United States Department of Transportation (USDOT) - Federal agency responsible for issuing regulations (49 CFR Part 26) and official guidance for the DBE program.

WBE Participation (Anticipated) - A portion of the total contract, expressed as a percentage, that is anticipated to be performed by committed WBE subcontractor(s).

Women Business Enterprise (WBE) - A firm certified as a Disadvantaged Women-Owned Business Enterprise through the North Carolina Unified Certification Program.

Forms and Websites Referenced in this Provision

Payment Tracking System - On-line system in which the Contractor enters the payments made to MBE and WBE subcontractors who have performed work on the project. https://apps.dot.state.nc.us/Vendor/PaymentTracking/

DBE-IS *Subcontractor Payment Information* - Form for reporting the payments made to all MBE/WBE firms working on the project. This form is for paper bid projects only. https://connect.ncdot.gov/business/Turnpike/Documents/Form%20DBE-IS%20Subcontractor%20Payment%20Information.pdf

RF-1 *MBE/WBE Replacement Request Form* - Form for replacing a committed MBE or WBE. http://connect.ncdot.gov/projects/construction/Construction%20Forms/DBE%20MBE%20WBE%20Replacement%20Request%20Form.pdf

SAF *Subcontract Approval Form* - Form required for approval to sublet the contract. http://connect.ncdot.gov/projects/construction/Construction%20Forms/Subcontract%20Approval%20Form%20Rev.%202012.zip

JC-1 *Joint Check Notification Form* - Form and procedures for joint check notification. The form acts as a written joint check agreement among the parties providing full and prompt disclosure of the expected use of joint checks.

http://connect.ncdot.gov/projects/construction/Construction%20 Forms/Joint%20 Check%20 Notification%20 Form.pdf

Letter of Intent - Form signed by the Contractor and the MBE/WBE subcontractor, manufacturer or regular dealer that affirms that a portion of said contract is going to be performed by the signed MBE/WBE for the estimated amount (based on quantities and unit prices) listed at the time of bid. http://connect.ncdot.gov/letting/LetCentral/Letter%20of%20Intent%20to%20Perform%20as%20 a%20Subcontractor.pdf

Listing of MBE and WBE Subcontractors Form - Form for entering MBE/WBE subcontractors on a project that will meet the Combined MBE/WBE goal. This form is for paper bids only. http://connect.ncdot.gov/municipalities/Bid%20Proposals%20for%20LGA%20Content/09%20MBE-WBE%20Subcontractors%20(State).docx

Subcontractor Quote Comparison Sheet - Spreadsheet for showing all subcontractor quotes in the work areas where MBEs and WBEs quoted on the project. This sheet is submitted with good faith effort packages.

http://connect.ncdot.gov/business/SmallBusiness/Documents/DBE%20Subcontractor%20Quote%20Comparison%20Example.xls

Combined MBE/WBE Goal

The Combined MBE/WBE Goal for this project is 9.0 %

The Combined Goal was established utilizing the following anticipated participation for Minority Business Enterprises and Women Business Enterprises:

- (A) Minority Business Enterprises 4.0 %
 - (1) If the anticipated MBE participation is more than zero, the Contractor shall exercise all necessary and reasonable steps to ensure that MBEs participate in at least the percent of the contract as set forth above.
 - (2) If the anticipated MBE participation is zero, the Contractor shall make an effort to recruit and use MBEs during the performance of the contract. Any MBE participation obtained shall be reported to the Department.
- (B) Women Business Enterprises 5.0 %
 - (1) If the anticipated WBE participation is more than zero, the Contractor shall exercise all necessary and reasonable steps to ensure that WBEs participate in at least the percent of the contract as set forth above.
 - (2) If the anticipated WBE participation is zero, the Contractor shall make an effort to recruit and use WBEs during the performance of the contract. Any WBE participation obtained shall be reported to the Department.

The Bidder is required to submit only participation to meet the Combined MBE/WBE Goal. The Combined Goal may be met by submitting all MBE participation, all WBE participation, or a combination of MBE and WBE participation.

Directory of Transportation Firms (Directory)

Real-time information is available about firms doing business with the Department and firms that are certified through NCUCP in the Directory of Transportation Firms. Only firms identified in the Directory as MBE and WBE certified shall be used to meet the Combined MBE/WBE Goal. The Directory can be found at the following link.

https://www.ebs.nc.gov/VendorDirectory/default.html

The listing of an individual firm in the directory shall not be construed as an endorsement of the firm's capability to perform certain work.

Listing of MBE/WBE Subcontractors

At the time of bid, bidders shall submit <u>all</u> MBE and WBE participation that they anticipate to use during the life of the contract. Only those identified to meet the Combined MBE/WBE Goal will be considered committed, even though the listing shall include both committed MBE/WBE subcontractors and additional MBE/WBE subcontractors. Any additional MBE/WBE subcontractor participation above the goal will follow the banking guidelines found elsewhere in this provision. All other additional MBE/WBE subcontractor participation submitted at the time of bid will be used toward the Department's overall race-neutral goals. Only those firms with current MBE and WBE certification at the time of bid opening will be acceptable for listing in the bidder's submittal of MBE and WBE participation. The Contractor shall indicate the following required information:

(A) Electronic Bids

Bidders shall submit a listing of MBE and WBE participation in the appropriate section of the electronic submittal file.

- (1) Submit the names and addresses of MBE and WBE firms identified to participate in the contract. If the bidder uses the updated listing of MBE and WBE firms shown in the electronic submittal file, the bidder may use the dropdown menu to access the name and address of the firms.
- (2) Submit the contract line numbers of work to be performed by each MBE and WBE firm. When no figures or firms are entered, the bidder will be considered to have no MBE or WBE participation.
- (3) The bidder shall be responsible for ensuring that the MBE and WBE are certified at the time of bid by checking the Directory of Transportation Firms. If the firm is not certified at the time of the bid-letting, that MBE's or WBE's participation will not count towards achieving the Combined MBE/WBE goal.

- (B) Paper Bids
 - (1) If the Combined MBE/WBE Goal is more than zero,
 - (a) Bidders, at the time the bid proposal is submitted, shall submit a listing of MBE/WBE participation, including the names and addresses on *Listing of MBE and WBE Subcontractors* contained elsewhere in the contract documents in order for the bid to be considered responsive. Bidders shall indicate the total dollar value of the MBE and WBE participation for the contract.
 - (b) If bidders have no MBE or WBE participation, they shall indicate this on the *Listing of MBE and WBE Subcontractors* by entering the word "None" or the number "0." This form shall be completed in its entirety. **Blank forms will not be deemed to represent zero participation.** Bids submitted that do not have MBE and WBE participation indicated on the appropriate form will not be read publicly during the opening of bids. The Department will not consider these bids for award and the proposal will be rejected.
 - (c) The bidder shall be responsible for ensuring that the MBE/WBE is certified at the time of bid by checking the Directory of Transportation Firms. If the firm is not certified at the time of the bid-letting, that MBE's or WBE's participation will not count towards achieving the Combined MBE/WBE Goal.
 - (2) If the Combined MBE/WBE Goal is zero, entries on the Listing of MBE and WBE Subcontractors are not required for the zero goal, however any MBE or WBE participation that is achieved during the project shall be reported in accordance with requirements contained elsewhere in the special provision.

MBE or WBE Prime Contractor

When a certified MBE or WBE firm bids on a contract that contains a Combined MBE/WBE goal, the firm is responsible for meeting the goal or making good faith efforts to meet the goal, just like any other bidder. In most cases, a MBE or WBE bidder on a contract will meet the Combined MBE/WBE Goal by virtue of the work it performs on the contract with its own forces. However, all the work that is performed by the MBE or WBE bidder and any other similarly certified subcontractors will count toward the goal. The MBE or WBE bidder shall list itself along with any MBE or WBE subcontractors, if any, in order to receive credit toward the goal.

MBE/WBE prime contractors shall also follow Sections A and B listed under *Listing of MBE/WBE Subcontractor* just as a non-MBE/WBE bidder would.

Written Documentation - Letter of Intent

The bidder shall submit written documentation for each MBE/WBE that will be used to meet the Combined MBE/WBE Goal of the contract, indicating the bidder's commitment to use the

MBE/WBE in the contract. This documentation shall be submitted on the Department's form titled *Letter of Intent*.

The documentation shall be received in the office of the State Contractor Utilization Engineer or at DBE@ncdot.gov no later than 10:00 a.m. of the sixth calendar day following opening of bids, unless the sixth day falls on an official state holiday. In that situation, it is due in the office of the State Contractor Utilization Engineer no later than 10:00 a.m. on the next official state business day.

If the bidder fails to submit the Letter of Intent from each committed MBE and WBE to be used toward the Combined MBE/WBE Goal, or if the form is incomplete (i.e. both signatures are not present), the MBE/WBE participation will not count toward meeting the Combined MBE/WBE Goal. If the lack of this participation drops the commitment below the Combined MBE/WBE Goal, the Contractor shall submit evidence of good faith efforts for the goal, completed in its entirety, to the State Contractor Utilization Engineer or DBE@ncdot.gov no later than 10:00 a.m. on the eighth calendar day following opening of bids, unless the eighth day falls on an official state holiday. In that situation, it is due in the office of the State Contractor Utilization Engineer no later than 10:00 a.m. on the next official state business day.

Banking MBE/WBE Credit

If the bid of the lowest responsive bidder exceeds \$500,000 and if the committed MBE/WBE participation submitted exceeds the algebraic sum of the Combined MBE /WBE Goal by \$1,000 or more, the excess will be placed on deposit by the Department for future use by the bidder. Separate accounts will be maintained for MBE and WBE participation and these may accumulate for a period not to exceed 24 months.

When the apparent lowest responsive bidder fails to submit sufficient participation by MBE and WBE firms to meet the advertised goal, as part of the good faith effort, the Department will consider allowing the bidder to withdraw funds to meet the Combined MBE/WBE Goal as long as there are adequate funds available from the bidder's MBE and WBE bank accounts.

Submission of Good Faith Effort

If the bidder fails to meet or exceed the Combined MBE/WBE Goal, the apparent lowest responsive bidder shall submit to the Department documentation of adequate good faith efforts made to reach that specific goal.

A hard copy and an electronic copy of this information shall be received in the office of the State Contractor Utilization Engineer or at DBE@ncdot.gov no later than 10:00 a.m. on the sixth calendar day following opening of bids unless the sixth day falls on an official state holiday. In that situation, it would be due in the office of the State Contractor Utilization Engineer no later than 10:00 a.m. on the next official state business day. If the contractor cannot send the information electronically, then one complete set and 5 copies of this information shall be received under the same time constraints above.

Note: Where the information submitted includes repetitious solicitation letters, it will be acceptable to submit a representative letter along with a distribution list of the firms that were

solicited. Documentation of MBE/WBE quotations shall be a part of the good faith effort submittal. This documentation may include written subcontractor quotations, telephone log notations of verbal quotations, or other types of quotation documentation.

Consideration of Good Faith Effort for Projects with a Combined MBE/WBE Goal More Than Zero

Adequate good faith efforts mean that the bidder took all necessary and reasonable steps to achieve the goal which, by their scope, intensity, and appropriateness, could reasonably be expected to obtain sufficient MBE/WBE participation. Adequate good faith efforts also mean that the bidder actively and aggressively sought MBE/WBE participation. Mere *pro forma* efforts are not considered good faith efforts.

The Department will consider the quality, quantity, and intensity of the different kinds of efforts a bidder has made. Listed below are examples of the types of actions a bidder will take in making a good faith effort to meet the goals and are not intended to be exclusive or exhaustive, nor is it intended to be a mandatory checklist.

- (A) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising, written notices, use of verifiable electronic means through the use of the NCDOT Directory of Transportation Firms) the interest of all certified MBEs/WBEs that are also prequalified subcontractors. The bidder must solicit this interest within at least 10 days prior to bid opening to allow the MBEs/WBEs to respond to the solicitation. Solicitation shall provide the opportunity to MBEs/WBEs within the Division and surrounding Divisions where the project is located. The bidder must determine with certainty if the MBEs/WBEs are interested by taking appropriate steps to follow up initial solicitations.
- (B) Selecting portions of the work to be performed by MBEs/WBEs in order to increase the likelihood that the Combined MBE/WBE Goal will be achieved.
 - (1) Where appropriate, break out contract work items into economically feasible units to facilitate MBE/WBE participation, even when the prime contractor might otherwise prefer to perform these work items with its own forces.
 - (2) Negotiate with subcontractors to assume part of the responsibility to meet the advertised goal when the work to be sublet includes potential for MBE/WBE participation (2nd and 3rd tier subcontractors).
- (C) Providing interested certified MBEs/WBEs that are also prequalified subcontractors with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.
- (D) (1) Negotiating in good faith with interested MBEs/WBEs. It is the bidder's responsibility to make a portion of the work available to MBE/WBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available MBE/WBE subcontractors and suppliers, so as to facilitate MBE/WBE participation. Evidence of such negotiation includes the names,

addresses, and telephone numbers of MBEs/WBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for MBEs/WBEs to perform the work.

- (2) A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including MBE/WBE subcontractors, and would take a firm's price and capabilities as well as the advertised goal into consideration. However, the fact that there may be some additional costs involved in finding and using MBEs/WBEs is not in itself sufficient reason for a bidder's failure to meet the contract goal, as long as such costs are reasonable. Also, the ability or desire of a prime contractor to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidding contractors are not, however, required to accept higher quotes from MBEs/WBEs if the price difference is excessive or unreasonable.
- (E) Not rejecting MBEs/WBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associates and political or social affiliations (for example, union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.
- (F) Making efforts to assist interested MBEs/WBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or bidder.
- (G) Making efforts to assist interested MBEs/WBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.
- (H) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; Federal, State, and local minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of MBEs/WBEs. Contact within 7 days from the bid opening the Business Opportunity and Work Force Development Unit at BOWD@ncdot.gov to give notification of the bidder's inability to get MBE or WBE quotes.
- (I) Any other evidence that the bidder submits which shows that the bidder has made reasonable good faith efforts to meet the advertised goal.

In addition, the Department may take into account the following:

- (1) Whether the bidder's documentation reflects a clear and realistic plan for achieving the Combined MBE/WBE Goal.
- (2) The bidders' past performance in meeting the contract goal.
- (3) The performance of other bidders in meeting the advertised goal. For example, when the apparent successful bidder fails to meet the goal, but others meet it, you

may reasonably raise the question of whether, with additional reasonable efforts the apparent successful bidder could have met the goal. If the apparent successful bidder fails to meet the advertised goal, but meets or exceeds the average MBE and WBE participation obtained by other bidders, the Department may view this, in conjunction with other factors, as evidence of the apparent successful bidder having made a good faith effort.

If the Department does not award the contract to the apparent lowest responsive bidder, the Department reserves the right to award the contract to the next lowest responsive bidder that can satisfy to the Department that the Combined MBE/WBE Goal can be met or that an adequate good faith effort has been made to meet the advertised goal.

Non-Good Faith Appeal

The State Prequalification Engineer will notify the contractor verbally and in writing of non-good faith. A contractor may appeal a determination of non-good faith made by the Goal Compliance Committee. If a contractor wishes to appeal the determination made by the Committee, they shall provide written notification to the State Prequalification Engineer or at DBE@ncdot.gov. The appeal shall be made within 2 business days of notification of the determination of non-good faith.

Counting MBE/WBE Participation Toward Meeting the Combined MBE/WBE Goal

(A) Participation

The total dollar value of the participation by a committed MBE/WBE will be counted toward the contract goal requirements. The total dollar value of participation by a committed MBE/WBE will be based upon the value of work actually performed by the MBE/WBE and the actual payments to MBE/WBE firms by the Contractor.

(B) Joint Checks

Prior notification of joint check use shall be required when counting MBE/WBE participation for services or purchases that involves the use of a joint check. Notification shall be through submission of Form JC-1 (*Joint Check Notification Form*) and the use of joint checks shall be in accordance with the Department's Joint Check Procedures.

(C) Subcontracts (Non-Trucking)

A MBE/WBE may enter into subcontracts. Work that a MBE subcontracts to another MBE firm may be counted toward the anticipated MBE participation. The same holds true for work that a WBE subcontracts to another WBE firm. Work that a MBE/WBE subcontracts to a non-MBE/WBE firm does <u>not</u> count toward the contract goal requirement. It should be noted that every effort shall be made by MBE and WBE contractors to subcontract to the same certification (i.e., MBEs to MBEs and WBEs to WBEs), in order to fulfill the MBE or WBE participation breakdown. This, however, may not always be possible due to the limitation of firms in the area. If the MBE or WBE firm shows a good faith effort has been made to reach out to similarly certified firms and there is no interest or availability,

and they can get assistance from other certified firms, the Engineer will not hold the prime responsible for meeting the individual MBE or WBE breakdown. If a MBE or WBE contractor or subcontractor subcontracts a significantly greater portion of the work of the contract than would be expected on the basis of standard industry practices, it shall be presumed that the MBE or WBE is not performing a commercially useful function.

(D) Joint Venture

When a MBE or WBE performs as a participant in a joint venture, the Contractor may count toward its contract goal requirement a portion of the total value of participation with the MBE or WBE in the joint venture, that portion of the total dollar value being a distinct clearly defined portion of work that the MBE or WBE performs with its forces.

(E) Suppliers

A contractor may count toward its MBE/WBE requirement 60 percent of its expenditures for materials and supplies required to complete the contract and obtained from a MBE or WBE regular dealer and 100 percent of such expenditures from a MBE or WBE manufacturer.

(F) Manufacturers and Regular Dealers

A contractor may count toward its MBE/WBE requirement the following expenditures to MBE/WBE firms that are not manufacturers or regular dealers:

- (1) The fees or commissions charged by a MBE/WBE firm for providing a *bona fide* service, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a DOT-assisted contract, provided the fees or commissions are determined to be reasonable and not excessive as compared with fees and commissions customarily allowed for similar services.
- (2) With respect to materials or supplies purchased from a MBE/WBE, which is neither a manufacturer nor a regular dealer, count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site (but not the cost of the materials and supplies themselves), provided the fees are determined to be reasonable and not excessive as compared with fees customarily allowed for similar services.

Commercially Useful Function

(A) MBE/WBE Utilization

The Contractor may count toward its contract goal requirement only expenditures to MBEs and WBEs that perform a commercially useful function in the work of a contract. A MBE/WBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually

performing, managing, and supervising the work involved. To perform a commercially useful function, the MBE/WBE shall also be responsible with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material and installing (where applicable) and paying for the material itself. To determine whether a MBE/WBE is performing a commercially useful function, the Department will evaluate the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the contract is commensurate with the work it is actually performing and the MBE/WBE credit claimed for its performance of the work, and any other relevant factors. If it is determined that a MBE or WBE is not performing a Commercially Useful Function, the contractor may present evidence to rebut this presumption to the Department.

(B) MBE/WBE Utilization in Trucking

The following factors will be used to determine if a MBE or WBE trucking firm is performing a commercially useful function:

- (1) The MBE/WBE shall be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there shall not be a contrived arrangement for the purpose of meeting the Combined MBE/WBE Goal.
- (2) The MBE/WBE shall itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
- (3) The MBE/WBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.
- (4) The MBE may subcontract the work to another MBE firm, including an owner-operator who is certified as a MBE. The same holds true that a WBE may subcontract the work to another WBE firm, including an owner-operator who is certified as a WBE. When this occurs, the MBE or WBE who subcontracts work receives credit for the total value of the transportation services the subcontracted MBE or WBE provides on the contract. It should be noted that every effort shall be made by MBE and WBE contractors to subcontract to the same certification (i.e., MBEs to MBEs and WBEs to WBEs), in order to fulfill the participation breakdown. This, however, may not always be possible due to the limitation of firms in the area. If the MBE or WBE firm shows a good faith effort has been made to reach out to similarly certified transportation service providers and there is no interest or availability, and they can get assistance from other certified providers, the Engineer will not hold the prime responsible for meeting the individual MBE or WBE participation breakdown.
- (5) The MBE/WBE may also subcontract the work to a non-MBE/WBE firm, including from an owner-operator. The MBE/WBE who subcontracts the work to a non-MBE/WBE is entitled to credit for the total value of transportation services

provided by the non-MBE/WBE subcontractor not to exceed the value of transportation services provided by MBE/WBE-owned trucks on the contract. Additional participation by non-MBE/WBE subcontractors receives credit only for the fee or commission it receives as a result of the subcontract arrangement. The value of services performed under subcontract agreements between the MBE/WBE and the Contractor will not count towards the MBE/WBE contract requirement.

- (6) A MBE/WBE may lease truck(s) from an established equipment leasing business open to the general public. The lease must indicate that the MBE/WBE has exclusive use of and control over the truck. This requirement does not preclude the leased truck from working for others during the term of the lease with the consent of the MBE/WBE, so long as the lease gives the MBE/WBE absolute priority for use of the leased truck. This type of lease may count toward the MBE/WBE's credit as long as the driver is under the MBE/WBE's payroll.
- (7) Subcontracted/leased trucks shall display clearly on the dashboard the name of the MBE/WBE that they are subcontracted/leased to and their own company name if it is not identified on the truck itself. Magnetic door signs are not permitted.

MBE/WBE Replacement

When a Contractor has relied on a commitment to a MBE or WBE subcontractor (or an approved substitute MBE or WBE subcontractor) to meet all or part of a contract goal requirement, the contractor shall not terminate the MBE/WBE subcontractor for convenience. This includes, but is not limited to, instances in which the Contractor seeks to perform the work of the terminated subcontractor with another MBE/WBE subcontractor, a non-MBE/WBE subcontractor, or with the Contractor's own forces or those of an affiliate.

The Contractor must give notice in writing both by certified mail and email to the MBE/WBE subcontractor, with a copy to the Engineer of its intent to request to terminate and/or substitute, and the reason for the request. The Contractor must give the MBE/WBE subcontractor five (5) business days to respond to the Contractor's Notice of Intent to Request Termination and/or Substitution. If the MBE/WBE subcontractor objects to the intended termination/substitution, the MBE/WBE, within five (5) business days must advise the Contractor and the Department of the reasons why the action should not be approved. The five-day notice period shall begin on the next business day after written notice is provided to the MBE/WBE subcontractor.

A committed MBE/WBE subcontractor may only be terminated after receiving the Department's written approval based upon a finding of good cause for the proposed termination and/or substitution. For purposes of this section, good cause shall include the following circumstances:

- (a) The listed MBE/WBE subcontractor fails or refuses to execute a written contract;
- (b) The listed MBE/WBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the MBE/WBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the prime contractor;

- (c) The listed MBE/WBE subcontractor fails or refuses to meet the prime contractor's reasonable, nondiscriminatory bond requirements;
- (d) The listed MBE/WBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;
- (e) The listed MBE/WBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant to 2 CFR Parts 180, 215 and 1,200 or applicable state law;
- (f) The listed MBE/WBE subcontractor is not a responsible contractor;
- (g) The listed MBE/WBE voluntarily withdraws from the project and provides written notice of withdrawal;
- (h) The listed MBE/WBE is ineligible to receive MBE/WBE credit for the type of work required;
- (i) A MBE/WBE owner dies or becomes disabled with the result that the listed MBE/WBE contractor is unable to complete its work on the contract;
- (j) Other documented good cause that compels the termination of the MBE/WBE subcontractor. Provided, that good cause does not exist if the prime contractor seeks to terminate a MBE/WBE it relied upon to obtain the contract so that the prime contractor can self-perform the work for which the MBE/WBE contractor was engaged or so that the prime contractor can substitute another MBE/WBE or non-MBE/WBE contractor after contract award.

The Contractor shall comply with the following for replacement of a committed MBE/WBE:

(A) Performance Related Replacement

When a committed MBE/WBE is terminated for good cause as stated above, an additional MBE/WBE that was submitted at the time of bid may be used to fulfill the MBE/WBE commitment to meet the Combined MBE/WBE Goal. A good faith effort will only be required for removing a committed MBE/WBE if there were no additional MBE/WBE submitted at the time of bid to cover the same amount of work as the MBE/WBE that was terminated.

If a replacement MBE/WBE is not found that can perform at least the same amount of work as the terminated MBE/WBE, the Contractor shall submit a good faith effort documenting the steps taken. Such documentation shall include, but not be limited to, the following:

- (1) Copies of written notification to MBE/WBEs that their interest is solicited in contracting the work defaulted by the previous MBE/WBE or in subcontracting other items of work in the contract.
- (2) Efforts to negotiate with MBE/WBEs for specific subbids including, at a minimum:
 - (a) The names, addresses, and telephone numbers of MBE/WBEs who were contacted
 - (b) A description of the information provided to MBE/WBEs regarding the plans and specifications for portions of the work to be performed.
- (3) A list of reasons why MBE/WBE quotes were not accepted.

(4) Efforts made to assist the MBE/WBEs contacted, if needed, in obtaining bonding or insurance required by the Contractor.

(B) Decertification Replacement

- (1) When a committed MBE/WBE is decertified by the Department after the SAF (Subcontract Approval Form) has been received by the Department, the Department will not require the Contractor to solicit replacement MBE/WBE participation equal to the remaining work to be performed by the decertified firm. The participation equal to the remaining work performed by the decertified firm will count toward the contract goal requirement.
- When a committed MBE/WBE is decertified prior to the Department receiving the SAF (*Subcontract Approval Form*) for the named MBE/WBE firm, the Contractor shall take all necessary and reasonable steps to replace the MBE/WBE subcontractor with another MBE/WBE subcontractor to perform at least the same amount of work to meet the Combined MBE/WBE goal requirement. If a MBE/WBE firm is not found to do the same amount of work, a good faith effort must be submitted to NCDOT (see A herein for required documentation).
- (3) Exception: If the MBE/WBE's ineligibility is caused solely by its having exceeded the size standard during the performance of the contract, the Department will not require the Contractor to solicit replacement MBE/WBE participation equal to the remaining work to be performed by the decertified firm. The participation equal to the remaining work performed by the decertified firm will count toward the contract goal requirement and overall goal.

All requests for replacement of a committed MBE/WBE firm shall be submitted to the Engineer for approval on Form RF-1 (DBE Replacement Request). If the Contractor fails to follow this procedure, the Contractor may be disqualified from further bidding for a period of up to 6 months.

Changes in the Work

When the Engineer makes changes that result in the reduction or elimination of work to be performed by a committed MBE/WBE, the Contractor will not be required to seek additional participation. When the Engineer makes changes that result in additional work to be performed by a MBE/WBE based upon the Contractor's commitment, the MBE/WBE shall participate in additional work to the same extent as the MBE/WBE participated in the original contract work.

When the Engineer makes changes that result in extra work, which has more than a minimal impact on the contract amount, the Contractor shall seek additional participation by MBEs/WBEs unless otherwise approved by the Engineer.

When the Engineer makes changes that result in an alteration of plans or details of construction, and a portion or all of the work had been expected to be performed by a committed MBE/WBE, the Contractor shall seek participation by MBEs/WBEs unless otherwise approved by the Engineer.

When the Contractor requests changes in the work that result in the reduction or elimination of work that the Contractor committed to be performed by a MBE/WBE, the Contractor shall seek additional participation by MBEs/WBEs equal to the reduced MBE/WBE participation caused by the changes.

Reports and Documentation

A SAF (*Subcontract Approval Form*) shall be submitted for all work which is to be performed by a MBE/WBE subcontractor. The Department reserves the right to require copies of actual subcontract agreements involving MBE/WBE subcontractors.

When using transportation services to meet the contract commitment, the Contractor shall submit a proposed trucking plan in addition to the SAF. The plan shall be submitted prior to beginning construction on the project. The plan shall include the names of all trucking firms proposed for use, their certification type(s), the number of trucks owned by the firm, as well as the individual truck identification numbers, and the line item(s) being performed.

Within 30 calendar days of entering into an agreement with a MBE/WBE for materials, supplies or services, not otherwise documented by the SAF as specified above, the Contractor shall furnish the Engineer a copy of the agreement. The documentation shall also indicate the percentage (60% or 100%) of expenditures claimed for MBE/WBE credit.

Reporting Minority and Women Business Enterprise Participation

The Contractor shall provide the Engineer with an accounting of payments made to all MBE/WBE firms, including material suppliers and contractors at all levels (prime, subcontractor, or second tier subcontractor). This accounting shall be furnished to the Engineer for any given month by the end of the following month. Failure to submit this information accordingly may result in the following action:

- (A) Withholding of money due in the next partial pay estimate; or
- (B) Removal of an approved contractor from the prequalified bidders' list or the removal of other entities from the approved subcontractors list.

While each contractor (prime, subcontractor, 2nd tier subcontractor) is responsible for accurate accounting of payments to MBEs/WBEs, it shall be the prime contractor's responsibility to report all monthly and final payment information in the correct reporting manner.

Failure on the part of the Contractor to submit the required information in the time frame specified may result in the disqualification of that contractor and any affiliate companies from further bidding until the required information is submitted.

Failure on the part of any subcontractor to submit the required information in the time frame specified may result in the disqualification of that contractor and any affiliate companies from being approved for work on future DOT projects until the required information is submitted.

Contractors reporting transportation services provided by non-MBE/WBE lessees shall evaluate the value of services provided during the month of the reporting period only.

At any time, the Engineer can request written verification of subcontractor payments.

The Contractor shall report the accounting of payments through the Department's Payment Tracking System.

Failure to Meet Contract Requirements

Failure to meet contract requirements in accordance with Subarticle 102-15(J) of the 2018 Standard Specifications may be cause to disqualify the Contractor.

CONTRACTOR'S LICENSE REQUIREMENTS:

(7-1-95) 102-14

SP1 G88

If the successful bidder does not hold the proper license to perform any plumbing, heating, air conditioning, or electrical work in this contract, he will be required to sublet such work to a contractor properly licensed in accordance with *Article 2 of Chapter 87 of the General Statutes* (licensing of heating, plumbing, and air conditioning contractors) and *Article 4 of Chapter 87* of the *General Statutes* (licensing of electrical contractors).

RESTRICTIONS ON ITS EQUIPMENT AND SERVICES:

(11-17-20)

SP01 G090

All telecommunications, video or other ITS equipment or services installed or utilized on this project must be in conformance with UNIFORM ADMINISTRATIVE REQUIREMENTS, COST PRINCIPLES, AND AUDIT REQUIREMENTS FOR FEDERAL AWARDS 2 CFR, § 200.216 Prohibition on certain telecommunications and video surveillance services or equipment.

USE OF UNMANNED AIRCRAFT SYSTEM (UAS):

(8-20-19)

SP1 G092

The Contractor shall adhere to all Federal, State and Local regulations and guidelines for the use of Unmanned Aircraft Systems (UAS). This includes but is not limited to US 14 CFR Part 107 Small UAS Rule, NC GS 15A-300.2 Regulation of launch and recovery sites, NC GS 63-95 Training required for the operation of unmanned aircraft systems, NC GS 63-96 Permit required for commercial operation of unmanned aircraft system, and NCDOT UAS Policy. The required operator certifications include possessing a current Federal Aviation Administration (FAA) Remote Pilot Certificate, a NC UAS Operator Permit as well as operating a UAS registered with the FAA.

Prior to beginning operations, the Contractor shall complete the NCDOT UAS – Flight Operation Approval Form and submit it to the Engineer for approval. All UAS operations shall be approved by the Engineer prior to beginning the operations.

All contractors or subcontractors operating UAS shall have UAS specific general liability insurance to cover all operations under this contract.

The use of UAS is at the Contractor's discretion. No measurement or payment will be made for the use of UAS. In the event that the Department directs the Contractor to utilize UAS, payment will be in accordance with Article 104-7 Extra Work.

EQUIPMENT IDLING GUIDELINES:

(1-19-21) 107

SP1 G096

SP1 G121

Exercise reduced fuel consumption and reduced equipment emissions during the construction of all work associated with this contract. Employees engaged in the construction of this project should turn off vehicles when stopped for more than thirty (30) minutes and off-highway equipment should idle no longer than fifteen (15) consecutive minutes.

These guidelines for turning off vehicles and equipment when idling do not apply to:

- 1. Idling when queuing.
- 2. Idling to verify the vehicle is in safe operating condition.
- 3. Idling for testing, servicing, repairing or diagnostic purposes.
- 4. Idling necessary to accomplish work for which the vehicle was designed (such as operating a crane, mixing concrete, etc.).
- 5. Idling required to bring the machine system to operating temperature.
- 6. Emergency vehicles, utility company, construction, and maintenance vehicles where the engines must run to perform needed work.
- 7. Idling to ensure safe operation of the vehicle.
- 8. Idling when the propulsion engine is providing auxiliary power for other than heating or air conditioning. (such as hydraulic systems for pavers)
- 9. When specific traffic, safety, or emergency situations arise.
- 10. If the ambient temperature is less than 32 degrees Fahrenheit. Limited idling to provide for the safety of vehicle occupants (e.g. to run the heater).
- 11. If the ambient temperature is greater than 90 degrees Fahrenheit. Limited idling to provide for the safety of vehicle occupants of off-highway equipment (e.g. to run the air conditioning) no more than 30 minutes.
- 12. Diesel powered vehicles may idle for up to 30 minutes to minimize restart problems. Any vehicle, truck, or equipment in which the primary source of fuel is natural gas or electricity is exempt from the idling limitations set forth in this special provision.

SUBSURFACE INFORMATION:

(7-1-95) 450 SPI GI12 C

Subsurface information is available on the roadway and structure portions of this project.

PORTABLE CONCRETE BARRIER - (Partial Payments for Materials):

(7-1-95) (Rev. 8-16-11) 1170-4

When so authorized by the Engineer, partial materials payments will be made up to 95 percent of the delivered cost of portable concrete barrier, provided that these materials have been delivered on the project and stored in an acceptable manner, and further provided the documents listed in Subarticle 109-5(C) of the 2018 Standard Specifications have been furnished to the Engineer.

The provisions of Subarticle 109-5(B) of the 2018 Standard Specifications will apply to the portable concrete barrier.

REMOVABLE PAVEMENT MARKINGS - (Partial Payments for Materials):

(7-1-95) (Rev. 8-16-11)

SP1 G124

When so authorized by the Engineer, partial materials payments will be made up to 95 percent of the delivered cost of pavement marking tape, provided that these materials have been delivered on or in the vicinity of the project, stored in an acceptable manner, not to exceed the shelf life recommended by the manufacturer, and further provided the documents listed in Subarticle 109-5(C) of the 2018 Standard Specifications have been furnished to the Engineer.

The Contractor shall be responsible for the material and the satisfactory performance of the material when used in the work.

The provisions of Article 109-6 of the 2018 Standard Specifications will not apply to removable pavement marking materials.

MAINTENANCE OF THE PROJECT:

(11-20-07) (Rev. 1-17-12)

104-10

SP1 G125

Revise the 2018 Standard Specifications as follows:

Page 1-39, Article 104-10 Maintenance of the Project, line 25, add the following after the first sentence of the first paragraph:

All guardrail/guiderail within the project limits shall be included in this maintenance.

Page 1-39, Article 104-10 Maintenance of the Project, line 30, add the following as the last sentence of the first paragraph:

The Contractor shall perform weekly inspections of guardrail and guiderail and shall report damages to the Engineer on the same day of the weekly inspection. Where damaged guardrail or guiderail is repaired or replaced as a result of maintaining the project in accordance with this article, such repair or replacement shall be performed within 7 consecutive calendar days of such inspection report.

Page 1-39, Article 104-10 Maintenance of the Project, lines 42-44, replace the last sentence of the last paragraph with the following:

The Contractor will not be directly compensated for any maintenance operations necessary, except for maintenance of guardrail/guiderail, as this work will be considered incidental to the work covered by the various contract items. The provisions of Article 104-7, Extra Work, and Article 104-8, Compensation and Record Keeping will apply to authorized maintenance of guardrail/guiderail. Performance of weekly inspections of guardrail/guiderail, and the damage reports required as described above, will be considered to be an incidental part of the work being paid for by the various contract items.

COOPERATION BETWEEN CONTRACTORS:

(7-1-95) 105-7 SPI G133

The Contractor's attention is directed to Article 105-7 of the 2018 Standard Specifications.

W-5813J (DPOC - McDowell & Rutherford Counties) is located within the project limits of this project and is anticipated for a February 16, 2022 Division Letting.

The Contractor on this project shall cooperate with the Contractor working within or adjacent to the limits of this project to the extent that the work can be carried out to the best advantage of all concerned.

ELECTRONIC BIDDING:

(2-19-19) 101, 102, 103 SP1 G140

Revise the 2018 Standard Specifications as follows:

Page 1-4, Article 101-3, DEFINITIONS, BID (OR PROPOSAL) *Electronic Bid*, line 1, replace "Bid Express®" with "the approved electronic bidding provider".

Page 1-15, Subarticle 102-8(B), Electronic Bids, lines 39-40, replace "to Bid Express®" with "via the approved electronic bidding provider".

Page 1-15, Subarticle 102-8(B)(1), Electronic Bids, line 41, delete "from Bid Express®"

Page 1-17, Subarticle 102-9(C)(2), Electronic Bids, line 21, replace "Bid Express® miscellaneous folder within the .ebs" with "electronic submittal".

Page 1-29, Subarticle 103-4(C)(2), Electronic Bids, line 32, replace ".ebs miscellaneous data file of Expedite" with "electronic submittal file"

BID DOCUMENTATION:

(1-1-02) (Rev.8-18-15) 103 SPI G142

General

The successful Bidder (Contractor) shall submit the original, unaltered bid documentation or a certified copy of the original, unaltered bid documentation used to prepare the bid for this contract to the Department within 10 days after receipt of notice of award of contract. Such documentation shall be placed in escrow with a banking institution or other bonded document storage facility selected by the Department.

The Department will not execute the contract until the original, unaltered bid documentation or a certified copy of the original, unaltered bid documentation has been received by the Department. **Terms**

Bid Documentation - Bid Documentation shall mean all written information, working papers, computer printouts, electronic media, charts, and all other data compilations which contain or reflect information, data, and calculations used by the Bidder in the preparation of the bid. The term bid documentation includes, but is not limited to, contractor equipment rates, contractor overhead rates, labor rates, efficiency or productivity factors, arithmetical calculations, and quotations from subcontractors and material suppliers to the extent that such rates and quotations were used by the Bidder in formulating and determining the bid. The term bid documentation also includes any manuals, which are standard to the industry used by the Bidder in determining the bid. Such manuals may be included in the bid documentation by reference. Such reference shall include the name and date of the publication and the publisher. Bid Documentation does not include bid documents provided by the Department for use by the Bidder in bidding on this project. The Bid Documentation can be in the form of electronic submittal (i.e. thumb drive) or paper. If the Bidder elects to submit the Bid Documentation in electronic format, the Department requires a backup submittal (i.e. a second thumb drive) in case one is corrupted.

Contractor's Representative - Officer of the Contractor's company; if not an officer, the Contractor shall supply a letter signed and notarized by an officer of the Contractor's company, granting permission for the representative to sign the escrow agreement on behalf of the Contractor.

Escrow Agent - Officer of the select banking institution or other bonded document storage facility authorized to receive and release bid documentation.

Escrow Agreement Information

A draft copy of the Escrow Agreement will be mailed to the Bidder after the notice of award for informational purposes. The Bidder and Department will sign the actual Escrow Agreement at the time the bid documentation is delivered to the Escrow Agent.

Failure to Provide Bid Documentation

The Bidder's failure to provide the original, unaltered bid documentation or a certified copy of the original, unaltered bid documentation within 10 days after the notice of award is received may be just cause for rescinding the award of the contract and may result in the removal of the Bidder from the Department's list of qualified bidders for a period of up to 180 days. Award may then be

made to the next lowest responsible bidder or the work may be readvertised and constructed under the contract or otherwise, as the Department may decide.

Submittal of Bid Documentation

- (A) Appointment Email specs@ncdot.gov or call 919.707.6900 to schedule an appointment.
- (B) Delivery A representative of the Bidder shall deliver the original, unaltered bid documentation or a certified copy of the original, unaltered bid documentation to the Department, in a container suitable for sealing, within 10 days after the notice of award is received.
- (C) Packaging The container shall be no larger than 15.5 inches in length by 12 inches wide by 11 inches high and shall be water resistant. The container shall be clearly marked on the face and the back of the container with the following information: Bid Documentation, Bidder's Name, Bidder's Address, Date of Escrow Submittal, Contract Number, TIP Number if applicable, and County.

Affidavit

Bid documentation will be considered a certified copy if the Bidder includes an affidavit stating that the enclosed documentation is an EXACT copy of the original documentation used by the Bidder to determine the bid for this project. The affidavit shall also list each bid document with sufficient specificity so a comparison may be made between the list and the bid documentation to ensure that all of the bid documentation listed in the affidavit has been enclosed for escrow. The affidavit shall attest that the affiant has personally examined the bid documentation, that the affidavit lists all of the documents used by the Bidder to determine the bid for this project, and that all bid documentation has been included. The affidavit shall be signed by a chief officer of the company, have the person's name and title typed below the signature, and the signature shall be notarized at the bottom of the affidavit.

Verification

Upon delivery of the bid documentation, the Department's Contract Officer and the Bidder's representative will verify the accuracy and completeness of the bid documentation compared to the affidavit. Should a discrepancy exist, the Bidder's representative shall immediately furnish the Department's Contract Officer with any other needed bid documentation. The Department's Contract Officer upon determining that the bid documentation is complete will, in the presence of the Bidder's representative, immediately place the complete bid documentation and affidavit in the container and seal it. Both parties will deliver the sealed container to the Escrow Agent for placement in a safety deposit box, vault, or other secure accommodation.

Confidentiality of Bid Documentation

The bid documentation and affidavit in escrow are, and will remain, the property of the Bidder. The Department has no interest in, or right to, the bid documentation and affidavit other than to verify the contents and legibility of the bid documentation unless the Contractor gives written notice of intent to file a claim, files a written claim, files a written and verified claim, or initiates litigation against the Department. In the event of such written notice of intent to file a claim, filing of a written claim, filing a written and verified claim, or initiation of litigation against the Department, or receipt of a letter from the Contractor authorizing release, the bid documentation and affidavit may become the property of the Department for use in considering any claim or in litigation as the Department may deem appropriate.

Any portion or portions of the bid documentation designated by the Bidder as a *trade secret* at the time the bid documentation is delivered to the Department's Contract Officer shall be protected from disclosure as provided by *G.S. 132-1.2*.

Duration and Use

The bid documentation and affidavit shall remain in escrow until 60 calendar days from the time the Contractor receives the final estimate; or until such time as the Contractor:

- (A) Gives written notice of intent to file a claim,
- (B) Files a written claim,
- (C) Files a written and verified claim,
- (D) Initiates litigation against the Department related to the contract; or
- (E) Authorizes in writing its release.

Upon the giving of written notice of intent to file a claim, filing a written claim, filing a written and verified claim, or the initiation of litigation by the Contractor against the Department, or receipt of a letter from the Contractor authorizing release, the Department may obtain the release and custody of the bid documentation.

The Bidder certifies and agrees that the sealed container placed in escrow contains all of the bid documentation used to determine the bid and that no other bid documentation shall be relevant or material in litigation over claims brought by the Contractor arising out of this contract.

Release of Bid Documentation to the Contractor

If the bid documentation remains in escrow 60 calendar days after the time the Contractor receives the final estimate and the Contractor has not filed a written claim, filed a written and verified claim, or has not initiated litigation against the Department related to the contract, the Department will instruct the Escrow Agent to release the sealed container to the Contractor.

The Contractor will be notified by certified letter from the Escrow Agent that the bid documentation will be released to the Contractor. The Contractor or his representative shall retrieve the bid documentation from the Escrow Agent within 30 days of the receipt of the certified letter. If the Contractor does not receive the documents within 30 days of the receipt of the certified

letter, the Department will contact the Contractor to determine final dispersion of the bid documentation.

Payment

The cost of the escrow will be borne by the Department. There will be no separate payment for all costs of compilation of the data, container, or verification of the bid documentation. Payment at the various contract unit or lump sum prices in the contract will be full compensation for all such costs.

TWELVE MONTH GUARANTEE:

(7-15-03) 108 SP1 G145

- (A) The Contractor shall guarantee materials and workmanship against latent and patent defects arising from faulty materials, faulty workmanship or negligence for a period of twelve months following the date of final acceptance of the work for maintenance and shall replace such defective materials and workmanship without cost to the Department. The Contractor will not be responsible for damage due to faulty design, normal wear and tear, for negligence on the part of the Department, and/or for use in excess of the design.
- (B) Where items of equipment or material carry a manufacturer's guarantee for any period in excess of twelve months, then the manufacturer's guarantee shall apply for that particular piece of equipment or material. The Department's first remedy shall be through the manufacturer although the Contractor is responsible for invoking the warranted repair work with the manufacturer. The Contractor's responsibility shall be limited to the term of the manufacturer's guarantee. NCDOT would be afforded the same warranty as provided by the Manufacturer.

This guarantee provision shall be invoked only for major components of work in which the Contractor would be wholly responsible for under the terms of the contract. Examples would include pavement structures, bridge components, and sign structures. This provision will not be used as a mechanism to force the Contractor to return to the project to make repairs or perform additional work that the Department would normally compensate the Contractor for. In addition, routine maintenance activities (i.e. mowing grass, debris removal, ruts in earth shoulders,) are not parts of this guarantee.

Appropriate provisions of the payment and/or performance bonds shall cover this guarantee for the project.

To ensure uniform application statewide the Division Engineer will forward details regarding the circumstances surrounding any proposed guarantee repairs to the Chief Engineer for review and approval prior to the work being performed.

OUTSOURCING OUTSIDE THE USA:

(9-21-04) (Rev. 5-16-06)

SP1 G150

All work on consultant contracts, services contracts, and construction contracts shall be performed in the United States of America. No work shall be outsourced outside of the United States of America.

Outsourcing for the purpose of this provision is defined as the practice of subcontracting labor, work, services, staffing, or personnel to entities located outside of the United States.

The North Carolina Secretary of Transportation shall approve exceptions to this provision in writing.

EROSION AND SEDIMENT CONTROL/STORMWATER CERTIFICATION:

(1-16-07) (Rev 12-15-20)

105-16, 225-2, 16

SP1 G180

General

Schedule and conduct construction activities in a manner that will minimize soil erosion and the resulting sedimentation and turbidity of surface waters. Comply with the requirements herein regardless of whether or not a National Pollution discharge Elimination System (NPDES) permit for the work is required.

Establish a chain of responsibility for operations and subcontractors' operations to ensure that the *Erosion and Sediment Control/Stormwater Pollution Prevention Plan* is implemented and maintained over the life of the contract.

- (A) Certified Supervisor Provide a certified Erosion and Sediment Control/Stormwater Supervisor to manage the Contractor and subcontractor operations, insure compliance with Federal, State and Local ordinances and regulations, and manage the Quality Control Program.
- (B) Certified Foreman Provide a certified, trained foreman for each construction operation that increases the potential for soil erosion or the possible sedimentation and turbidity of surface waters.
- (C) Certified Installer Provide a certified installer to install or direct the installation for erosion or sediment/stormwater control practices.
- (D) Certified Designer Provide a certified designer for the design of the erosion and sediment control/stormwater component of reclamation plans and, if applicable, for the design of the project erosion and sediment control/stormwater plan.

Roles and Responsibilities

- (A) Certified Erosion and Sediment Control/Stormwater Supervisor The Certified Supervisor shall be Level II and responsible for ensuring the erosion and sediment control/stormwater plan is adequately implemented and maintained on the project and for conducting the quality control program. The Certified Supervisor shall be on the project within 24 hours notice from initial exposure of an erodible surface to the project's final acceptance. Perform the following duties:
 - (1) Manage Operations Coordinate and schedule the work of subcontractors so that erosion and sediment control/stormwater measures are fully executed for each operation and in a timely manner over the duration of the contract.

- (a) Oversee the work of subcontractors so that appropriate erosion and sediment control/stormwater preventive measures are conformed to at each stage of the work.
- (b) Prepare the required National Pollutant Discharge Elimination System (NPDES) Inspection Record and submit to the Engineer.
- (c) Attend all weekly or monthly construction meetings to discuss the findings of the NPDES inspection and other related issues.
- (d) Implement the erosion and sediment control/stormwater site plans requested.
- (e) Provide any needed erosion and sediment control/stormwater practices for the Contractor's temporary work not shown on the plans, such as, but not limited to work platforms, temporary construction, pumping operations, plant and storage yards, and cofferdams.
- (f) Acquire applicable permits and comply with requirements for borrow pits, dewatering, and any temporary work conducted by the Contractor in jurisdictional areas.
- (g) Conduct all erosion and sediment control/stormwater work in a timely and workmanlike manner.
- (h) Fully perform and install erosion and sediment control/stormwater work prior to any suspension of the work.
- (i) Coordinate with Department, Federal, State and Local Regulatory agencies on resolution of erosion and sediment control/stormwater issues due to the Contractor's operations.
- (j) Ensure that proper cleanup occurs from vehicle tracking on paved surfaces or any location where sediment leaves the Right-of-Way.
- (k) Have available a set of erosion and sediment control/stormwater plans that are initialed and include the installation date of Best Management Practices. These practices shall include temporary and permanent groundcover and be properly updated to reflect necessary plan and field changes for use and review by Department personnel as well as regulatory agencies.
- (2) Requirements set forth under the NPDES Permit The Department's NPDES Stormwater permit (NCS000250) outlines certain objectives and management measures pertaining to construction activities. The permit references NCG010000, General Permit to Discharge Stormwater under the NPDES, and states that the Department shall incorporate the applicable requirements into its delegated Erosion and Sediment Control Program for construction activities disturbing one or more acres of land. The Department further incorporates these requirements on all contracted bridge and culvert work at jurisdictional waters, regardless of size. Some of the requirements are, but are not limited to:
 - (a) Control project site waste to prevent contamination of surface or ground waters of the state, i.e. from equipment operation/maintenance, construction materials, concrete washout, chemicals, litter, fuels, lubricants, coolants, hydraulic fluids, any other petroleum products, and sanitary waste.
 - (b) Inspect erosion and sediment control/stormwater devices and stormwater discharge outfalls at least once every 7 calendar days and within 24 hours after a rainfall event equal to or greater than 1.0 inch that occurs within a 24

- hour period. Additional monitoring may be required at the discretion of Division of Water Resources personnel if the receiving stream is 303(d) listed for turbidity and the project has had documented problems managing turbidity.
- (c) Maintain an onsite rain gauge or use the Department's Multi-Sensor Precipitation Estimate website to maintain a daily record of rainfall amounts and dates.
- (d) Maintain erosion and sediment control/stormwater inspection records for review by Department and Regulatory personnel upon request.
- (e) Implement approved reclamation plans on all borrow pits, waste sites and staging areas.
- (f) Maintain a log of turbidity test results as outlined in the Department's Procedure for Monitoring Borrow Pit Discharge.
- (g) Provide secondary containment for bulk storage of liquid materials.
- (h) Provide training for employees concerning general erosion and sediment control/stormwater awareness, the Department's NPDES Stormwater Permit NCS000250 requirements, and the applicable requirements of the *General Permit, NCG010000*.
- (i) Report violations of the NPDES permit to the Engineer immediately who will notify the Division of Water Quality Regional Office within 24 hours of becoming aware of the violation.
- (3) Quality Control Program Maintain a quality control program to control erosion, prevent sedimentation and follow provisions/conditions of permits. The quality control program shall:
 - (a) Follow permit requirements related to the Contractor and subcontractors' construction activities.
 - (b) Ensure that all operators and subcontractors on site have the proper erosion and sediment control/stormwater certification.
 - (c) Notify the Engineer when the required certified erosion and sediment control/stormwater personnel are not available on the job site when needed.
 - (d) Conduct the inspections required by the NPDES permit.
 - (e) Take corrective actions in the proper timeframe as required by the NPDES permit for problem areas identified during the NPDES inspections.
 - (f) Incorporate erosion control into the work in a timely manner and stabilize disturbed areas with mulch/seed or vegetative cover on a section-by-section basis.
 - (g) Use flocculants approved by state regulatory authorities where appropriate and where required for turbidity and sedimentation reduction.
 - (h) Ensure proper installation and maintenance of temporary erosion and sediment control devices.
 - (i) Remove temporary erosion or sediment control devices when they are no longer necessary as agreed upon by the Engineer.
 - (j) The Contractor's quality control and inspection procedures shall be subject to review by the Engineer. Maintain NPDES inspection records and make records available at all times for verification by the Engineer.

- (B) Certified Foreman At least one Certified Foreman shall be onsite for each type of work listed herein during the respective construction activities to control erosion, prevent sedimentation and follow permit provisions:
 - (1) Foreman in charge of grading activities
 - (2) Foreman in charge of bridge or culvert construction over jurisdictional areas
 - (3) Foreman in charge of utility activities

The Contractor may request to use the same person as the Level II Supervisor and Level II Foreman. This person shall be onsite whenever construction activities as described above are taking place. This request shall be approved by the Engineer prior to work beginning.

The Contractor may request to name a single Level II Foreman to oversee multiple construction activities on small bridge or culvert replacement projects. This request shall be approved by the Engineer prior to work beginning.

- (C) *Certified Installers* Provide at least one onsite, Level I Certified Installer for each of the following erosion and sediment control/stormwater crew:
 - (1) Seeding and Mulching
 - (2) Temporary Seeding
 - (3) Temporary Mulching
 - (4) Sodding
 - (5) Silt fence or other perimeter erosion/sediment control device installations
 - (6) Erosion control blanket installation
 - (7) Hydraulic tackifier installation
 - (8) Turbidity curtain installation
 - (9) Rock ditch check/sediment dam installation
 - (10) Ditch liner/matting installation
 - (11) Inlet protection
 - (12) Riprap placement
 - (13) Stormwater BMP installations (such as but not limited to level spreaders, retention/detention devices)
 - (14) Pipe installations within jurisdictional areas

If a Level I *Certified Installer* is not onsite, the Contractor may substitute a Level II Foreman for a Level I Installer, provided the Level II Foreman is not tasked to another crew requiring Level II Foreman oversight.

(D) Certified Designer - Include the certification number of the Level III Certified Designer on the erosion and sediment control/stormwater component of all reclamation plans and if applicable, the certification number of the Level III Certified Designer on the design of the project erosion and sediment control/stormwater plan.

Preconstruction Meeting

Furnish the names of the *Certified Erosion and Sediment Control/Stormwater Supervisor*, *Certified Foremen*, *Certified Installers* and *Certified Designer* and notify the Engineer of changes in certified personnel over the life of the contract within 2 days of change.

Ethical Responsibility

Any company performing work for the North Carolina Department of Transportation has the ethical responsibility to fully disclose any reprimand or dismissal of an employee resulting from improper testing or falsification of records.

Revocation or Suspension of Certification

Upon recommendation of the Chief Engineer to the certification entity, certification for Supervisor, Certified Foremen, Certified Installers and Certified Designer may be revoked or suspended with the issuance of an Immediate Corrective Action (ICA), Notice of Violation (NOV), or Cease and Desist Order for erosion and sediment control/stormwater related issues.

The Chief Engineer may recommend suspension or permanent revocation of certification due to the following:

- (A) Failure to adequately perform the duties as defined within this certification provision.
- (B) Issuance of an ICA, NOV, or Cease and Desist Order.
- (C) Failure to fully perform environmental commitments as detailed within the permit conditions and specifications.
- (D) Demonstration of erroneous documentation or reporting techniques.
- (E) Cheating or copying another candidate's work on an examination.
- (F) Intentional falsification of records.
- (G) Directing a subordinate under direct or indirect supervision to perform any of the above actions.
- (H) Dismissal from a company for any of the above reasons.
- (I) Suspension or revocation of one's certification by another entity.

Suspension or revocation of a certification will be sent by certified mail to the certificant and the Corporate Head of the company that employs the certificant.

A certificant has the right to appeal any adverse action which results in suspension or permanent revocation of certification by responding, in writing, to the Chief Engineer within 10 calendar days after receiving notice of the proposed adverse action.

Chief Engineer 1536 Mail Service Center Raleigh, NC 27699-1536

Failure to appeal within 10 calendar days will result in the proposed adverse action becoming effective on the date specified on the certified notice. Failure to appeal within the time specified

will result in a waiver of all future appeal rights regarding the adverse action taken. The certificant will not be allowed to perform duties associated with the certification during the appeal process.

The Chief Engineer will hear the appeal and make a decision within 7 days of hearing the appeal. Decision of the Chief Engineer will be final and will be made in writing to the certificant.

If a certification is temporarily suspended, the certificant shall pass any applicable written examination and any proficiency examination, at the conclusion of the specified suspension period, prior to having the certification reinstated.

Measurement and Payment

Certified Erosion and Sediment Control/Stormwater Supervisor, Certified Foremen, Certified Installers and Certified Designer will be incidental to the project for which no direct compensation will be made.

PROCEDURE FOR MONITORING BORROW PIT DISCHARGE:

(2-20-07) (Rev. 4-5-19)

105-16, 230, 801

SP1 G181

Water discharge from borrow pit sites shall not cause surface waters to exceed 50 NTUs (nephelometric turbidity unit) in streams not designated as trout waters and 10 NTUs in streams, lakes or reservoirs designated as trout waters. For lakes and reservoirs not designated as trout waters, the turbidity shall not exceed 25 NTUs. If the turbidity exceeds these levels due to natural background conditions, the existing turbidity level shall not be increased.

If during any operating day, the downstream water quality exceeds the standard, the Contractor shall do all of the following:

- (A) Either cease discharge or modify the discharge volume or turbidity levels to bring the downstream turbidity levels into compliance, or
- (B) Evaluate the upstream conditions to determine if the exceedance of the standard is due to natural background conditions. If the background turbidity measurements exceed the standard, operation of the pit and discharge can continue as long as the stream turbidity levels are not increased due to the discharge.
- (C) Measure and record the turbidity test results (time, date and sampler) at all defined sampling locations 30 minutes after startup and at a minimum, one additional sampling of all sampling locations during that 24-hour period in which the borrow pit is discharging.
- (D) Notify DWQ within 24 hours of any stream turbidity standard exceedances that are not brought into compliance.

During the Environmental Assessment required by Article 230-4 of the 2018 Standard Specifications, the Contractor shall define the point at which the discharge enters into the State's surface waters and the appropriate sampling locations. Sampling locations shall include points upstream and downstream from the point at which the discharge enters these waters. Upstream sampling location shall be located so that it is not influenced by backwater conditions and

represents natural background conditions. Downstream sampling location shall be located at the point where complete mixing of the discharge and receiving water has occurred.

The discharge shall be closely monitored when water from the dewatering activities is introduced into jurisdictional wetlands. Any time visible sedimentation (deposition of sediment) on the wetland surface is observed, the dewatering activity will be suspended until turbidity levels in the stilling basin can be reduced to a level where sediment deposition does not occur. Staining of wetland surfaces from suspended clay particles, occurring after evaporation or infiltration, does not constitute sedimentation. No activities shall occur in wetlands that adversely affect the functioning of a wetland. Visible sedimentation will be considered an indication of possible adverse impacts on wetland use.

The Engineer will perform independent turbidity tests on a random basis. These results will be maintained in a log within the project records. Records will include, at a minimum, turbidity test results, time, date and name of sampler. Should the Department's test results exceed those of the Contractor's test results, an immediate test shall be performed jointly with the results superseding the previous test results of both the Department and the Contractor.

The Contractor shall use the NCDOT Turbidity Reduction Options for Borrow Pits Matrix, available at https://connect.ncdot.gov/resources/roadside/FieldOperationsDocuments/TurbidityReductionOptionSheet.pdf to plan, design, construct, and maintain BMPs to address water quality standards. Tier I Methods include stilling basins which are standard compensatory BMPs. Other Tier I methods are noncompensatory and shall be used when needed to meet the stream turbidity standards. Tier II Methods are also noncompensatory and are options that may be needed for protection of rare or unique resources or where special environmental conditions exist at the site which have led to additional requirements being placed in the DWQ's 401 Certifications and approval letters, Isolated Wetland Permits, Riparian Buffer Authorization or a DOT Reclamation Plan's Environmental Assessment for the specific site. Should the Contractor exhaust all Tier I Methods on a site exclusive of rare or unique resources or special environmental conditions, Tier II Methods may be required by regulators on a case by case basis per supplemental agreement.

The Contractor may use cation exchange capacity (CEC) values from proposed site borings to plan and develop the bid for the project. CEC values exceeding 15 milliequivalents per 100 grams of soil may indicate a high potential for turbidity and should be avoided when dewatering into surface water is proposed.

No additional compensation for monitoring borrow pit discharge will be paid.

NOTE TO CONTRACTOR:

The Department has submitted a permit modification for R-2233BB for two additional sites located between Sta. 731+35.44 and Sta. 739+50. The contractor shall perform no work from Sta. 731+35.44 to Sta. 739+50 until the Department receives the approved permit modification from the US Corps of Engineers.

PROJECT SPECIAL PROVISIONS

ROADWAY

CLEARING AND GRUBBING - METHOD II:

(9-17-02) (Rev.8-18-15) 200

SP2 R02A

Perform clearing on this project to the limits established by Method "II" shown on Standard Drawing No. 200.02 of the 2018 Roadway Standard Drawings. Conventional clearing methods may be used except where permit drawings or conditions have been included in the proposal which require certain areas to be cleared by hand methods.

TEMPORARY DETOURS:

(7-1-95) (Rev. 11-19-13) 1101 SP2 R30B

Construct temporary detours required on this project in accordance with the typical sections in the plans or as directed.

After the detours have served their purpose, remove the portions deemed unsuitable for use as a permanent part of the project as directed by the Engineer. Salvage and stockpile the aggregate base course removed from the detours at locations within the right of way, as directed by the Engineer, for removal by State Forces. Place pavement and earth material removed from the detour in embankments or dispose of in waste areas furnished by the Contractor.

Aggregate base course and earth material that is removed will be measured and will be paid at the contract unit price per cubic yard for *Unclassified Excavation*. Pavement that is removed will be measured and will be paid at the contract unit price per square yard for *Removal of Existing Pavement*. Pipe culverts removed from the detours remain the property of the Contractor. Pipe culverts that are removed will be measured and will be paid at the contract unit price per linear foot for *Pipe Removal*. Payment for the construction of the detours will be made at the contract unit prices for the various items involved.

Such prices and payments will be full compensation for constructing the detours and for the work of removing, salvaging, and stockpiling aggregate base course; removing pipe culverts; and for placing earth material and pavement in embankments or disposing of earth material and pavement in waste areas.

SHOULDER AND FILL SLOPE MATERIAL:

(5-21-02) 235, 560

SP2 R45 B

Description

Perform the required shoulder and slope construction for this project in accordance with the applicable requirements of Section 560 and Section 235 of the 2018 Standard Specifications.

Measurement and Payment

When the Contractor elects to obtain material from an area located beneath a proposed fill sections which does not require excavation for any reason other than to generate acceptable shoulder and fill slope material, the work of performing the excavation will be considered incidental to the item

of Borrow Excavation or Shoulder Borrow. If there is no pay item for Borrow or Shoulder Borrow in the contract, this work will be considered incidental to Unclassified Excavation. Stockpile the excavated material in a manner to facilitate measurement by the Engineer. Fill the void created by the excavation of the shoulder and fill slope material with suitable material. Payment for material used from the stockpile will be made at the contract unit price for Borrow Excavation or Shoulder Borrow. If there is no pay item for Borrow Excavation or Shoulder Borrow, then the material will be paid for at the contract unit price for Unclassified Excavation. The material used to fill the void created by the excavation of the shoulder and fill slope material will be made at the contract unit price for Unclassified Excavation, Borrow Excavation, or Shoulder Borrow, depending on the source of the material.

Material generated from undercut excavation, unclassified excavation or clearing and grubbing operations that is placed directly on shoulders or slope areas, will not be measured separately for payment, as payment for the work requiring the excavation will be considered adequate compensation for depositing and grading the material on the shoulders or slopes.

When undercut excavation is performed at the direction of the Engineer and the material excavated is found to be suitable for use as shoulder and fill slope material, and there is no area on the project currently prepared to receive the material generated by the undercut operation, the Contractor may construct a stockpile for use as borrow at a later date. Payment for the material used from the stockpile will be made at the contract unit price for *Borrow Excavation* or *Shoulder Borrow*.

When shoulder material is obtained from borrow sources or from stockpiled material, payment for the work of shoulder construction will be made at the contract unit price per cubic yard for *Borrow Excavation* or *Shoulder Borrow* in accordance with the applicable provisions of Section 230 or Section 560 of the 2018 Standard Specifications.

FLOWABLE FILL:

(9-17-02) (Rev 1-17-12)

300, 340, 1000, 1530, 1540, 1550

SP3 R30

Description

This work consists of all work necessary to place flowable fill in accordance with these provisions, the plans, and as directed.

Materials

Refer to Division 10 of the 2018 Standard Specifications.

ItemSectionFlowable Fill1000-6

Construction Methods

Discharge flowable fill material directly from the truck into the space to be filled, or by other approved methods. The mix may be placed full depth or in lifts as site conditions dictate. The Contractor shall provide a method to plug the ends of the existing pipe in order to contain the flowable fill.

Measurement and Payment

At locations where flowable fill is called for on the plans and a pay item for flowable fill is included in the contract, *Flowable Fill* will be measured in cubic yards and paid as the actual number of cubic yards that have been satisfactorily placed and accepted. Such price and payment will be full compensation for all work covered by this provision including, but not limited to, the mix design, furnishing, hauling, placing and containing the flowable fill.

Payment will be made under:

Pay ItemPay UnitFlowable FillCubic Yard

CORRUGATED ALUMINUM ALLOY CULVERT PIPE:

(9-21-21) 305, 310 SP3 R34

Revise the *Standard Specifications* as follows:

Page 3-5, Article 305-2, MATERIALS, add the following after line 16:

Item	Section
Waterborne Paint	1080-9
Hot Bitumen	1081-3

Page 3-5, Article 305-3, CONSTRUCTION METHODS, add the following after line 24:

Coating must be applied to the aluminum when in contact with concrete. Immediately prior to coating, aluminum surfaces to be coated shall be cleaned by a method that will remove all dirt, oil, grease, chips, and other foreign substances. Aluminum to be coated shall be given one coat of suitable quality coating such as:

Approved Waterborne paint (Section 1080-9) Approved Hot Bitumen (Section 1081-3)

Other coating materials may be submitted to the Engineer for approval.

Page 3-7, Article 310-6, MEASUREMENT AND PAYMENT, lines 6-11, delete the fourth sentence and replace with the following:

Select bedding and backfill material and coating will be included in the cost of the installed pipe. Such price and payment will be full compensation for all materials, labor, equipment, and other incidentals necessary to complete the work.

POLYPROPYLENE CULVERT PIPE:

(8-20-19) 305,310 SP3 R35

Revise the 2018 Standard Specifications as follows:

Page 3-5, Article 305-1 DESCRIPTION, lines 12-14, replace with the following:

Where shown in the plans, the Contractor may use reinforced concrete pipe, aluminum alloy pipe, aluminized corrugated steel pipe, HDPE pipe, Polypropylene Pipe, or PVC pipe in accordance with the following requirements.

Page 3-5, Article 305-2 MATERIALS, add the following after line 16:

ItemSectionPolypropylene Pipe1032-9

Page 3-6, Article 310-2 MATERIALS, add the following after line 9:

ItemSectionPolypropylene Pipe1032-9

Page 3-6, Article 310-4 SIDE DRAIN PIPE, lines 24-25, replace the first sentence of the second paragraph with the following:

Where shown in the plans, side drain pipe may be Class II reinforced concrete pipe, aluminized corrugated steel pipe, corrugated aluminum alloy pipe, polypropylene pipe, HDPE pipe or PVC pipe.

Page 3-7, Article 310-5 PIPE END SECTIONS, lines 2-4, replace the second sentence with the following:

Both corrugated steel and concrete pipe end sections will work on concrete pipe, corrugated steel pipe, polypropylene pipe, and HDPE smooth lined corrugated plastic pipe.

Page 3-7, Article 310-6 MEASUREMENT AND PAYMENT, add the following after line 14:

Pay Item	Pay Unit
" Polypropylene Pipe	Linear Foot

Page 10-60, add Article 1032-9:

(A) General

Use polypropylene pipe from sources participating in the Department's Polypropylene Pipe QA/QC Program. A list of participating sources is available from the Materials and Tests Unit. The Department will remove a manufacturer of polypropylene pipe from this program if the monitoring efforts indicated that non-specification material is being provided or test procedures are not being followed.

Use polypropylene culvert pipe that meets AASHTO M 330 for Type S or Type D, or ASTM F2881 or ASTM F2764 Double or Triple wall; and has been evaluated by NTPEP.

(B) End Treatments, Pipe Tees and Elbows

End treatments, pipe tees and elbows shall meet AASHTO M 330, Section 7.7, or ASTM

F2764, Section 6.6.

(C) Marking

Clearly mark each section of pipe, end section, tee and elbow and other accessories according to the Department's Polypropylene Pipe QC/QA Program:

- (1) AASHTO or ASTM Designation
- (2) The date of manufacture
- (3) Name or trademark of the manufacturer

When polypropylene pipe, end sections, tees and elbows have been inspected and accepted a sticker will be applied to the inside of the pipe. Do no use pipe sections, flared end sections, tees or elbows which do not have this seal of approval.

ENERGY DISSIPATOR BASIN:

(10-14-09) (Rev. 2-7-14) Rev.

Description

This work consists of the construction and maintenance of an armored outlet structure located at culvert outlets or ditch termini.

Materials

Refer to Division 10 of the 2018 Standard Specifications.

Item	Section
Class B, Class I and Class II Riprap	1042
Geotextile for Drainage, Type 2	1056

Construction Methods

Energy dissipators shall be constructed in accordance with the detail shown in the plans or as directed. From the outlet, invert of a culvert or bottom of a ditch excavation will drop to a specified depth. Excavation will continue to widen through the dissipator. Riprap shall be placed along the banks and bottom of the dissipator and along the apron.

Excavate ditch in accordance with Section 240 of the 2018 Standard Specifications.

The quantity of energy dissipator material may be affected by site conditions during construction of the project. The quantity of materials may be increased, decreased, or eliminated at the direction of the Engineer. Such variations in quantity will not be considered as alterations in the details of construction or a change in the character of the work.

Measurement and Payment

Energy Dissipator Basin will be measured and paid for in units of each. Such price and payment will be full compensation for all work covered by this section, including, but not limited to,

furnishing and placing stone, geotextile for drainage type 2, materials, labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

Pay ItemPay UnitEnergy Dissipator BasinEach

BRIDGE APPROACH FILLS:

(10-19-10) (Rev. 1-16-18) 422 SP4 R02A (Rev)

Description

Bridge approach fills consist of backfilling behind bridge end bents with select material or aggregate to support all or portions of bridge approach slabs. Install drains to drain water from bridge approach fills and geotextiles to separate approach fills from embankment fills, ABC and natural ground as required. When bridge approach fills occur behind end bents with mechanically stabilized earth (MSE) abutment walls and when required on plans reinforce bridge approach fills with MSE wall reinforcement connected to end bent caps. Construct bridge approach fills in accordance with the contract, accepted submittals and 2018 Roadway Standard Drawing Nos. 422.01 or 422.02 or Roadway Detail Drawing No. 422D10.

Define bridge approach fill types as follows:

Approach Fills – Bridge approach fills in accordance with 2018 Roadway Standard Drawing Nos. 422.01 or 422.02 or Roadway Detail Drawing No. 422D10,

Standard Approach Fill – Type I Standard Bridge Approach Fill in accordance with 2018 Roadway Standard Drawing No. 422.01,

Modified Approach Fill – Type II Modified Bridge Approach Fill in accordance with 2018 Roadway Standard Drawing No. 422.02 and

Reinforced Approach Fill – Type III Reinforced Bridge Approach Fill in accordance with Roadway Detail Drawing No. 422D10.

Materials

Refer to Division 10 of the 2018 Standard Specifications.

Item	Section
Geotextiles, Type 1	1056
Portland Cement Concrete	1000
Select Materials	1016
Subsurface Drainage Materials	1044

Provide Type 1 geotextile for separation geotextiles and Class B concrete for outlet pads. Use Class V or Class VI select material for standard and modified approach fills. For an approach fill behind a bridge end bent with an MSE abutment wall, backfill the reinforced approach fill with the same aggregate type approved for the reinforced zone in the accepted MSE wall submittal. For MSE wall aggregate, reinforcement and connector materials, see the *Mechanically Stabilized Earth Retaining Walls* provision. Provide PVC pipes, fittings and outlet pipes for subsurface drainage materials. For PVC drain pipes, use pipes with perforations that meet AASHTO M 278.

Construction Methods

Excavate as necessary for approach fills in accordance with the contract. Notify the Engineer when foundation excavation is complete. Do not place separation geotextiles or aggregate until approach fill dimensions and foundation material are approved.

When required for reinforced approach fills, cast MSE wall reinforcement or connectors into end bent cap backwalls within 3" of locations shown in the accepted MSE wall submittals. Install MSE wall reinforcement with the orientation, dimensions and number of layers shown in the accepted MSE wall submittals. If a reinforced approach fill is designed with geogrid reinforcement embedded in an end bent cap, cut geogrids to the required lengths and after securing ends of geogrids in place, reroll and rewrap portions of geogrids not embedded in the cap to protect geogrids from damage. Before placing aggregate, pull geosynthetic reinforcement taut so that it is in tension and free of kinks, folds, wrinkles or creases.

Attach separation geotextiles to end bent cap backwalls and wing walls with adhesives, tapes or other approved methods. Overlap adjacent separation geotextiles at least 18" with seams oriented parallel to the roadway centerline. Hold geotextiles in place with wire staples or anchor pins as needed. Contact the Engineer when existing or future obstructions such as foundations, pavements, pipes, inlets or utilities will interfere with separation geotextiles or MSE wall reinforcement.

Install continuous perforated PVC drain pipes with perforations pointing down in accordance with 2018 Roadway Standard Drawing Nos. 422.01 or 422.02. Connect drain pipes to outlet pipes just beyond wing walls. Connect PVC pipes, fittings and outlet pipes with solvent cement in accordance with Article 815-3 of the *2018 Standard Specifications* and place outlet pads in accordance with 2018 Roadway Standard Drawing No. 815.03.

Install drain pipes so water drains towards outlets. If the groundwater elevation is above drain pipe elevations, raise drains up to maintain positive drainage towards outlets. Place pipe sleeves in or under wing walls so water drains towards outlets. Use sleeves that can withstand wing wall loads.

Place select material or aggregate in 8" to 10" thick lifts. Compact fine aggregate for reinforced approach fills in accordance with Subarticle 235-3(C) of the 2018 Standard Specifications except compact fine aggregate to a density of at least 98%. Compact select material for standard or modified approach fills and coarse aggregate for reinforced approach fills with a vibratory compactor to the satisfaction of the Engineer. Do not displace or damage geosynthetics, MSE wall reinforcement or drains when placing and compacting select material or aggregate. End dumping directly on geosynthetics is not permitted. Do not operate heavy equipment on geosynthetics or drain pipes until they are covered with at least 8" of select material or aggregate. Replace any damaged geosynthetics or drains to the satisfaction of the Engineer. When approach fills extend beyond bridge approach slabs, wrap separation geotextiles over select material or aggregate as shown in 2018 Roadway Standard Drawing No. 422.01 or 2018 Roadway Detail Drawing No. 422D10.

Measurement and Payment

Type I Standard Approach Fill, Station, Ty	pe II Modified Approach Fill, Station and		
Type III Reinforced Approach Fill, Station	will be paid at the contract lump sum price. The		
lump sum price for each approach fill will be	full compensation for providing labor, tools,		
equipment and approach fill materials, excavating	g, backfilling, hauling and removing excavated		
materials, installing geotextiles and drains, com	pacting backfill and supplying select material,		
aggregate, separation geotextiles, drain pipes,	pipe sleeves, outlet pipes and pads and any		
incidentals necessary to construct approach fills b	behind bridge end bents.		
If required, the contract lump sum price for <i>Type</i>	·		
also be full compensation for supplying and connecting MSE wall reinforcement to end bent caps			
but not designing MSE wall reinforcement and connectors If required on plans, the cost of designing reinforcement and connectors for reinforced approach fills behind bridge end bents with			
MSE abutment walls will be incidental to the con	tract unit price for MSE Retaining Wall No		
Payment will be made under:			
Pay Item	Pay Unit		
Type I Standard Approach Fill, Station	Lump Sum		
Type II Modified Approach Fill, Station	Lump Sum		

Lump Sum

SP4 R02B

ALTERNATE BRIDGE APPROACH FILLS FOR INTEGRAL ABUTMENTS:

Description

At the Contractors option, use Type A Alternate Bridge Approach Fills instead of Type I or II Bridge Approach Fills to support bridge approach slabs for integral bridge abutments. An alternate bridge approach fill consists of constructing an approach fill with a temporary geotextile wall before placing all or a portion of the concrete for the backwall and wing walls of the integral end bent cap. The temporary geotextile wall is designed for a crane surcharge, remains in place and aligned so the wall face functions as a form for the end bent cap backwall and wing walls. Install drains, welded wire facing and geotextiles and backfill approach fills and temporary walls with select material as required. Define "geotextiles" as separation or reinforcement geotextiles, "temporary wall" as a temporary geotextile wall and "alternate approach fill" as a Type A Alternate Bridge Approach Fill in accordance with 2018 Roadway Standard Drawing No. 422.03.

Materials

Refer to Division 10 of the 2018 Standard Specifications.

Type III Reinforced Approach Fill, Station

Item	Section
Geotextiles	1056
Portland Cement Concrete	1000
Select Materials	1016
Subsurface Drainage Materials	1044
Welded Wire Reinforcement	1070-3

For temporary walls, use welded wire reinforcement for welded wire facing and Type 5 geotextile for reinforcement geotextiles. Use Type 5 geotextile with lengths and an ultimate tensile strength as shown in 2018 Roadway Standard Drawing No. 422.03. Provide Type 1 geotextile for separation geotextiles and Class B concrete for outlet pads. Use Class V or Class VI select material for alternate approach fills and temporary walls. Provide PVC pipes, fittings and outlet pipes for subsurface drainage materials. For PVC drain pipes, use pipes with perforations that meet AASHTO M 278.

Construction Methods

Excavate as necessary for alternate approach fills and temporary walls in accordance with the contract. Notify the Engineer when foundation excavation is complete. Do not place geotextiles until approach fill dimensions and foundation material are approved.

Install geotextiles as shown in 2018 Roadway Standard Drawing No. 422.03. Attach separation geotextiles to end bent cap backwalls and wing walls as needed with adhesives, tapes or other approved methods. Overlap adjacent geotextiles at least 18" with seams oriented parallel to the roadway centerline. Hold geotextiles in place with wire staples or anchor pins as needed. Contact the Engineer when existing or future obstructions such as foundations, pavements, pipes, inlets or utilities will interfere with geotextiles.

Install continuous perforated PVC drain pipes with perforations pointing down in accordance with 2018 Roadway Standard Drawing No. 422.03. Connect drain pipes to outlet pipes just beyond wing walls. Connect PVC pipes, fittings and outlet pipes with solvent cement in accordance with Article 815-3 of the 2018 Standard Specifications and place outlet pads in accordance with 2018 Roadway Standard Drawing No. 815.03.

Install drain pipes so water drains towards outlets. If the groundwater elevation is above drain pipe elevations, raise drains up to maintain positive drainage towards outlets. Place pipe sleeves in or under wing walls so water drains towards outlets. Use sleeves that can withstand wing wall loads.

At the Contractor's option, construct bottom portion of integral end bents before temporary walls as shown in 2018 Roadway Standard Drawings No. 422.03. Erect and set welded wire facing so facing functions as a form for the end bent cap backwall. Place welded wire facing adjacent to each other in the horizontal and vertical directions to completely cover the temporary wall face. Stagger welded wire facing to create a running bond by centering facing over joints in the row below.

Wrap reinforcement geotextiles at the temporary wall face in accordance with 2018 Roadway Standard Drawing No. 422.03 and cover geotextiles with at least 3" of select material. Place layers of reinforcement geotextiles within 3" of locations shown in 2018 Roadway Standard Drawing No. 422.03. Before placing select material, pull reinforcement geotextiles taut so they are in tension and free of kinks, folds, wrinkles or creases. Install reinforcement geotextiles with the direction shown in 2018 Roadway Standard Drawing No. 422.03. Do not splice or overlap reinforcement geotextiles so seams are parallel to the temporary wall face.

Place select material in 8" to 10" thick lifts and compact select material with a vibratory compactor to the satisfaction of the Engineer. Do not displace or damage geotextiles or drains when placing

and compacting select material. End dumping directly on geotextiles is not permitted. Do not operate heavy equipment on geotextiles or drain pipes until they are covered with at least 8" of select material. Replace any damaged geotextiles or drains to the satisfaction of the Engineer. When alternate approach fills extend beyond bridge approach slabs, wrap separation geotextiles over select material as shown in 2018 Roadway Standard Drawing No. 422.03.

Temporary walls are designed for a surcharge pressure in accordance with 2018 Roadway Standard Drawing No. 422.03. If the crane surcharge will exceed the wall design, contact the Engineer before positioning the crane over reinforcement geotextiles.

Measurement and Payment

Alternate approach fills will be paid at the contract lump sum for either *Type I Standard Approach Fill, Station* or *Type II Modified Approach Fill, Station* based on the approach fill type that the alternate approach fill is replacing. The lump sum price for each approach fill will be full compensation for providing labor, tools, equipment and alternate approach fill materials, excavating, backfilling, hauling and removing excavated materials, constructing temporary walls, installing wall facing, geotextiles and drains, compacting backfill and supplying select material, separation and reinforcement geotextiles, welded wire facing, drain pipes, pipe sleeves, outlet pipes and pads and any incidentals necessary to construct alternate approach fills for integral abutments.

AUTOMATED FINE GRADING:

(1-16-96) 610 SP5 R05

On mainline portions and ramps of this project, prepare the subgrade and base beneath the pavement structure in accordance with the applicable sections of the 2018 Standard Specifications except use an automatically controlled fine grading machine using string lines, laser controls or other approved methods to produce final subgrade and base surfaces meeting the lines, grades and cross sections required by the plans or established by the Engineer.

No direct payment will be made for the work required by this provision as it will be considered incidental to other work being paid for by the various items in the contract.

AGGREGATE SUBGRADE:

(5-15-18) 505 SP5 R8

Revise the 2018 Standard Specifications as follows:

Page 5-8, Article 505-1 DESCRIPTION, lines 4-6, replace the paragraph with the following:

Construct aggregate subgrades in accordance with the contract. Install geotextile for soil stabilization and place Class IV subgrade stabilization at locations shown in the plans and as directed.

Undercut natural soil materials if necessary to construct aggregate subgrades. Define "subbase" as the portion of the roadbed below the Class IV subgrade stabilization. For Type 2 aggregate subgrades, undercut subbases as needed. The types of aggregate subgrade with thickness and compaction requirements for each are as shown below.

Type 1 – A 6 to 24 inch thick aggregate subgrade with Class IV subgrade stabilization compacted to 92% of AASHTO T 180 as modified by the Department or to the highest density that can be reasonably obtained.

Type 2 – An 8 inch thick aggregate subgrade on a proof rolled subbase with Class IV subgrade stabilization compacted to 97% of AASHTO T 180 as modified by the Department.

Page 5-8, Article 505-3 CONSTRUCTION METHODS, line 12, insert the following after the first sentence of the first paragraph:

For Type 2 aggregate subgrades, proof roll subbases in accordance with Section 260 before installing geotextile for soil stabilization.

Page 5-8, Article 505-3 CONSTRUCTION METHODS, lines 16-17, replace the last sentence of the first paragraph with the following:

Compact ABC as required for the type of aggregate subgrade constructed.

Page 5-8, Article 505-4 MEASUREMENT AND PAYMENT, line 26, insert the following after the last sentence of the first paragraph:

Undercut Excavation of natural soil materials from subbases for Type 2 aggregate subgrades will be measured and paid in accordance with Article 225-7 or 226-3. No measurement will be made for any undercut excavation of fill materials from subbases.

PRICE ADJUSTMENT - ASPHALT BINDER FOR PLANT MIX:

(11-21-00)

SP6 R25

Price adjustments for asphalt binder for plant mix will be made in accordance with Section 620 of the 2018 Standard Specifications.

The base price index for asphalt binder for plant mix is \$ 502.73 per ton.

This base price index represents an average of F.O.B. selling prices of asphalt binder at supplier's terminals on October 1, 2021.

607

MILLING ASPHALT PAVEMENT:

(1-15-19)

SP6 R59

Revise the 2018 Standard Specifications as follows:

Page 6-5, Article 607-2, EQUIPMENT, lines 14-16, delete the seventh sentence of this Article and replace with the following:

Use either a non-contacting laser or sonar type ski system with a minimum of three referencing stations mounted on the milling machine at a length of at least 24 feet.

ASPHALT CONCRETE PLANT MIX PAVEMENTS:

(2-20-18) (Rev.1-15-19) 610, 1012 SP6 R65

Revise the 2018 Standard Specifications as follows:

Page 6-14, Table 609-3, LIMITS OF PRECISION FOR TEST RESULTS, replace with the following:

TABLE 609-3 LIMITS OF PRECISION FOR TEST RESULTS			
Mix Property	Limits of Precision		
25.0 mm sieve (Base Mix) $\pm 10.0\%$			
19.0 mm sieve (Base Mix)	± 10.0%		
12.5 mm sieve (Intermediate & Type P-57)	$\pm~6.0\%$		
9.5 mm sieve (Surface Mix)	± 5.0%		
4.75 mm sieve (Surface Mix)	± 5.0%		
2.36 mm sieve (All Mixes, except S4.75A)	± 5.0%		
1.18 mm sieve (S4.75A)	± 5.0%		
0.075 mm sieve (All Mixes)	$\pm2.0\%$		
Asphalt Binder Content	$\pm0.5\%$		
Maximum Specific Gravity (Gmm)	$\pm \ 0.020$		
Bulk Specific Gravity (Gmb)	± 0.030		
TSR	± 15.0%		
QA retest of prepared QC Gyratory Compacted Volumetric Specimens	± 0.015		
Retest of QC Core Sample	± 1.2% (% Compaction)		
Comparison QA Core Sample	± 2.0% (% Compaction)		
QA Verification Core Sample	± 2.0% (% Compaction)		
Density Gauge Comparison of QC Test	± 2.0% (% Compaction)		
QA Density Gauge Verification Test	± 2.0% (% Compaction)		

Page 6-17, Table 610-1, MIXING TEMPERATURE AT THE ASPHALT PLANT, replace with the following:

TABLE 610-1		
MIXING TEMPERATURE AT THE ASPHALT PLANT		
Binder Grade	JMF Temperature	
PG 58-28; PG 64-22	250 - 290°F	
PG 76-22	300 - 325°F	

Page 6-17, Subarticle 610-3(C), Job Mix Formula (JMF), lines 38-39, delete the fourth paragraph.

Page 6-18, Subarticle 610-3(C), Job Mix Formula (JMF), line 12, replace "SF9.5A" with "S9.5B".

Page 6-18, Table 610-3, MIX DESIGN CRITERIA, replace with the following:

TABLE 610-3
I ADLE 010-3
MAN DEGLON ODMEDIA
MIX DESIGN CRITERIA

Mix	Design	Binder	Comp Lev	action /els	Max. Rut	Volumetric Properties ³			
Type	ESALs millions ^A	PG Grade	Gmr	n (a)	Depth	VMA	VTM	VFA	%G _{mm}
	IIIIIIIIIIII	Grade	Nini	N _{des}	(mm)	% Min.	%	MinMax.	@ Nini
S4.75A	< 1	64 - 22	6	50	11.5	16.0	4.0 - 6.0	65 - 80	≤ 91.5
S9.5B	0 - 3	64 - 22	6	50	9.5	16.0	3.0 - 5.0	70 - 80	≤ 91.5
S9.5C	3 - 30	64 - 22	7	65	6.5	15.5	3.0 - 5.0	65 - 78	≤ 90.5
S9.5D	> 30	76 - 22	8	100	4.5	15.5	3.0 - 5.0	65 - 78	≤ 90.0
I19.0C	ALL	64 - 22	7	65	-	13.5	3.0 - 5.0	65 - 78	≤ 90.5
B25.0C	ALL	64 - 22	7	65	-	12.5	3.0 - 5.0	65 - 78	≤ 90.5
	Design Parameter				Design (Criteria			
All Mix	Dust to Binder Ratio		atio (P _{0.075} / P _{be})				0.6 -	1.4 ^C	
Types	Tensi	Tensile Strength Ratio (TSR) D				85% N	∕Iin. ^E		

- **A.** Based on 20 year design traffic.
- **B.** Volumetric Properties based on specimens compacted to N_{des} as modified by the Department.
- C. Dust to Binder Ratio $(P_{0.075} / P_{be})$ for Type S4.75A is 1.0 2.0.
- **D.** NCDOT-T-283 (No Freeze-Thaw cycle required).
- E. TSR for Type S4.75A & B25.0C mixes is 80% minimum.

Page 6-19, Table 610-5, BINDER GRADE REQUIREMENTS (BASED ON RBR%), replace with the following:

TABLE 610-5
BINDER GRADE REQUIREMENTS (BASED ON RBR%)

Mix Type	%RBR ≤ 20%	$21\% \le \% RBR \le 30\%$	$\%$ RBR $\geq 30\%$
S4.75A, S9.5B,	PG 64-22	PG 64-22 ^A	PG-58-28
S9.5C, I19.0C, B25.0C	PG 04-22	PG 04-22	PG-36-26
S9.5D, OGFC	PG 76-22 ^B	n/a	n/a

- **A.** If the mix contains any amount of RAS, the virgin binder shall be PG 58-28.
- **B.** Maximum Recycled Binder Replacement (%RBR) is 18% for mixes using PG 76-22 binder.

Page 6-20, Table 610-6, PLACEMENT TEMPERATURES FOR ASPHALT, replace with the following:

TABLE 610-6 PLACEMENT TEMPERATURES FOR ASPHALT			
Asphalt Concrete Mix Type	Asphalt Concrete Mix Type Minimum Surface and Air Temperature		
B25.0C	35°F		
I19.0C	35°F		
S4.75A, S9.5B, S9.5C	40°F ^A		
S9.5D	50°F		

A. For the final layer of surface mixes containing recycled asphalt shingles (RAS), the minimum surface and air temperature shall be 50°F.

Page 6-21, Article 610-8, SPREADING AND FINISHING, lines 34-35, delete the second sentence and replace with the following:

Use an MTV for all surface mix regardless of binder grade on Interstate, US Routes, and NC Routes (primary routes) that have 4 or more lanes and median divided.

Page 6-21, Article 610-8, SPREADING AND FINISHING, lines 36-38, delete the fourth sentence and replace with the following:

Use MTV for all ramps, loops, Y-line that have 4 or more lanes and are median divided, full width acceleration lanes, full width deceleration lanes, and full width turn lanes that are greater than 1000 feet in length.

Page 6-23, Table 610-7, DENSITY REQUIREMENTS, replace with the following:

TABLE 610-7 DENSITY REQUIREMENTS	
Mix Type	Minimum % G _{mm} (Maximum Specific Gravity)
S4.75A	85.0 ^A
S9.5B	90.0
S9.5C, S9.5D, I19.0C, B25.0C	92.0

A. Compaction to the above specified density will be required when the S4.75A mix is applied at a rate of 100 lbs/sy or higher.

Page 6-24, Article 610-13, FINAL SURFACE TESTING, lines 35-36, delete the second sentence and replace with the following:

Final surface testing is not required on ramps, loops and turn lanes.

Page 6-26, Subarticle 610-13(A)(1), Acceptance for New Construction, lines 29-30, delete the second sentence and replace with the following:

Areas excluded from testing by the profiler may be tested using a 10-foot straightedge in accordance with Article 610-12.

Page 6-27, Subarticle 610-13(B), Option 2- North Carolina Hearne Straightedge, lines 41-46, delete the eighth and ninth sentence of this paragraph and replace with the following:

Take profiles over the entire length of the final surface travel lane pavement exclusive of structures, approach slabs, paved shoulders, tapers, or other irregular shaped areas of pavement, unless otherwise approved by the Engineer. Test in accordance with this provision all mainline travel lanes, full width acceleration or deceleration lanes and collector lanes.

Page 6-28, Subarticle 610-13(B), Option 2- North Carolina Hearne Straightedge, lines 1-2, delete these two lines.

Page 6-32, Article 610-16 MEASUREMENT AND PAYMENT, replace with the following:

Pay Item	Pay Unit
Asphalt Concrete Base Course, Type B25.0C	Ton
Asphalt Concrete Intermediate Course, Type I19.0C	Ton
Asphalt Concrete Surface Course, Type S4.75A	Ton
Asphalt Concrete Surface Course, Type S9.5B	Ton
Asphalt Concrete Surface Course, Type S9.5C	Ton
Asphalt Concrete Surface Course, Type S9.5D	Ton

Page 10-30, Table 1012-1, AGGREGATE CONSENSUS PROPERTIES, replace with the following:

TABLE 1012-1 AGGREGATE CONSENSUS PROPERTIES^A

Mix Type	Coarse Aggregate Angularity ^B	Fine Aggregate Angularity % Minimum	Sand Equivalent % Minimum	Flat and Elongated 5:1 Ratio % Maximum
Test Method	ASTM D5821	AASHTO T 304	AASHTO T 176	ASTM D4791
S4.75A; S9.5B	75 / -	40	40	-
S9.5C; I19.0C; B25.0C	95 / 90	45	45	10
S9.5D	100 / 100	45	50	10
OGFC	100 / 100	45	45	10
UBWC	100 / 85	45	45	10

A. Requirements apply to the design aggregate blend.

7" CONCRETE TRUCK APRON:

Description

Construct 7" Concrete Truck Apron in accordance with Section 848 of the 2018 Standard Specifications as modified by the typical section in the plans and this provision and as directed by the Engineer.

Materials

Concrete shall be Class AA Concrete meeting the requirements of Section 1000 of the *Standard Specifications*.

Wire mesh reinforcement shall be 4x4-W3.5 x W3.5 wire mesh meeting the requirements of Section 1070 of the 2018 Standard Specifications.

Joints, aligned radially, shall be placed in the concrete. The spacing of these joints shall be 15' or less.

Measurement and Payment

7" Concrete Truck Apron will be measured and paid for in square yards of 7" Concrete Truck Apron that have been completed and accepted. Such price and payment will be full compensation for all work of constructing the truck apron, including but not limited to excavating and backfilling, furnishing and placing concrete, constructing joints and sealing the concrete.

Pay Item Pay Unit

B. 95 / 90 denotes that 95% of the coarse aggregate has one fractured face and 90% has 2 or more fractured faces.

7" Concrete Truck Apron

Square Yard

AUTOMATED MACHINE GUIDANCE

(1-2-11) 801 SP8 R01

General

This Special Provision contains requirements to be followed if the Contractor elects to use Global Positioning System (GPS) machine control grading and shall be used in conjunction with Section 801 of the *Standard Specifications*. The use of this technology is referenced as Automated Machine Guidance (AMG).

All equipment using AMG shall be able to generate end results that meet the *Standard Specifications*. Perform test sections for each type of work to be completed with AMG to demonstrate that the system has the capability to achieve acceptable results. If acceptable results cannot be achieved, conform to the requirements for conventional stakeout.

The Contractor shall be responsible for all errors resulting from the use of AMG and shall correct deficiencies to the satisfaction of the Engineer at no cost to the Department.

Submittals

If the Contractor elects to use AMG, a Digital Terrain Model (DTM) of the design surface and all intermediate surfaces shall be developed and submitted to the Engineer for review.

At least 90 days prior to beginning grading operations, the Contractor shall submit to the Engineer an AMG work plan to include, but not limited to, proposed equipment, control software manufacturer and version, types of work to be completed using AMG, project site calibration report, repetitive calibration methods for construction equipment and rover units to be used for the duration of the project, and local GPS base station to be used for broadcasting differential correction data to rover units (this may include the NC Network RTK). All surveys must be tied to existing project control as established by NCDOT.

Inspection

The Engineer will perform quality assurance checks of all work associated with AMG. If it is determined that work is not being performed in a manner that will assure accurate results, the Engineer may require corrective action at no cost to the Department.

The Contractor shall provide the Engineer with one GPS rover unit for use during the duration of the contract. The rover will be loaded with the same model that is used with the AMG and have the same capability as rover units used by the Contractor. The rover will be kept in the possession of the Engineer and will be returned to the Contractor upon completion of the contract. Any maintenance or repairs required for the rover will be the responsibility of the Contractor. Formal training of at least 8 hours shall be provided to the Engineer by the Contractor on the use of the proposed AMG system.

Subgrade and Base Controls

If the Contractor elects to use AMG for fine grading and placement of base or other roadway materials, the GPS shall be supplemented with a laser or robotic total station. Include details of the proposed system in the AMG work plan. In addition, the following requirements apply for the use of AMG for subgrade and base construction.

Provide control points at intervals along the project not to exceed 1,000 feet. The horizontal position of these points shall be determined by static GPS sessions or by traverse connection from the original base line control points. The elevation of these control points shall be established using differential leveling from project benchmarks, forming closed loops where practical. A copy of all new control point information shall be provided to the Engineer prior to construction activities.

Provide control points and conventional survey grade stakes at 500 foot intervals and at critical points such as, but not limited to, PCs, PTs, superelevation transition points, and other critical points as requested by the Engineer.

Provide hubs at the top of the finished subgrade at all hinge points on the cross section at 500 foot intervals. These hubs shall be established using conventional survey methods for use by the Engineer to check the accuracy of construction.

Measurement and Payment

No direct payment will be made for work required to utilize this provision. All work will be considered incidental to various grading operations.

SUPPLEMENTAL SURVEYING:

(4-20-21) 801 SP8 R03

Revise the 2018 Standard Specifications as follows:

Page 8-7, Article 801-3 MEASUREMENT AND PAYMENT, lines 10-11, replace with the following:

Supplemental Surveying Office Calculations will be paid at the stated price of \$85.00 per hour. Supplemental Field Surveying will be paid at the stated price of \$145.00 per hour. The

2'-0'' MODIFIED VALLEY GUTTER:

(04-27-20)

Description

The work covered by this provision consists of the construction of Modified Valley Gutter in accordance with the requirements shown on the plans, Detail 846.01 of the 2018 Standard Drawings and the applicable requirements of Sections 846 of the 2018 Standard Specifications.

Materials

In Accordance with Section 846-2.

Construction

Modified Valley Gutter shall be constructed in accordance with Section 846 of the 2018 Standard Specifications.

Measurement and Payment

2'-0" Modified Valley Gutter will be measured and paid in linear feet, accepted in place. Measurement will be made along the surface of the top of the curb.

Work includes providing all materials, placing all concrete, excavating and backfilling, forming, finishing, constructing and sealing joints and all incidentals necessary to complete the work.

Payment will be made under:

Pay ItemPay Unit2'-0" Modified Valley GutterLinear Foot

VERTICAL CONCRETE BARRIER TRANSITION:

Description

Construct the Vertical Concrete Barrier Transitions as indicated in the plans along the eastbound lanes of -Y3- (Over Mountain Victory Trail Greenway) and as directed by the Engineer. The concrete barrier shall transition from the single slope concrete barrier along the Over Mountain Victory Trail Greenway to the standard vertical concrete barrier at the bridge approach slabs of each end for the proposed bridge.

Measurement and Payment

The Vertical Concrete Barrier Transition will be measured and paid for per each section that is completed and accepted by the Engineer. Such price and payment will be full compensation for all labor, materials including, but not limited to, concrete barrier, bar reinforcement, and all other incidentals necessary to construct the Vertical Concrete Barrier Transition.

Payment will be made under:

Pay ItemPay UnitVertical Concrete Barrier TransitionEach

GUARDRAIL END UNITS, TYPE - TL-2:

(10-21-08) (Rev. 7-1-17) 862 SP8 R64

Description

Furnish and install guardrail end units in accordance with the details in the plans, the applicable requirements of Section 862 of the 2018 Standard Specifications, and at locations shown in the plans.

Materials

Furnish guardrail end units listed on the NCDOT <u>Approved Products List</u> at https://apps.dot.state.nc.us/vendor/approvedproducts/ or approved equal.

Prior to installation the Contractor shall submit to the Engineer:

- (A) FHWA acceptance letter for each guardrail end unit certifying it meets the requirements of the AASHTO Manual for Assessing Safety Hardware, Test Level 2 in accordance with Article 106-2 of the 2018 Standard Specifications.
- (B) Certified working drawings and assembling instructions from the manufacturer for each guardrail end unit in accordance with Article 105-2 of the 2018 Standard Specifications.

No modifications shall be made to the guardrail end unit without the express written permission from the manufacturer. Perform installation in accordance with the details in the plans, and details and assembling instructions furnished by the manufacturer.

Construction Methods

Guardrail end delineation is required on all approach and trailing end sections for both temporary and permanent installations. Guardrail end delineation consists of yellow reflective sheeting applied to the entire end section of the guardrail in accordance with Article 1088-3 of the 2018 Standard Specifications and is incidental to the cost of the guardrail end unit.

Measurement and Payment

Measurement and payment will be made in accordance with Article 862-6 of the 2018 Standard Specifications.

Payment will be made under:

Pay ItemPay UnitGuardrail End Units, Type TL-2Each

GUARDRAIL END UNITS, TYPE - TL-3:

(4-20-04) (Rev. 7-1-17) 862 SP8 R65

Description

Furnish and install guardrail end units in accordance with the details in the plans, the applicable requirements of Section 862 of the 2018 Standard Specifications, and at locations shown in the plans.

Materials

Furnish guardrail end units listed on the NCDOT <u>Approved Products List</u> at https://apps.dot.state.nc.us/vendor/approvedproducts/ or approved equal.

Prior to installation the Contractor shall submit to the Engineer:

- (A) FHWA acceptance letter for each guardrail end unit certifying it meets the requirements of the AASHTO Manual for Assessing Safety Hardware, Test Level 3, in accordance with Article 106-2 of the 2018 Standard Specifications.
- (B) Certified working drawings and assembling instructions from the manufacturer for each guardrail end unit in accordance with Article 105-2 of the 2018 Standard Specifications.

No modifications shall be made to the guardrail end unit without the express written permission from the manufacturer. Perform installation in accordance with the details in the plans, and details and assembling instructions furnished by the manufacturer.

Construction Methods

Guardrail end delineation is required on all approach and trailing end sections for both temporary and permanent installations. Guardrail end delineation consists of yellow reflective sheeting applied to the entire end section of the guardrail in accordance with Article 1088-3 of the 2018 Standard Specifications and is incidental to the cost of the guardrail end unit.

Measurement and Payment

Measurement and payment will be made in accordance with Article 862-6 of the 2018 Standard Specifications.

Payment will be made under:

Pay ItemPay UnitGuardrail End Units, Type TL-3Each

GUARDRAIL ANCHOR UNITS AND TEMPORARY GUARDRAIL ANCHOR UNITS: (1-16-2018) 862 SP8 R7

Guardrail anchor units will be in accordance with the details in the plans and the applicable requirements of Section 862 of the 2018 Standard Specifications.

Revise the 2018 Standard Specifications as follows:

Page 8-42, Article 862-6 MEASUREMENT AND PAYMENT, add the following:

Guardrail Anchor Units, Type ___ and Temporary Guardrail Anchor Units Type ___ will be measured and paid as units of each completed and accepted. No separate measurement will be made of any rail, terminal sections, posts, offset blocks, concrete, hardware or any other components of the completed unit that are within the pay limits shown in the plans for the unit as all such components will be considered to be part of the unit.

Payment will be made under:

Pay Item	Pay Unit
Guardrail Anchor Units, Type	Each
Temporary Guardrail Anchor Units, Type	Each

IMPACT ATTENUATOR UNITS, TYPE TL-3:

(4-20-04) (Rev. 12-18-18) SP8 R75

Description

Furnish and install impact attenuator units and any components necessary to connect the impact attenuator units in accordance with the manufacturer's requirement, the details in the plans and at locations shown in the plans.

Materials

Furnish impact attenuator units listed on the <u>Approved Products List</u> at https://apps.dot.state.nc.us/vendor/approvedproducts/ or approved equal. Prior to installation the Contractor shall submit to the Engineer:

- (A) FHWA acceptance letter for each impact attenuator unit certifying it meets the requirements of the Manual for Assessing Safety Hardware (MASH-16), Test Level 3, in accordance with Article 106-2 of the 2018 Standard Specifications.
- (B) Certified working drawings and assembling instructions from the manufacturer for each impact attenuator unit in accordance with Article 105-2 of the 2018 Standard Specifications.

No modifications shall be made to the impact attenuator unit without the express written permission from the manufacturer. Perform installation in accordance with the details in the plans and details and assembling instructions furnished by the manufacturer.

Construction Methods

If the median width is 40 feet or less, the Contractor shall supply NON-GATING Impact Attenuator Units.

If the median width is greater than 40 feet, the Contractor may use GATING or NON-GATING Impact Attenuator Units.

Measurement and Payment

Impact Attenuator Unit, Type TL-3 will be measured and paid at the contract unit price per each. Such prices and payment will be full compensation for all work covered by this provision including, but not limited to, furnishing, installing and all incidentals necessary to complete the work.

Payment will be made under:

Pay ItemPay UnitImpact Attenuator Units, Type TL-3Each

BIKE AND PEDESTRIAN SAFETY RAIL:

Description

Furnish and install Bike and Pedestrian Safety Rail at the locations shown in the plans, in accordance with the detail in the plans and as directed by the Engineer.

Measurement and Payment

Bike and Pedestrian Safety Rail will be measured and paid for as the actual number of linear feet of safety rail measured along the top of the rail to the nearest 0.1 of a foot. Such price and payment shall be full compensation for fabricating, furnishing, installing, welding, painting and all incidentals necessary to satisfactorily install the safety rail.

Payment will be made under:

Pay ItemPay UnitBike and Pedestrian Safety RailLinear Foot

PERMANENT BOLLARDS:

Furnish and install bollards in accordance with the detail in the plans, at locations shown in the plans and as directed by the Engineer.

Install bollards plum and true to line in as shown in the detail and in accordance with all applicable portions of Section 825 and 1000 of the Standard Specifications.

Permanent Bollards will be measured and paid for as the actual number of permanent bollards installed and accepted. Such payment will be full compensation for all materials, labor, equipment and incidentals necessary to complete the work.

Payment will be made under:

Pay ItemPay UnitPermanent BollardsEach

REMOVABLE BOLLARDS:

Furnish and install removable bollards in accordance with the detail in the plans, at locations shown in the plans and as directed by the Engineer.

Install bollards plum and true to line in as shown in the detail and in accordance with all applicable portions of Section 825 and 1000 of the *Standard Specifications*.

Removable Bollards will be measured and paid for as the actual number of removable bollards installed and accepted. Such payment will be full compensation for all materials, labor, equipment and incidentals necessary to complete the work.

Payment will be made under:

Pay ItemPay UnitRemovable BollardsEach

FOUNDATIONS AND ANCHOR ROD ASSEMBLIES FOR METAL POLES:

(1-17-12) (Rev. 1-16-18) 9, 14, 17 SP9 R05

Description

Foundations for metal poles include foundations for signals, cameras, overhead and dynamic message signs (DMS) and high mount and light standards supported by metal poles or upright trusses. Foundations consist of footings with pedestals and drilled piers with or without grade beams or wings. Anchor rod assemblies consist of anchor rods (also called anchor bolts) with nuts and washers on the exposed ends of rods and nuts and a plate or washers on the other ends of rods embedded in the foundation.

Construct concrete foundations with the required resistances and dimensions and install anchor rod assemblies in accordance with the contract and accepted submittals. Construct drilled piers consisting of cast-in-place reinforced concrete cylindrical sections in excavated holes. Provide temporary casings or polymer slurry as needed to stabilize drilled pier excavations. Use a prequalified Drilled Pier Contractor to construct drilled piers for metal poles. Define "excavation" and "hole" as a drilled pier excavation and "pier" as a drilled pier.

This provision does not apply to foundations for signal pedestals; see Section 1743 of the 2018 Standard Specifications and 2018 Roadway Standard Drawing No. 1743.01.

Materials

Refer to the 2018 Standard Specifications.

Item	Section
Conduit	1091-3
Grout, Type 2	1003
Polymer Slurry	411-2(B)(2)
Portland Cement Concrete	1000
Reinforcing Steel	1070
Rollers and Chairs	411-2(C)
Temporary Casings	411-2(A)

Provide Type 3 material certifications in accordance with Article 106-3 of the 2018 Standard Specifications for conduit, rollers, chairs and anchor rod assemblies. Store steel materials on blocking at least 12" above the ground and protect it at all times from damage; and when placing in the work make sure it is free from dirt, dust, loose mill scale, loose rust, paint, oil or other foreign

materials. Load, transport, unload and store foundation and anchor rod assembly materials so materials are kept clean and free of damage. Bent, damaged or defective materials will be rejected.

Use conduit type in accordance with the contract. Use Class A concrete for footings and pedestals, Class Drilled Pier concrete for drilled piers and Class AA concrete for grade beams and wings including portions of drilled piers above bottom of wings elevations. Corrugated temporary casings may be accepted at the discretion of the Engineer. A list of approved polymer slurry products is available from:

connect.ncdot.gov/resources/Geological/Pages/Products.aspx

Provide anchor rod assemblies in accordance with the contract consisting of the following:

- (A) Straight anchor rods,
- (B) Heavy hex top and leveling nuts and flat washers on exposed ends of rods, and
- (C) Nuts and either flat plates or washers on the other ends of anchor rods embedded in foundations.

Do not use lock washers. Use steel anchor rods, nuts and washers that meet ASTM F1554 for Grade 55 rods and Grade A nuts. Use steel plates and washers embedded in concrete with a thickness of at least 1/4". Galvanize anchor rods and exposed nuts and washers in accordance with Article 1076-4 of the 2018 Standard Specifications. It is not necessary to galvanize nuts, plates and washers embedded in concrete.

Construction Methods

Install the required size and number of conduits in foundations in accordance with the plans and accepted submittals. Construct top of piers, footings, pedestals, grade beams and wings flat, level and within 1" of elevations shown in the plans or approved by the Engineer. Provide an Ordinary Surface finish in accordance with Subarticle 825-6(B) of the 2018 Standard Specifications for portions of foundations exposed above finished grade. Do not remove anchor bolt templates or pedestal or grade beam forms or erect metal poles or upright trusses onto foundations until concrete attains a compressive strength of at least 3,000 psi.

(A) Drilled Piers

Before starting drilled pier construction, hold a predrill meeting to discuss the installation, monitoring and inspection of the drilled piers. Schedule this meeting after the Drilled Pier Contractor has mobilized to the site. The Resident or Division Traffic Engineer, Contractor and Drilled Pier Contractor Superintendent will attend this predrill meeting.

Do not excavate holes, install piles or allow equipment wheel loads or vibrations within 20 ft of completed piers until 16 hours after Drilled Pier concrete reaches initial set.

Check for correct drilled pier alignment and location before beginning drilling. Check plumbness of holes frequently during drilling.

Construct drilled piers with the minimum required diameters shown in the plans. Install piers with tip elevations no higher than shown in the plans or approved by the Engineer.

Excavate holes with equipment of the sizes required to construct drilled piers. Depending on the subsurface conditions encountered, drilling through rock and boulders may be required. Do not use blasting for drilled pier excavations.

Contain and dispose of drilling spoils and waste concrete as directed and in accordance with Section 802 of the 2018 Standard Specifications. Drilling spoils consist of all materials and fluids removed from excavations.

If unstable, caving or sloughing materials are anticipated or encountered, stabilize holes with temporary casings and/or polymer slurry. Do not use telescoping temporary casings. If it becomes necessary to replace a temporary casing during drilling, backfill the excavation, insert a larger casing around the casing to be replaced or stabilize the excavation with polymer slurry before removing the temporary casing.

If temporary casings become stuck or the Contractor proposes leaving casings in place, temporary casings should be installed against undisturbed material. Unless otherwise approved, do not leave temporary casings in place for mast arm poles and cantilever signs. The Engineer will determine if casings may remain in place. If the Contractor proposes leaving temporary casings in place, do not begin drilling until a casing installation method is approved.

Use polymer slurry and additives to stabilize holes in accordance with the slurry manufacturer's recommendations. Provide mixing water and equipment suitable for polymer slurry. Maintain the required slurry properties at all times except for sand content.

Define a "sample set" as slurry samples collected from mid-height and within 2 ft of the bottom of holes. Take sample sets from excavations to test polymer slurry immediately after filling holes with slurry, at least every 4 hours thereafter and immediately before placing concrete. Do not place Drilled Pier concrete until both slurry samples from an excavation meet the required polymer slurry properties. If any slurry test results do not meet the requirements, the Engineer may suspend drilling until both samples from a sample set meet the required polymer slurry properties.

Remove soft and loose material from bottom of holes using augers to the satisfaction of the Engineer. Assemble rebar cages and place cages and Drilled Pier concrete in accordance with Subarticle 411-4(E) of the 2018 Standard Specifications except for the following:

- (1) Inspections for tip resistance and bottom cleanliness are not required,
- (2) Temporary casings may remain in place if approved, and
- (3) Concrete placement may be paused near the top of pier elevations for anchor rod assembly installation and conduit placement or
- (4) If applicable, concrete placement may be stopped at bottom of grade beam or wings elevations for grade beam or wing construction.

If wet placement of concrete is anticipated or encountered, do not place Drilled Pier concrete until a concrete placement procedure is approved. If applicable, temporary casings and fluids may be removed when concrete placement is paused or stopped in accordance with the exceptions above provided holes are stable. Remove contaminated concrete from exposed Drilled Pier concrete after removing casings and fluids. If holes are unstable, do not remove temporary casings until a procedure for placing anchor rod assemblies and conduit or constructing grade beams or wings is approved.

Use collars to extend drilled piers above finished grade. Remove collars after Drilled Pier concrete sets and round top edges of piers.

If drilled piers are questionable, pile integrity testing (PIT) and further investigation may be required in accordance with Article 411-5 of the 2018 Standard Specifications. A drilled pier will be considered defective in accordance with Subarticle 411-5(D) of the 2018 Standard Specifications and drilled pier acceptance is based in part on the criteria in Article 411-6 of the 2018 Standard Specifications except for the top of pier tolerances in Subarticle 411-6(C) of the 2018 Standard Specifications.

If a drilled pier is under further investigation, do not grout core holes, backfill around the pier or perform any work on the drilled pier until the Engineer accepts the pier. If the drilled pier is accepted, dewater and grout core holes and backfill around the pier with approved material to finished grade. If the Engineer determines a pier is unacceptable, remediation is required in accordance with Article 411-6 of the 2018 Standard Specifications. No extension of completion date or time will be allowed for remediation of unacceptable drilled piers or post repair testing.

Permanently embed a plate in or mark top of piers with the pier diameter and depth, size and number of vertical reinforcing bars and the minimum compressive strength of the concrete mix at 28 days.

(B) Footings, Pedestals, Grade Beams and Wings

Excavate as necessary for footings, grade beams and wings in accordance with the plans, accepted submittals and Section 410 of the 2018 Standard Specifications. If unstable, caving or sloughing materials are anticipated or encountered, shore foundation excavations as needed with an approved method. Notify the Engineer when foundation excavation is complete. Do not place concrete or reinforcing steel until excavation dimensions and foundation material are approved.

Construct cast-in-place reinforced concrete footings, pedestals, grade beams and wings with the dimensions shown in the plans and in accordance with Section 825 of the 2018 Standard Specifications. Use forms to construct portions of pedestals and grade beams protruding above finished grade. Provide a chamfer with a 3/4" horizontal width for pedestal and grade beam edges exposed above finished grade. Place concrete against undisturbed soil or backfill and fill in accordance with Article 410-8 of the 2018 Standard Specifications. Proper compaction around footings and wings is critical for foundations to resist uplift and torsion forces.

(C) Anchor Rod Assemblies

Size anchor rods for design and the required projection above top of foundations. Determine required anchor rod projections from nut, washer and base plate thicknesses, the protrusion of 3 to 5 anchor rod threads above top nuts after tightening and the distance of one nut thickness between top of foundations and bottom of leveling nuts.

Protect anchor rod threads from damage during storage and installation of anchor rod assemblies. Before placing anchor rods in foundations, turn nuts onto and off rods past leveling nut locations. Turn nuts with the effort of one workman using an ordinary wrench without a cheater bar. Report any thread damage to the Engineer that requires extra effort to turn nuts.

Arrange anchor rods symmetrically about center of base plate locations as shown in the plans. Set anchor rod elevations based on required projections above top of foundations. Securely brace and hold rods in the correct position, orientation and alignment with a steel template. Do not weld to reinforcing steel, temporary casings or anchor rods.

Install top and leveling (bottom) nuts, washers and the base plate for each anchor rod assembly in accordance with the following procedure:

- (1) Turn leveling nuts onto anchor rods to a distance of one nut thickness between the top of foundation and bottom of leveling nuts. Place washers over anchor rods on top of leveling nuts.
- (2) Determine if nuts are level using a flat rigid template on top of washers. If necessary, lower leveling nuts to level the template in all directions or if applicable, lower nuts to tilt the template so the metal pole or upright truss will lean as shown in the plans. If leveling nuts and washers are not in full contact with the template, replace washers with galvanized beveled washers.
- (3) Verify the distance between the foundation and leveling nuts is no more than one nut thickness.
- (4) Place base plate with metal pole or upright truss over anchor rods on top of washers. High mount luminaires may be attached before erecting metal poles but do not attach cables, mast arms or trusses to metal poles or upright trusses at this time.
- (5) Place washers over anchor rods on top of base plate. Lubricate top nut bearing surfaces and exposed anchor rod threads above washers with beeswax, paraffin or other approved lubricant.
- (6) Turn top nuts onto anchor rods. If nuts are not in full contact with washers or washers are not in full contact with the base plate, replace washers with galvanized beveled washers.
- (7) Tighten top nuts to snug-tight with the full effort of one workman using a 12" wrench. Do not tighten any nut all at once. Turn top nuts in increments. Follow a star pattern cycling through each nut at least twice.
- (8) Repeat (7) for leveling nuts.
- (9) Replace washers above and below the base plate with galvanized beveled washers if the slope of any base plate face exceeds 1:20 (5%), any washer is not in firm contact with the base plate or any nut is not in firm contact with a washer. If any washers are replaced, repeat (7) and (8).

(10) With top and leveling nuts snug-tight, mark each top nut on a corner at the intersection of 2 flats and a corresponding reference mark on the base plate. Mark top nuts and base plate with ink or paint that is not water-soluble. Use the turn-of-nut method for pretensioning. Do not pretension any nut all at once. Turn top nuts in increments for a total turn that meets the following nut rotation requirements:

NUT ROTATION REQUIREMENTS	
(Turn-of-Nut Pretensioning Method)	
Anchor Rod Diameter, inch	Requirement
≤ 1 1/2	1/3 turn (2 flats)
> 1 1/2	1/6 turn (1 flat)

Follow a star pattern cycling through each top nut at least twice.

- (11) Ensure nuts, washers and base plate are in firm contact with each other for each anchor rod. Cables, mast arms and trusses may now be attached to metal poles and upright trusses.
- (12) Between 4 and 14 days after pretensioning top nuts, use a torque wrench calibrated within the last 12 months to check nuts in the presence of the Engineer. Completely erect mast arm poles and cantilever signs and attach any hardware before checking top nuts for these structures. Check that top nuts meet the following torque requirements:

TORQUE REQUIREMENTS		
Anchor Rod Diameter, inch	Requirement, ft-lb	
7/8	180	
1	270	
1 1/8	380	
1 1/4	420	
≥ 1 1/2	600	

If necessary, retighten top nuts in the presence of the Engineer with a calibrated torque wrench to within \pm 10 ft-lb of the required torque. Do not overtighten top nuts.

(13) Do not grout under base plate.

Measurement and Payment

Foundations and anchor rod assemblies for metal poles and upright trusses will be measured and paid for elsewhere in the contract.

No payment will be made for temporary casings that remain in drilled pier excavations. No payment will be made for PIT. No payment will be made for further investigation of defective piers. Further investigation of piers that are not defective will be paid as extra work in accordance with Article 104-7 of the 2018 Standard Specifications. No payment will be made for remediation of unacceptable drilled piers or post repair testing.

OVERHEAD AND DYNAMIC MESSAGE SIGN FOUNDATIONS:

(1-16-18)

SP9 R07

Description

Sign foundations include foundations for overhead and dynamic message signs (DMS) supported

by metal poles or upright trusses. Sign foundations consist of footings with pedestals or drilled piers with or without grade beams or wings, conduit and anchor rod assemblies. Construct sign foundations in accordance with the contract and accepted submittals. Define "cantilever sign" as an overhead cantilever sign support in accordance with Figure 1-1 of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

Materials

Use sign foundation materials that meet the *Foundations and Anchor Rod Assemblies for Metal Poles* provision.

Subsurface Conditions

Assume the following soil parameters and groundwater elevation for sign foundations unless these subsurface conditions are not applicable to sign locations:

- (A) Unit weight $(\gamma) = 120 \text{ pcf}$,
- (B) Friction angle (ϕ) = 30°,
- (C) Cohesion (c) = 0 psf and
- (D) Groundwater 7 feet below finished grade.

A subsurface investigation is required if the Engineer determines these assumed subsurface conditions do not apply to a sign location and the sign cannot be moved. Subsurface conditions requiring a subsurface investigation include but are not limited to weathered or hard rock, boulders, very soft or loose soil, muck or shallow groundwater. No extension of completion date or time will be allowed for subsurface investigations.

Subsurface Investigations

Use a prequalified geotechnical consultant to perform one standard penetration test (SPT) boring in accordance with ASTM D1586 at each sign location requiring a subsurface investigation. Rough grade sign locations to within 2 feet of finished grade before beginning drilling. Drill borings to 2 drilled pier diameters below anticipated pier tip elevations or refusal, whichever is higher.

Use the computer software gINT version V8i or later manufactured by Bentley Systems, Inc. with the current NCDOT gINT library and data template to produce SPT boring logs. Provide boring logs sealed by a geologist or engineer licensed in the state of North Carolina.

Sign Foundation Designs

Design sign foundations for the wind zone and clearances shown in the plans and the slope of finished grade at each sign location. Use the assumed soil parameters and groundwater elevation above for sign foundation designs unless a subsurface investigation is required. For sign locations requiring a subsurface investigation, design sign foundations for the subsurface conditions at each sign location. Design footings, pedestals, drilled piers, grade beams and wings in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. In some instances, conflicts with drainage structures may dictate sign foundation types.

Design footings in accordance with Section 4.4 of the AASHTO Standard Specifications for Highway Bridges. Do not use an allowable bearing pressure of more than 3,000 psf for footings. Design drilled piers for side resistance only in accordance with Section 4.6 of the AASHTO Standard Specifications for Highway Bridges except reduce ultimate side resistance by 25% for uplift. Use the computer software LPILE version 2016 or later manufactured by Ensoft, Inc. to analyze drilled piers. Provide drilled pier designs with a horizontal deflection of less than 1" at top of piers. For cantilever signs with single drilled pier foundations supporting metal poles, use wings to resist torsion forces. Provide drilled pier designs with a factor of safety of at least 2.0 for torsion.

For drilled pier sign foundations supporting upright trusses, use dual drilled piers connected with a grade beam having a moment of inertia approximately equal to that of either pier. The Broms' method is acceptable to analyze drilled piers with grade beams instead of LPILE. Use a safety factor of at least 3.5 for the Broms' design method in accordance with C13.6.1.1 of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

Submit boring logs, if any, working drawings and design calculations for acceptance in accordance with Article 105-2 of the 2018 Standard Specifications. Submit working drawings showing plan views, required foundation dimensions and elevations and typical sections with reinforcement, conduit and anchor rod assembly details. Include all boring logs, design calculations and LPILE output for sign foundation design submittals. Have sign foundations designed, detailed and sealed by an engineer licensed in the state of North Carolina.

Construction Methods

Construct footings, pedestals, drilled piers, grade beams and wings and install anchor rod assemblies for sign foundations in accordance with the *Foundations and Anchor Rod Assemblies* for Metal Poles provision.

Measurement and Payment

Overhead Footings will be measured and paid in cubic yards. Sign foundations will be measured as the cubic yards of foundation concrete for footings, pedestals, drilled piers, grade beams and wings shown in the accepted submittals. The contract unit price for Overhead Footings will be full compensation for providing labor, tools, equipment and foundation materials, stabilizing or shoring excavations, supplying and placing concrete, reinforcing steel, conduit, anchor rod assemblies and any incidentals necessary to construct sign foundations. Subsurface investigations required by the Engineer will be paid as extra work in accordance with Article 104-7 of the 2018 Standard Specifications.

Payment will be made under:

Pay ItemOverhead Footings

Pay Unit
Cubic Yard

PORTLAND CEMENT CONCRETE PRODUCTION AND DELIVERY: (9-15-20) 1000, 1014, 1024

SP10 R01

Revise the 2018 Standard Specifications as follows:

Page 10-6, Table 1000-1, REQUIREMENTS FOR CONCRETE, replace with the following:

TABLE 1000-1 REQUIREMENTS FOR CONCRETE											
Class of	ssive days					Consistency Maximum Slump		Cement Content			
	Min. Compressive Strength at 28 days	Air-Entrained Concrete Rounded Angular Rounded Angular	Vibrated	Non- Vibrated	Vibrated		Non-Vibrated				
	Str	Aggregate	Aggregate	Aggregate	Aggregate	>		Min.	Max.	Min.	Max.
Units	psi					inch	inch	lb/cy	lb/cy	lb/cy	lb/cy
AA	4500	0.381	0.426			3.5 ^A		639	715		
AA Slip Form	4500	0.381	0.426			1.5		639	715		
Drilled Pier	4500			0.450	0.450		5 – 7 dry 7 - 9 wet			640	800
A	3000	0.488	0.532	0.550	0.594	3.5 A	4.0	564		602	
В	2500	0.488	0.567	0.559	0.630	1.5 machine placed 2.5 A hand placed	4.0	508		545	
Sand Light- weight	4500		0.420			4.0 A		715			
Latex Modified	3000 (at 7 days)	0.400	0.400			6.0		658			
Flowable Fill excavatable	150 max. (at 56 days)	as needed	as needed	as needed	as needed		Flowable			40	100
Flowable Fill non- excavatable	125	as needed	as needed	as needed	as needed		Flowable			100	as needed
Pavement	4500 Design, field 650 flexural, design only	0.559	0.559			1.5 slip form 3.0 hand placed		526			

Precast	See Table 1077-1	as needed	as needed	 	6.0	as needed				
Prestressed	per contract	See Table 1078-1	See Table 1078-1	 	8.0		564	as needed		

A. The slump may be increased to 6 inches, provided the increase in slump is achieved by adding a chemical admixture conforming to Section 1024-3. In no case shall the water-cement ratio on the approved design be exceeded. Concrete exhibiting segregation and/or excessive bleeding will be rejected. Utilizing an Admixture to modify slump does not relinquish the contractor's responsibility to ensure the final product quality and overall configuration meets design specifications. Caution should be taken when placing these modified mixes on steep grades to prevent unintended changes to the set slope.

HIGH STRENGTH CONCRETE FOR DRIVEWAYS:

(11-21-00) (Rev. 1-17-12)

848

SP10 R02

Use high early strength concrete for all driveways shown in the plans and as directed by the Engineer. Provide high early strength concrete that meets the requirements of Article 1000-5 of the 2018 Standard Specifications.

Measurement and payment will be in accordance with Section 848 of the 2018 Standard Specifications.

THERMOPLASTIC PAVEMENT MARKING MATERIAL - COLOR TESTING:

9-19

SP10 R05

Revise the 2018 Standard Specifications as follows:

Pages 10-183 and 10-184, Subarticle 1087-7(D)(1)(b) Yellow, lines 9-11, delete and replace with the following:

Obtain Color Values Y,x,y per ASTM E1349 using C/2° illuminant/observer. Results shall be $Y \ge 45\%$, and x,y shall fall within PR#1 chart chromaticity limits.

<u>POLYUREA PAVEMENT MARKING MATERIAL – TYPE 2 TYPICAL CERTIFIED MILL TEST REPORT:</u>

3-19-19 1087 SP10 R06

Amend the 2018 Standard Specifications as follows:

Page 10-184, Subarticle 1087-8 Material Certification, in accordance with Subarticle 106-3 provide a Type 2 Typical Certified Mill Test Report and a Type 3 Manufacturer's Certification for Polyurea pavement marking material.

When tested, the material shall meet the physical and chemical characteristics provided by the manufacturer. NCDOT reserves the right to compare these test results to baseline test results gathered by the NCDOT Materials and Test Unit.

NON-CAST IRON SNOWPLOWABLE PAVEMENT MARKERS:

10-19-21 (Rev. 11-16-21) 1086, 1250, 1253 SP10 R08

Revise the 2018 Standard Specifications as follows:

Pages 10-177 and 10-178, Subarticle 1086-3 SNOWPLOWABLE PAVEMENT MARKERS, delete items (A), (B) and (C)(1) and replace with the following:

(A) General

Use non-cast iron snowplowable pavement markers evaluated by NTPEP. The non-cast iron snowplowable pavement marker shall consist of a housing with one or more glass or plastic face lens type reflective lenses to provide the required color designation. The marker shall be designed or installed in a manner that minimizes damage from snowplow blades. Plastic lens faces shall use an abrasion resistant coating.

(B) Housings

(1) Dimensions

The dimension, slope and minimum area of reflecting surface shall conform to dimensions as shown in the plans. The minimum area of each reflecting surface shall be 1.44 sq.in.

- (2) Materials
 - Use non-cast iron snowplowable pavement markers that are on the NCDOT Approved Products List.
- (3) Surface
 - The surface of the housing shall be free of scale, dirt, rust, oil, grease or any other contaminant which might reduce its bond to the epoxy adhesive.
- (4) Identification

Mark the housing with the manufacturer's name and model number of marker.

(C) Reflectors

(1) General

Laminate the reflector to an elastomeric pad and attach with adhesive to the housing. The thickness of the elastomeric pad shall be 0.04".

Pages 12-14, Subarticle 1250-3(C) Removal of Existing Pavement Markers, lines 19-29, delete and replace with the following:

Remove the existing raised pavement markers or the snowplowable pavement markers including the housings, before overlaying an existing roadway with pavement. Repair the pavement by filling holes as directed by the Engineer.

When traffic patterns are changed in work zones due to construction or reconstruction, remove all raised pavement markers or snowplowable markers including housings that conflict with the new traffic pattern before switching traffic to the new traffic pattern. Lens removal in lieu of total housing removal is not an acceptable practice for snowplowable markers.

Properly dispose of the removed pavement markers. No direct payment will be made for removal or disposal of existing pavement markers or repair of pavement, as such work will be incidental to other items in the contract.

Pages 12-16, Subarticle 1253-1 DESCRIPTION, lines 4-5, delete and replace with the following:

Furnish, install and maintain non-cast iron snowplowable pavement markers in accordance with the contract.

Pages 12-16 and 12-17, Subarticle 1253-3 CONSTRUCTION METHODS, delete items (A), (B) and (C) and replace with the following:

(A) General

Bond marker housings to the pavement with epoxy adhesive. Mechanically mix and dispense epoxy adhesives as required by the manufacturer's specifications. Place the markers immediately after the adhesive has been mixed and dispensed.

If saw cutting, milling, or grooving operations are used, promptly remove all resulting debris from the pavement surface. Install the marker housings within 7 calendar days after saw cutting, milling, or grooving the pavement. Remove and dispose of loose material from the slots by brushing, blow cleaning, or vacuuming. Dry the slots before applying the epoxy adhesive. Install non-cast iron snowplowable pavement markers according to the manufacturer's recommendations.

Protect the non-cast iron snowplowable pavement markers until the epoxy has initially cured and is track free.

(B) Reflector Replacement

In the event that a reflector is damaged, replace the damaged reflector by using adhesives and methods recommended by the manufacturer of the markers and approved by the Engineer. This work is considered incidental if damage occurs during the initial installation of the marker housings and maintenance of initial non-cast iron snowplowable markers specified in this section. This work will be paid for under the pay item for the type of reflector replacement if the damage occurred after the initial installation of the non-cast iron snowplowable pavement marker.

Missing housings shall be replaced. Broken housings shall be removed and replaced. In both cases the slot for the housings shall be properly prepared prior to installing the new housing; patch the existing marker slots as directed by the Engineer and install the new marker approximately one foot before or after the patch. Removal of broken housings and preparation of slots will be considered incidental to the work of replacing housings.

Pages 12-17, Subarticle 1253-4 MAINTENANCE, lines 5, delete and replace with the following:

Maintain all installed non-cast iron snowplowable pavement markers until acceptance.

Pages 12-17, Subarticle 1253-5 MEASUREMENT AND PAYMENT, lines 7-8, delete and replace with the following:

Non-Cast Iron Snowplowable Pavement Markers will be measured and paid as the actual number of non-cast iron snowplowable pavement markers satisfactorily placed and accepted by the Engineer.

Pages 12-17, Subarticle 1253-5 MEASUREMENT AND PAYMENT, lines 11, delete and replace with the following:

Payment will be made under:

Pay ItemPay UnitNon-Cast Iron Snowplowable Pavement MarkerEachReplace Snowplowable Pavement Marker ReflectorEach

MATERIALS FOR PORTLAND CEMENT CONCRETE:

(9-15-20) 1000, 1024 SP10 R24

Revise the 2018 Standard Specifications as follows:

Page 10-52, Article 1024-4, WATER, lines 3-6, delete and replace with the following:

Test water from wells at all locations. Test public water supplies from all out of state locations and in the following counties: Beaufort, Bertie, Brunswick, Camden, Carteret, Chowan, Craven, Currituck, Dare, Gates, Hyde, New Hanover, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Tyrell and Washington unless the Engineer waives the testing requirements.

Page 10-52, Table 1024-2, PHYSICAL PROPERTIES OF WATER, replace with the following:

Property	Requirement	Test Method
Compression Strength, minimum percent of control at 3 and 7 days	90%	ASTM C1602
Time of set, deviation from control	From 1:00 hr. earlier to 1:30 hr. later	ASTM C1602
рН	4.5 to 8.5	ASTM D1293 *
Chloride Ion Content, Max.	250 ppm	ASTM D512 *
Total Solids Content (Residue), Max.	1,000 ppm	SM 2540B *
Resistivity, Min.	0.500 kohm-cm	ASTM D1125 *

^{*}Denotes an alternate method is acceptable. Test method used shall be referenced in the test report.

MATERIAL AND EQUIPMENT STORAGE & PARKING OF PERSONAL VEHICLES:

(12-21-21) 1101 SP11 R03

Revise the Standard Specifications as follows:

Page 11-2, Subarticle 1101-8 MATERIAL AND EQUIPMENT STORAGE, line 35-38, delete and replace with the following:

When work is not in progress, keep all personnel, equipment, machinery, tools, construction debris, materials and supplies away from active travel lanes that meets Table 1101-1.

TABLE 1101-1						
MATERIAL AND EQUIPMENT STORAGE FROM ACTIVE TRAVEL LANES						
Posted Speed Limit (mph)	Distance (ft)					
40 or less	≥ 18					
45-50	≥ 28					
55	≥ 32					
60 or higher	≥ 40					

When vehicles, equipment and materials are protected by concrete barrier or guardrail, they shall be offset at least 5 feet from the barrier or guardrail.

Page 11-2, Subarticle 1101-9 PARKING OF PERSONAL VEHICLES, line 40-41, delete and replace with the following:

Provide staging areas for personal vehicle parking in accordance with section 1101-8 or as directed by the Engineer before use.

WORK ZONE INSTALLER:

(7-20-21) 1101, 1150 SP11 R04

Provide the service of at least one qualified work zone installer during the setup, installation, and removal of temporary traffic control within the highway right of way. The qualified work zone installer shall serve as crew leader and shall be on site and directing the installation and removal of temporary traffic control. If multiple temporary traffic control installations or removals are occurring simultaneously, then each shall have a qualified work zone installer.

The work zone installer shall be qualified by an NCDOT approved training agency in the safe and competent set up of temporary traffic control. For a complete listing of approved training agencies, see the Work Zone Safety Training webpage.

A work zone supervisor, in accordance with Article 1101-13 of the *Standard Specifications*, may fulfill the role of the work zone installer during the setup, installation, and removal of temporary traffic control within the highway right of way provided they are on site and directing the installation and removal of temporary traffic control.

All other individuals participating in the setup, installation, and removal of temporary traffic control within the highway right of way shall be certified as a qualified flagger in accordance with Article 1150-3 of the *Standard Specifications*, even if flagging is not being performed as part of

the traffic control.

Provide the name and contact information of all qualified work zone installers to the Engineer prior to or at the preconstruction conference. Additionally, provide a qualification statement that all other individuals participating in the setup, installation, and removal of temporary traffic control are qualified flaggers that have been properly trained through an NCDOT approved training agency.

WATER FILLED BARRIER:

(11-19-13) 1170 SP11 R25

Revise the 2018 Standard Specifications as follows:

Page 11-17, Article 1170-4 MEASUREMENT AND PAYMENT, lines 32-35, replace the fourth paragraph with the following:

Remove and Reset Water Filled Barrier will be measured and paid as the number of linear feet of barrier moved from one location on the project to another location on the project. Measurement will be made by counting the number of barrier units moved during any one move and multiplying by the length of a unit. Where barrier units are moved more than once, each move will be measured separately. Whenever the Engineer directs the Contractor to move barrier units from an installed location to a stock pile either on or off the project and then back to another installed location, the complete move from the first installed location to the next installed location will be measured as 2 moves.

Page 11-17, Article 1170-4 MEASUREMENT AND PAYMENT, line 38, replace "Reset Water Filled Barrier" with "Remove and Reset Water Filled Barrier".

EXTRUDED THERMOPLASTIC PAVEMENT MARKING THICKNESS:

3-19-19 1205 SP12 R05

Revise the 2018 Standard Specifications as follows:

Page 12-6, Subarticle 1205-4(A)(1) General, lines 5-8, delete the second sentence and replace with the following:

Use application equipment that provides multiple width settings ranging from 4 inches to 12 inches and multiple thickness settings to achieve a minimum pavement marking thickness of 0.090 inch above the surface of the pavement.

Page 12-7, Table 1205-3, THICKNESS REQUIREMENTS FOR THERMOPLASTIC, replace with the following:

TABLE 1205-3 MINIMUM THICKNESS REQUIREMENTS FOR THERMOPLASTIC					
Thickness	Location				
240 mils	In-lane and shoulder-transverse pavement markings (rumble strips). May be placed in 2 passes.				

90 mils	Center lines, skip lines, transverse bands, mini-skip lines, characters, bike lane
	symbols, crosswalk lines, edge lines, gore lines, diagonals, and arrow symbols

PERMANENT SEEDING AND MULCHING:

(7-1-95) 1660 SP16 R02

The Department desires that permanent seeding and mulching be established on this project as soon as practical after slopes or portions of slopes have been graded. As an incentive to obtain an early stand of vegetation on this project, the Contractor's attention is called to the following:

For all permanent seeding and mulching that is satisfactorily completed in accordance with the requirements of Section 1660 in the 2018 Standard Specifications and within the following percentages of elapsed contract times, an additional payment will be made to the Contractor as an incentive additive. The incentive additive will be determined by multiplying the number of acres of seeding and mulching satisfactorily completed times the contract unit bid price per acre for Seeding and Mulching times the appropriate percentage additive.

Percentage of Elapsed Contract Time	Percentage Additive
0% - 30%	30%
30.01% - 50%	15%

Percentage of elapsed contract time is defined as the number of calendar days from the date of availability of the contract to the date the permanent seeding and mulching is acceptably completed divided by the total original contract time.

ORNAMENTAL WOOD FENCE:

General

The work covered by this special provision consists of furnishing and constructing Ornamental Wood Fence at locations along the Rails to Trails corridor as directed by the engineer, including all labor, materials, services and incidentals required to complete the work.

NCDOT is requiring a professional fence Contractor to install the Ornamental Wood Fence. Installer must have an understanding of this style fencing method and shall be an experienced fence builder with a minimum of seven (7) years of experience. References and samples of work from the past three (3) years must be submitted to the engineer during the pre-construction meeting. The Installer shall install fifty (50) linear feet of fencing for approval by the engineer before continuing remaining installation.

All applicable sections of the *Standard Specifications* shall apply. Refer to Sections 866, 1050, 1074, 1076 and 1082.

Materials

All fence materials shall be manufactured in the USA. All materials shall be Micronized Copper Quaternary (MCQ) treated southern pine unless otherwise approved by the Engineer. Posts shall be treated for ground contact and labeled as such. All post, rails vertical and diagonal members

shall be S4S in sizes as specified on the plans. All lumber shall be straight and true for their entire length, free from loose knots, cracks, splits and other imperfections.

All hardware shall be hot dipped galvanized according to applicable requirements of Section 1076. Aggregate base shall be #78 washed granite stone or equivalent approved by the Engineer prior to installation.

Furnish only new materials.

Installation

The fence post locations shall be staked by the contractor and approved by the Engineer prior to beginning installation of the fence. Erect fence to conform to the general contour of the ground but keeping a smooth horizontal line. Grading for the fence installation shall be kept to a minimum to prevent obstructions, provide proper drainage and smooth the area along the fence and around the posts.

Posts shall be set true and plumb in a vertical position. Hand set post holes shall be backfilled and tamped firmly to hold posts in position. Backfill shall be placed and tamped in a maximum of 6" lifts. Securely attach rails to posts and vertical and diagonal members as shown on the details.

Compensation

The work of furnishing and installing the ornamental wood fence, when completed and accepted, will be paid for the contract unit price per linear foot measured along the top surface of the fence, for "Ornamental Wood Fence". Such price shall be full payment, including but not limited to, all labor, materials, and any other incidentals necessary or required to complete the work.

Payment shall be made under:

Pay Item: Pay Unit
Ornamental Wood Fence Linear Foot

STANDARD SPECIAL PROVISION AVAILABILITY OF FUNDS – TERMINATION OF CONTRACTS

(5-20-08)

Z-2

General Statute 143C-6-11. (h) Highway Appropriation is hereby incorporated verbatim in this contract as follows:

(h) Amounts Encumbered. – Transportation project appropriations may be encumbered in the amount of allotments made to the Department of Transportation by the Director for the estimated payments for transportation project contract work to be performed in the appropriation fiscal year. The allotments shall be multiyear allotments and shall be based on estimated revenues and shall be subject to the maximum contract authority contained in General Statute 143C-6-11(c). Payment for transportation project work performed pursuant to contract in any fiscal year other than the current fiscal year is subject to appropriations by the General Assembly. Transportation project contracts shall contain a schedule of estimated completion progress, and any acceleration of this progress shall be subject to the approval of the Department of Transportation provided funds are available. The State reserves the right to terminate or suspend any transportation project contract, and any transportation project contract shall be so terminated or suspended if funds will not be available for payment of the work to be performed during that fiscal year pursuant to the contract. In the event of termination of any contract, the contractor shall be given a written notice of termination at least 60 days before completion of scheduled work for which funds are available. In the event of termination, the contractor shall be paid for the work already performed in accordance with the contract specifications.

Payment will be made on any contract terminated pursuant to the special provision in accordance with Subarticle 108-13(D) of the 2018 Standard Specifications.

STANDARD SPECIAL PROVISION NCDOT GENERAL SEED SPECIFICATION FOR SEED QUALITY

(5-17-11) Z-3

Seed shall be sampled and tested by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory. When said samples are collected, the vendor shall supply an independent laboratory report for each lot to be tested. Results from seed so sampled shall be final. Seed not meeting the specifications shall be rejected by the Department of Transportation and shall not be delivered to North Carolina Department of Transportation warehouses. If seed has been delivered it shall be available for pickup and replacement at the supplier's expense.

Any re-labeling required by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory, that would cause the label to reflect as otherwise specified herein shall be rejected by the North Carolina Department of Transportation.

Seed shall be free from seeds of the noxious weeds Johnsongrass, Balloonvine, Jimsonweed, Witchweed, Itchgrass, Serrated Tussock, Showy Crotalaria, Smooth Crotalaria, Sicklepod, Sandbur, Wild Onion, and Wild Garlic. Seed shall not be labeled with the above weed species on the seed analysis label. Tolerances as applied by the Association of Official Seed Analysts will NOT be allowed for the above noxious weeds except for Wild Onion and Wild Garlic.

Tolerances established by the Association of Official Seed Analysts will generally be recognized. However, for the purpose of figuring pure live seed, the found pure seed and found germination percentages as reported by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory will be used. Allowances, as established by the NCDOT, will be recognized for minimum pure live seed as listed on the following pages.

The specifications for restricted noxious weed seed refers to the number per pound as follows:

Restricted Noxious Weed	Limitations per Lb. Of Seed	Restricted Noxious Weed	Limitations per Lb. of Seed	
Blessed Thistle	4 seeds	Cornflower (Ragged Robin)	27 seeds	
Cocklebur	4 seeds	Texas Panicum	27 seeds	
Spurred Anoda	4 seeds	Bracted Plantain	54 seeds	
Velvetleaf 4 seeds		Buckhorn Plantain	54 seeds	
Morning-glory	8 seeds	Broadleaf Dock	54 seeds	
Corn Cockle	10 seeds	Curly Dock	54 seeds	
Wild Radish	12 seeds	Dodder	54 seeds	
Purple Nutsedge	27 seeds	Giant Foxtail	54 seeds	
Yellow Nutsedge	27 seeds	Horsenettle	54 seeds	
Canada Thistle	27 seeds	Quackgrass	54 seeds	
Field Bindweed	27 seeds	Wild Mustard	54 seeds	
Hedge Bindweed	27 seeds			

Seed of Pensacola Bahiagrass shall not contain more than 7% inert matter, Kentucky Bluegrass, Centipede and Fine or Hard Fescue shall not contain more than 5% inert matter whereas a maximum of 2% inert matter will be allowed on all other kinds of seed. In addition, all seed shall

not contain more than 2% other crop seed nor more than 1% total weed seed. The germination rate as tested by the North Carolina Department of Agriculture shall not fall below 70%, which includes both dormant and hard seed. Seed shall be labeled with not more than 7%, 5% or 2% inert matter (according to above specifications), 2% other crop seed and 1% total weed seed.

Exceptions may be made for minimum pure live seed allowances when cases of seed variety shortages are verified. Pure live seed percentages will be applied in a verified shortage situation. Those purchase orders of deficient seed lots will be credited with the percentage that the seed is deficient.

FURTHER SPECIFICATIONS FOR EACH SEED GROUP ARE GIVEN BELOW:

Minimum 85% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 83% pure live seed will not be approved.

Sericea Lespedeza Oats (seeds)

Minimum 80% pure live seed; maximum 1% total weed seed; maximum 2% total other crop; maximum 144 restricted noxious weed seed per pound. Seed less than 78% pure live seed will not be approved.

Tall Fescue (all approved varieties)

Kobe Lespedeza

Bermudagrass

Browntop Millet

Carpetgrass

Minimum 78% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 76% pure live seed will not be approved.

Common or Sweet Sundangrass

Minimum 76% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 74% pure live seed will not be approved.

Rye (grain; all varieties) Kentucky Bluegrass (all approved varieties) Hard Fescue (all approved varieties) Shrub (bicolor) Lespedeza

Minimum 70% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 noxious weed seed per pound. Seed less than 70% pure live seed will not be approved.

Centipedegrass Japanese Millet
Crownvetch Reed Canary Grass

Pensacola Bahiagrass Zoysia

Creeping Red Fescue

Minimum 70% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 5% inert matter; maximum 144 restricted noxious weed seed per pound.

Barnyard Grass
Big Bluestem
Little Bluestem
Bristly Locust
Birdsfoot Trefoil
Indiangrass
Orchardgrass
Switchgrass

Yellow Blossom Sweet Clover

ERRATA

(10-16-18) (Rev.2-16-21) Z-4

Revise the 2018 Standard Specifications as follows:

Division 6

Page 6-7, Article 609-1 DESCRIPTION, line 29, replace article number "609-10" with "609-9".

Division 7

Page 7-27, Article 725-1 MEASUREMENT AND PAYMENT, line 4, replace article number "725-1" with "724-4".

Page 7-28, Article 725-1 MEASUREMENT AND PAYMENT, line 10, replace article number "725-1" with "725-3".

Division 10

Page 10-78, Article 1056-4 GEOTEXTILES, TABLE 1056-1, Permittivity, Type 2, replace "Table 6^D" with "Table 7^D" and Permittivity, Type 3^B, replace "Table 7^D" with "Table 8^D".

Page 10-121, Article 1076-7, REPAIR OF GALVANIZING, line 8, replace article number "1080-9" with "1080-7".

Page 10-162, Article 1080-50 PAINT FOR VERTICAL MARKERS, line 1, replace article number "1080-50" with "1080-10".

Page 10-162, Article 1080-61 EPOXY RESIN FOR REINFORCING STEEL, line 5, replace article number "1080-61" with "1080-11".

Page 10-162, Article 1080-72 ABRASIVE MATERIALS FOR BLAST CLEANING STEEL, line 22, replace article number "1080-72" with "1080-12".

Page 10-163, Article 1080-83 FIELD PERFORMANCE AND SERVICES, line 25, replace article number "1080-83" with "1080-13".

Division 17

Page 17-15, Article 1715-4 MEASUREMENT AND PAYMENT, lines 42-44, replace the second sentence with the following:

An example is an installation of a single 1.25 inch HDPE conduit would be paid as:

Directional Drill (1)(1.25") Linear Foot

PLANT AND PEST QUARANTINES

(Imported Fire Ant, Gypsy Moth, Witchweed, Emerald Ash Borer, Guava Root Knot Nematode, And Other Noxious Weeds)

(3-18-03) (Rev. 5-21-19) Z-04a

Within Quarantined Area

This project may be within a county regulated for plant and/or pests. If the project or any part of the Contractor's operations is located within a quarantined area, thoroughly clean all equipment prior to moving out of the quarantined area. Comply with federal/state regulations by obtaining a certificate or limited permit for any regulated article moving from the quarantined area.

Originating in a Quarantined County

Obtain a certificate or limited permit issued by the N.C. Department of Agriculture/United States Department of Agriculture. Have the certificate or limited permit accompany the article when it arrives at the project site.

Contact

Contact the N.C. Department of Agriculture/United States Department of Agriculture at 1-800-206-9333, 919-707-3730, or https://www.ncagr.gov/plantindustry/Plant/quaran/table2.htm to determine those specific project sites located in the quarantined area or for any regulated article used on this project originating in a quarantined county.

Regulated Articles Include

- 1. Soil, sand, gravel, compost, peat, humus, muck, and decomposed manure, separately or with other articles. This includes movement of articles listed above that may be associated with cut/waste, ditch pulling, and shoulder cutting.
- 2. Plants with roots including grass sod.
- 3. Plant crowns and roots.
- 4. Bulbs, corms, rhizomes, and tubers of ornamental plants.
- 5. Hay, straw, fodder, and plant litter of any kind.
- 6. Clearing and grubbing debris.
- 7. Used agricultural cultivating and harvesting equipment.
- 8. Used earth-moving equipment.
- 9. Any other products, articles, or means of conveyance, of any character, if determined by an inspector to present a hazard of spreading imported fire ant, gypsy moth, witchweed, emerald ash borer, guava root knot nematode, or other noxious weeds.

MINIMUM WAGES

(7-21-09) Z-5

FEDERAL: The Fair Labor Standards Act provides that with certain exceptions every employer shall pay wages at the rate of not less than SEVEN DOLLARS AND TWENTY FIVE CENTS (\$7.25) per hour.

STATE: The North Carolina Minimum Wage Act provides that every employer shall pay to each of his employees, wages at a rate of not less than SEVEN DOLLARS AND TWENTY FIVE CENTS (\$7.25) per hour.

The minimum wage paid to all skilled labor employed on this contract shall be SEVEN DOLLARS AND TWENTY FIVE CENTS (\$7.25) per hour.

The minimum wage paid to all intermediate labor employed on this contract shall be SEVEN DOLLARS AND TWENTY FIVE CENTS (\$7.25) per hour.

The minimum wage paid to all unskilled labor on this contract shall be SEVEN DOLLARS AND TWENTY FIVE CENTS (\$7.25) per hour.

This determination of the intent of the application of this act to the contract on this project is the responsibility of the Contractor.

The Contractor shall have no claim against the Department of Transportation for any changes in the minimum wage laws, Federal or State. It is the responsibility of the Contractor to keep fully informed of all Federal and State Laws affecting his contract.

TITLE VI AND NONDISCRIMINATION:

(6-28-77)(Rev 6/19/2018)

Z-6

Revise the 2018 Standard Specifications as follows:

Replace Article 103-4(B) with the following:

The North Carolina Department of Transportation is committed to carrying out the U.S. Department of Transportation's policy of ensuring nondiscrimination in the award and administration of contracts.

The provisions of this section related to United States Department of Transportation (US DOT) Order 1050.2A, Title 49 Code of Federal Regulations (CFR) part 21, 23 United States Code (U.S.C.) 140 and 23 CFR part 200 (or 49 CFR 303, 49 U.S.C. 5332 or 49 U.S.C. 47123) are applicable to all North Carolina Department of Transportation (NCDOT) contracts and to all related subcontracts, material supply, engineering, architectural and other service contracts, regardless of dollar amount. Any Federal provision that is specifically required not specifically set forth is hereby incorporated by reference.

(1) Title VI Assurances (USDOT Order 1050.2A, Appendix A)

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

- (a) Compliance with Regulations
 - The contractor (hereinafter includes consultants) shall comply with the Acts and the Regulations relative to Nondiscrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
- (b) Nondiscrimination
 - The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.
- (c) Solicitations for Subcontractors, Including Procurements of Materials and Equipment In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Nondiscrimination on the grounds of race, color, or national origin.

(d) Information and Reports

The contractor shall provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the FHWA to be pertinent to ascertain compliance with such Acts,

Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor shall so certify to the Recipient or the FHWA, as appropriate, and shall set forth what efforts it has made to obtain the information.

(e) Sanctions for Noncompliance:

In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it and/or the FHWA may determine to be appropriate, including, but not limited to:

- (i) Withholding payments to the contractor under the contract until the contractor complies; and/or
- (ii) Cancelling, terminating, or suspending a contract, in whole or in part.

(f) Incorporation of Provisions

The contractor shall include the provisions of paragraphs (a) through (f) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor shall take action with respect to any subcontract or procurement as the Recipient or the FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

(2) Title VI Nondiscrimination Program (23 CFR 200.5(p))

The North Carolina Department of Transportation (NCDOT) has assured the USDOT that, as a condition to receiving federal financial assistance, NCDOT will comply with Title VI of the Civil Rights Act of 1964 and all requirements imposed by Title 49 CFR part 21 and related nondiscrimination authorities to ensure that no person shall, on the ground of race, color, national origin, limited English proficiency, sex, age, or disability (including religion/creed or income-level, where applicable), be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any programs, activities, or services conducted or funded by NCDOT. Contractors and other organizations under contract or agreement with NCDOT must also comply with Title VI and related authorities, therefore:

- (a) During the performance of this contract or agreement, contractors (e.g., subcontractors, consultants, vendors, prime contractors) are responsible for complying with NCDOT's Title VI Program. Contractors are not required to prepare or submit Title VI Programs. To comply with this section, the prime contractor shall:
 - 1. Post NCDOT's Notice of Nondiscrimination and the Contractor's own Equal Employment Opportunity (EEO) Policy in conspicuous locations accessible to all employees, applicants and subcontractors on the jobsite.
 - 2. Physically incorporate the required Title VI clauses into all subcontracts on federally-assisted and state-funded NCDOT projects, and ensure inclusion by subcontractors into all lower-tier subcontracts.
 - 3. Required Solicitation Language. The Contractor shall include the following notification in all solicitations for bids and requests for work or material, regardless of funding source:

"The North Carolina Department of Transportation, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 US.C. §§

2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award. In accordance with other related nondiscrimination authorities, bidders and contractors will also not be discriminated against on the grounds of sex, age, disability, low-income level, creed/religion, or limited English proficiency in consideration for an award."

- 4. Physically incorporate the FHWA-1273, in its entirety, into all subcontracts and subsequent lower tier subcontracts on Federal-aid highway construction contracts only.
- 5. Provide language assistance services (i.e., written translation and oral interpretation), free of charge, to LEP employees and applicants. Contact NCDOT OCR for further assistance, if needed.
- 6. For assistance with these Title VI requirements, contact the NCDOT Title VI Nondiscrimination Program at 1-800-522-0453.
- (b) Subrecipients (e.g. cities, counties, LGAs, planning organizations) may be required to prepare and submit a Title VI Plan to NCDOT, including Title VI Assurances and/or agreements. Subrecipients must also ensure compliance by their contractors and subrecipients with Title VI. (23 CFR 200.9(b)(7))
- (c) If reviewed or investigated by NCDOT, the contractor or subrecipient agrees to take affirmative action to correct any deficiencies found within a reasonable time period, not to exceed 90 calendar days, unless additional time is granted by NCDOT. (23 CFR 200.9(b)(15))
- (d) The Contractor is responsible for notifying subcontractors of NCDOT's External Discrimination Complaints Process.
 - 1. Applicability
 - Title VI and related laws protect participants and beneficiaries (e.g., members of the public and contractors) from discrimination by NCDOT employees, subrecipients and contractors, regardless of funding source.
 - 2. Eligibility
 - Any person—or class of persons—who believes he/she has been subjected to discrimination based on race, color, national origin, Limited English Proficiency (LEP), sex, age, or disability (and religion in the context of employment, aviation, or transit) may file a written complaint. The law also prohibits intimidation or retaliation of any sort.
 - 3. Time Limits and Filing Options
 - Complaints may be filed by the affected individual(s) or a representative and must be filed no later than 180 calendar days after the following:
 - (i) The date of the alleged act of discrimination; or
 - (ii) The date when the person(s) became aware of the alleged discrimination; or
 - (iii) Where there has been a continuing course of conduct, the date on which that conduct was discontinued or the latest instance of the conduct.

Title VI and related discrimination complaints may be submitted to the following entities:

- ➤ North Carolina Department of Transportation, Office of Civil Rights, Title VI Program, 1511 Mail Service Center, Raleigh, NC 27699-1511; toll free 1-800-522-0453
- ➤ Federal Highway Administration, North Carolina Division Office, 310 New Bern Avenue, Suite 410, Raleigh, NC 27601, 919-747-7010
- ➤ US Department of Transportation, Departmental Office of Civil Rights, External Civil Rights Programs Division, 1200 New Jersey Avenue, SE, Washington, DC 20590; 202-366-4070

4. Format for Complaints

Complaints must be in writing and signed by the complainant(s) or a representative, and include the complainant's name, address, and telephone number. Complaints received by fax or e-mail will be acknowledged and processed. Allegations received by telephone will be reduced to writing and provided to the complainant for confirmation or revision before processing. Complaints will be accepted in other languages, including Braille.

5. Discrimination Complaint Form
Contact NCDOT Civil Rights to receive a full copy of the Discrimination
Complaint Form and procedures.

6. Complaint Basis

Allegations must be based on issues involving race, color, national origin (LEP), sex, age, disability, or religion (in the context of employment, aviation or transit). "Basis" refers to the complainant's membership in a protected group category.

TABLE 103-1 COMPLAINT BASIS					
Protected Categories	Definition	Examples	Applicable Nondiscrimination Authorities		
Race and Ethnicity	An individual belonging to one of the accepted racial groups; or the perception, based usually on physical characteristics that a person is a member of a racial group	Black/African American, Hispanic/Latino, Asian, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, White	Title VI of the Civil Rights Act of 1964; 49 CFR Part 21; 23 CFR 200; 49 U.S.C. 5332(b); 49 U.S.C. 47123. (Executive Order 13166)		
Color	Color of skin, including shade of skin within a racial group	Black, White, brown, yellow, etc.			
National Origin (Limited English Proficiency)	Place of birth. Citizenship is not a factor. (Discrimination based on language or a person's accent is also covered)	Mexican, Cuban, Japanese, Vietnamese, Chinese			
Sex	Gender. The sex of an individual. Note: Sex under this program does not include sexual orientation.	Women and Men	1973 Federal-Aid Highway Act; 49 U.S.C. 5332(b); 49 U.S.C. 47123.		
Age	Persons of any age	21-year-old person	Age Discrimination Act of 1975 49 U.S.C. 5332(b); 49 U.S.C. 47123.		
Disability	Physical or mental impairment, permanent or temporary, or perceived.	Blind, alcoholic, para-amputee, epileptic, diabetic, arthritic	Section 504 of the Rehabilitation Act of 1973; Americans with Disabilities Act of 1990		

Religion (in the context of employment) (Religion/ Creed in all aspects of any aviation or transit-related construction)	An individual belonging to a religious group; or the perception, based on distinguishable characteristics that a person is a member of a religious group. In practice, actions taken as a result of the moral and ethical beliefs as to what is right and wrong, which are sincerely held with the strength of traditional religious views. <i>Note:</i> Does not have to be associated with a recognized religious group or church; if an individual sincerely holds to the belief, it is a protected religious practice.	Muslim, Christian, Sikh, Hindu, etc.	Title VII of the Civil Rights Act of 1964; 23 CFR 230; FHWA-1273 Required Contract Provisions. (49 U.S.C. 5332(b); 49 U.S.C. 47123)
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(3) Pertinent Nondiscrimination Authorities

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest agrees to comply with the following non-discrimination statutes and authorities, including, but not limited to:

- (a) Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.
- (b) The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- (c) Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 et seq.), (prohibits discrimination on the basis of sex):
- (d) Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.), as amended, (prohibits discrimination on the basis of disability) and 49 CFR Part 27;
- (e) The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age);
- (f) Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- (g) The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- (h) Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- (i) The Federal Aviation Administration's Nondiscrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- (j) Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures Nondiscrimination against minority populations by discouraging programs, policies, and activities with

- disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- (k) Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of Limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- (l) Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).
- (m)Title VII of the Civil Rights Act of 1964 (42 U.S.C. § 2000e et seq., Pub. L. 88-352), (prohibits employment discrimination on the basis of race, color, religion, sex, or national origin).

(4) Additional Title VI Assurances

- **The following Title VI Assurances (Appendices B, C and D) shall apply, as applicable
- (a) Clauses for Deeds Transferring United States Property (1050.2A, Appendix B) The following clauses will be included in deeds effecting or recording the transfer of real property, structures, or improvements thereon, or granting interest therein from the United States pursuant to the provisions of Assurance 4.

NOW, THEREFORE, the U.S. Department of Transportation as authorized by law and upon the condition that the North Carolina Department of Transportation (NCDOT) will accept title to the lands and maintain the project constructed thereon in accordance with the North Carolina General Assembly, the Regulations for the Administration of the Federal-Aid Highway Program, and the policies and procedures prescribed by the Federal Highway Administration of the U.S. Department of Transportation in accordance and in compliance with all requirements imposed by Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the U.S Department of Transportation pertaining to and effectuating the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. § 2000d to 2000d-4), does hereby remise, release, quitclaim and convey unto the NCDOT all the right, title and interest of the U.S. Department of Transportation in and to said lands described in Exhibit A attached hereto and made a part hereof.

(HABENDUM CLAUSE)

TO HAVE AND TO HOLD said lands and interests therein unto the North Carolina Department of Transportation (NCDOT) and its successors forever, subject, however, to the covenants, conditions, restrictions and reservations herein contained as follows, which will remain in effect for the period during which the real property or structures are used for a purpose for which Federal financial assistance is extended or for another purpose involving the provision of similar services or benefits and will be binding on the NCDOT, its successors and assigns.

The NCDOT, in consideration of the conveyance of said lands and interests in lands, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns, that (1) no person will on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over, or under such lands hereby conveyed [,] [and]* (2) that the NCDOT will use the lands and interests in lands and interests in lands so conveyed, in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the U.S. Department of Transportation, Effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations and Acts may be amended [, and (3) that in the event of breach of any of the above-mentioned nondiscrimination conditions, the Department will have a right to enter or re-enter said lands and facilities on said land, and that above described land and facilities will thereon revert to and vest in and become the absolute property of the U.S. Department of Transportation and its assigns as such interest existed prior to this instruction].*

- (*Reverter clause and related language to be used only when it is determined that such a clause is necessary in order to make clear the purpose of Title VI.)
- (b) Clauses for Transfer of Real Property Acquired or Improved Under the Activity, Facility, or Program (1050.2A, Appendix C)

 The following clauses will be included in deeds licenses league permits or similar

The following clauses will be included in deeds, licenses, leases, permits, or similar instruments entered into by the North Carolina Department of Transportation (NCDOT) pursuant to the provisions of Assurance 7(a):

- 1. The (grantee, lessee, permittee, etc. as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree [in the case of deeds and leases add "as a covenant running with the land"] that:
 - (i.) In the event facilities are constructed, maintained, or otherwise operated on the property described in this (deed, license, lease, permit, etc.) for a purpose for which a U.S. Department of Transportation activity, facility, or program is extended or for another purpose involving the provision of similar services or benefits, the (grantee, licensee, lessee, permittee, etc.) will maintain and operate such facilities and services in compliance with all requirements imposed by the Acts and Regulations (as may be amended) such that no person on the grounds of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities.
- 2. With respect to licenses, leases, permits, etc., in the event of breach of any of the above Nondiscrimination covenants, the NCDOT will have the right to terminate the (lease, license, permit, etc.) and to enter, re-enter, and repossess said lands and facilities thereon, and hold the same as if the (lease, license, permit, etc.) had never been made or issued. *
- 3. With respect to a deed, in the event of breach of any of the above Nondiscrimination covenants, the NCDOT will have the right to enter or re-enter the lands and facilities thereon, and the above described lands and facilities will there upon revert to and vest in and become the absolute property of the NCDOT and its assigns. *

- (*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)
- (c) Clauses for Construction/Use/Access to Real Property Acquired Under the Activity, Facility or Program (1050.2A, Appendix D)

The following clauses will be included in deeds, licenses, permits, or similar instruments/ agreements entered into by the North Carolina Department of Transportation (NCDOT) pursuant to the provisions of Assurance 7(b):

- 1. The (grantee, licensee, permittee, etc., as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree (in the case of deeds and leases add, "as a covenant running with the land") that (1) no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities, (2) that in the construction of any improvements on, over, or under such land, and the furnishing of services thereon, no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination, (3) that the (grantee, licensee, lessee, permittee, etc.) will use the premises in compliance with all other requirements imposed by or pursuant to the Acts and Regulations, as amended, set forth in this Assurance.
- 2. With respect to (licenses, leases, permits, etc.), in the event of breach of any of the above Non¬ discrimination covenants, the NCDOT will have the right to terminate the (license, permit, etc., as appropriate) and to enter or re-enter and repossess said land and the facilities thereon, and hold the same as if said (license, permit, etc., as appropriate) had never been made or issued. *
- 3. With respect to deeds, in the event of breach of any of the above Nondiscrimination covenants, the NCDOT will there upon revert to and vest in and become the absolute property of the NCDOT and its assigns. *

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

ON-THE-JOB TRAINING

(10-16-07) (Rev. 4-21-15)

Z-10

Description

The North Carolina Department of Transportation will administer a custom version of the Federal On-the-Job Training (OJT) Program, commonly referred to as the Alternate OJT Program. All contractors (existing and newcomers) will be automatically placed in the Alternate Program. Standard OJT requirements typically associated with individual projects will no longer be applied at the project level. Instead, these requirements will be applicable on an annual basis for each contractor administered by the OJT Program Manager.

On the Job Training shall meet the requirements of 23 CFR 230.107 (b), 23 USC – Section 140, this provision and the On-the-Job Training Program Manual.

The Alternate OJT Program will allow a contractor to train employees on Federal, State and privately funded projects located in North Carolina. However, priority shall be given to training employees on NCDOT Federal-Aid funded projects.

Minorities and Women

Developing, training and upgrading of minorities and women toward journeyman level status is a primary objective of this special training provision. Accordingly, the Contractor shall make every effort to enroll minority and women as trainees to the extent that such persons are available within a reasonable area of recruitment. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

Assigning Training Goals

The Department, through the OJT Program Manager, will assign training goals for a calendar year based on the contractors' past three years' activity and the contractors' anticipated upcoming year's activity with the Department. At the beginning of each year, all contractors eligible will be contacted by the Department to determine the number of trainees that will be assigned for the upcoming calendar year. At that time the Contractor shall enter into an agreement with the Department to provide a self-imposed on-the-job training program for the calendar year. This agreement will include a specific number of annual training goals agreed to by both parties. The number of training assignments may range from 1 to 15 per contractor per calendar year. The Contractor shall sign an agreement to fulfill their annual goal for the year.\

Training Classifications

The Contractor shall provide on-the-job training aimed at developing full journeyman level workers in the construction craft/operator positions. Preference shall be given to providing training in the following skilled work classifications:

Equipment Operators Office Engineers

Truck Drivers Estimators

Carpenters Iron / Reinforcing Steel Workers

Concrete Finishers Mechanics
Pipe Layers Welders

The Department has established common training classifications and their respective training requirements that may be used by the contractors. However, the classifications established are not all-inclusive. Where the training is oriented toward construction applications, training will be allowed in lower-level management positions such as office engineers and estimators. Contractors shall submit new classifications for specific job functions that their employees are performing. The Department will review and recommend for acceptance to FHWA the new classifications proposed by contractors, if applicable. New classifications shall meet the following requirements:

Proposed training classifications are reasonable and realistic based on the job skill classification needs, and

The number of training hours specified in the training classification is consistent with common practices and provides enough time for the trainee to obtain journeyman level status.

The Contractor may allow trainees to be trained by a subcontractor provided that the Contractor retains primary responsibility for meeting the training and this provision is made applicable to the subcontract. However, only the Contractor will receive credit towards the annual goal for the trainee.

Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. The number of trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment.

No employee shall be employed as a trainee in any classification in which they have successfully completed a training course leading to journeyman level status or in which they have been employed as a journeyman.

Records and Reports

The Contractor shall maintain enrollment, monthly and completion reports documenting company compliance under these contract documents. These documents and any other information as requested shall be submitted to the OJT Program Manager.

Upon completion and graduation of the program, the Contractor shall provide each trainee with a certification Certificate showing the type and length of training satisfactorily completed.

Trainee Interviews

All trainees enrolled in the program will receive an initial and Trainee/Post graduate interview conducted by the OJT program staff.

Trainee Wages

Contractors shall compensate trainees on a graduating pay scale based upon a percentage of the prevailing minimum journeyman wages (Davis-Bacon Act). Minimum pay shall be as follows:

60 percent	of the journeyman wage for the first half of the training period
75 percent	of the journeyman wage for the third quarter of the training period
90 percent	of the journeyman wage for the last quarter of the training period

In no instance shall a trainee be paid less than the local minimum wage. The Contractor shall adhere to the minimum hourly wage rate that will satisfy both the NC Department of Labor (NCDOL) and the Department.

Achieving or Failing to Meet Training Goals

The Contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and who receives training for at least 50 percent of the specific program requirement. Trainees will be allowed to be transferred between projects if required by the Contractor's scheduled workload to meet training goals.

If a contractor fails to attain their training assignments for the calendar year, they may be taken off the NCDOT's Bidders List.

Measurement and Payment

No compensation will be made for providing required training in accordance with these contract documents.

PROJECT SPECIAL PROVISIONS

GEOTECHNICAL

MSE RETAINING WALLS - (10/19/2021)	GT-1.1	- GT-1.12
GEOTEXTILE FOR PAVEMENT STABILIZATION (SPECIAL)	GT-2.1	- GT-2.2
CLASS IV SUBGRADE STABILIZATION IN LIEU OF CHEMICAL STABILIZATION (SPECIAL)	GT-3.1	- GT-3.2

Geotechnical Engineering Unit E06538624A11498...
7/21/2021

MECHANICALLY STABILIZED EARTH RETAINING WALLS

(10-19-21)

1.0 GENERAL

Construct mechanically stabilized earth (MSE) retaining walls consisting of steel or geosynthetic reinforcement in the reinforced zone connected to vertical facing elements. Use precast concrete panels for vertical facing elements and coarse aggregate in the reinforced zone unless noted otherwise in the plans. Provide reinforced concrete coping and pile sleeves as required. Design and construct MSE retaining walls based on actual elevations and wall dimensions in accordance with the contract and accepted submittals. Use a prequalified MSE Wall Installer to construct MSE retaining walls.

Define MSE wall terms as follows:

Geosynthetic Reinforcement – Polyester Type (PET), HDPE or Polypropylene (PP) geosynthetic grids, i.e., geogrid reinforcement or polymer straps, i.e., geostrip reinforcement,

Geogrid – PET, HDPE or PP geogrid,

Reinforcement – Steel or geosynthetic reinforcement,

Aggregate – Coarse or fine aggregate,

Panel – Precast concrete panel,

Coping – Precast or CIP concrete coping,

Design Height (H) – Wall height + wall embedment as shown in the plans,

MSE Wall – Mechanically stabilized earth retaining wall,

MSE Wall Vendor - Vendor supplying the chosen MSE wall system,

MSE Panel Wall – MSE wall with panels,

MSE Segmental Wall – MSE wall with segmental retaining wall (SRW) units and

Abutment Wall – MSE wall with bridge foundations in any portion of the reinforced zone or an MSE wall connected to an abutment wall (even if bridge foundations only penetrate a small part of the reinforced zone, the entire MSE wall is considered an abutment wall).

For bridge approach fills behind end bents with MSE abutment walls, design reinforcement connected to end bent caps in accordance with the plans and this provision. Construct Type III Reinforced Bridge Approach Fills in accordance with the *Bridge Approach Fills* provision and Roadway Detail Drawing No. 422D10.

Use an approved MSE wall system in accordance with the plans and any NCDOT restrictions or exceptions for the chosen system. Value engineering proposals for other MSE wall systems will not be considered. Do not use MSE wall systems with an "approved for provisional use" status for MSE walls with design heights greater than 35 ft or walls supporting or adjacent to railroads or interstate highways. The list of approved MSE wall systems with approval status is available from:

connect.ncdot.gov/resources/Geological/Pages/Products.aspx

2.0 MATERIALS

Refer to the Standard Specifications.

Item Section

Aggregate Asphalt Concrete Base Course, Type B25.0C Corrugated Steel Pipe	1014 620 1032-3
Epoxy, Type 3A	1081
Geosynthetics	1056
Grout, Type 3	1003
Joint Materials	1028
Portland Cement Concrete, Class A	1000
Precast Retaining Wall Coping	1077
Reinforcing Steel	1070
Retaining Wall Panels	1077
Segmental Retaining Wall Units	1040-4
Select Material, Class V	1016
Shoulder Drain Materials	816-2
Steel Pipe	1036-4(A)

Use galvanized corrugated steel pipe with a zinc coating weight of 2 oz/sf (G200) for pile sleeves. Provide Type 2 geotextile for filtration and separation geotextiles. Use Class A concrete for CIP coping, leveling concrete and pads. Use galvanized steel pipe, threaded rods and nuts for the PET geogrid reinforcement vertical obstruction detail. Provide galvanized Grade 36 anchor rods and Grade A hex nuts that meet AASHTO M 314 for threaded rods and nuts.

Use panels and SRW units from producers approved by the Department and licensed by the MSE Wall Vendor. Provide steel strip connectors embedded in panels fabricated from structural steel that meets the requirements for steel strip reinforcement. Unless required otherwise in the contract, produce panels with a smooth flat final finish that meets Article 1077-11 of the *Standard Specifications*. Accurately locate and secure reinforcement connectors in panels and maintain required concrete cover. Produce panels within 1/4" of the panel dimensions shown in the accepted submittals.

Damaged panels or SRW units with excessive discoloration, chips or cracks as determined by the Engineer will be rejected. Do not damage reinforcement connection devices or mechanisms in handling or storing panels and SRW units.

Store steel materials on blocking at least 12" above the ground and protect it at all times from damage; and when placing in the work make sure it is free from dirt, dust, loose mill scale, loose rust, paint, oil or other foreign materials. Handle and store geosynthetics in accordance with Article 1056-2 of the *Standard Specifications*. Load, transport, unload and store MSE wall materials so materials are kept clean and free of damage. Bent, damaged or defective materials will be rejected.

A. Aggregate

Use standard size No. 57, 57M, 67 or 78M that meets Table 1005-1 of the *Standard Specifications* for coarse aggregate and the following for fine aggregate:

1. Standard size No. 1S, 2S, 2MS or 4S that meets Table 1005-2 of the Standard

Specifications or

2. Gradation that meets Class III, Type 3 select material in accordance with Article 1016-3 of the *Standard Specifications*.

Fine aggregate is exempt from mortar strength in Subarticle 1014-1(E) of the *Standard Specifications*. Use fine aggregate with a maximum organic content of 1.0%. Provide aggregate with chemical properties that meet the following requirements:

AGGREGATE pH REQUIREMENTS			
Aggregate Type (in reinforced zone) Reinforcement or Connector Material		pН	
Coarse or Fine	Steel	5 – 10	
Coarse or Fine	Geosynthetic	4.5 – 9	

AGGREGATE ELECTROCHEMICAL REQUIREMENTS (Steel Reinforcement/Connector Materials Only)			
Aggregate Type (in reinforced zone) Resistivity		Chlorides	Sulfates
Coarse	\geq 5,000 $\Omega \cdot \text{cm}$	< 100	< 200
Fine	\geq 3,000 $\Omega \cdot \text{cm}$	≤ 100 ppm	≤ 200 ppm

Use aggregate from sources participating in the Department's Aggregate QC/QA Program as described in Section 1006 of the *Standard Specifications*. Sample and test aggregate in accordance with the *Mechanically Stabilized Earth Wall Aggregate Sampling and Testing Procedures*.

B. Reinforcement

Provide steel or geosynthetic reinforcement supplied by the MSE Wall Vendor or a manufacturer approved or licensed by the vendor. Use reinforcement approved for the chosen MSE wall system. The list of approved reinforcement for each MSE wall system is available from the website shown elsewhere in this provision.

1. Steel Reinforcement

Provide Type 1 material certifications in accordance with Article 106-3 of the *Standard Specifications* for steel reinforcement. Use welded wire grid reinforcement ("mesh", "mats" and "ladders") that meet Article 1070-3 of the *Standard Specifications* and steel strip reinforcement ("straps") that meet ASTM A572, A1011 or A463. Use 10 gauge or heavier structural steel Grade 50 or higher for steel strip reinforcement. Galvanize steel reinforcement in accordance with Section 1076 of the *Standard Specifications* or provide aluminized steel strip reinforcement that meet ASTM A463, Type 2-100.

2. Geosynthetic Reinforcement

Provide Type 1 material certifications and identify geosynthetic reinforcement in accordance with Article 1056-3 of the *Standard Specifications*. Define machine direction (MD) and cross-machine direction (CD) for geogrids per Article 1056-3 of the *Standard Specifications*.

Use HDPE or PP geogrid for geogrid reinforcement cast into backwalls of end bent caps. Use PET or HDPE geogrid for geogrid reinforcement connected directly to SRW units and only HDPE geogrid for geogrid reinforcement cast into panels.

Provide extruded geogrids produced in the United States and manufactured from punched and drawn polypropylene sheets for PP geogrids that meet the following:

PP GEOGRID REQUIREMENTS			
Property	Requirement ¹	Test Method	
Aperture Dimensions ²	1" x 1.2"	N/A	
Minimum Rib Thickness ²	0.07" x 0.07"	N/A	
Tensile Strength @ 2% Strain ²	580 lb/ft x 690 lb/ft	ASTM D6637,	
Tensile Strength @ 5% Strain ²	1,200 lb/ft x 1,370 lb/ft	Method B	
Ultimate Tensile Strength ²	1,850 lb/ft x 2,050 lb/ft	Method B	
Junction Efficiency ³	93%	ASTM D7737	
(MD)	9370	ASIM DIISI	
Flexural Rigidity ⁴	2,000,000 mg-cm	ASTM D7748	
Aperture Stability Modulus ⁵	0.55 lb-ft/degrees	ASTM D7864	
UV Stability	100%	ASTM D4355	
(Retained Strength)	(after 500 hr of exposure)	AS 1101 D4555	

- **1.** MARV per Article 1056-3 of the *Standard Specifications* except dimensions and thickness are nominal.
- 2. Requirement for MD x CD.
- 3. Junction Efficiency (%) = (Average Junction Strength (Xj_{ave}) / Ultimate Tensile Strength in the MD from ASTM D6637, Method A) × 100.
- **4.** Test specimens two ribs wide, with transverse ribs cut flush with exterior edges of longitudinal ribs, and sufficiently long to enable measurement of the overhang dimension.
- **5.** Applied moment of 17.7 lb—inch (torque increment).

C. Bearing Pads

For MSE panel walls, use preformed ethylene propylene diene monomer rubber bearing pads that meet ASTM D2000 Grade 2, Type A, Class A with a durometer hardness of $60 \text{ or } 80 \pm 5$. Provide bearing pads with thicknesses that meet the following:

BEARING PAD THICKNESS		
Facing Area per Panel (A) Minimum Pad Thickness After Compress (based on 2 times panel weight above page		
$A \le 30 \text{ sf}$	1/2"	
$30 \text{ sf} < A \le 75 \text{ sf}$	3/4"	

D. Miscellaneous Components

Miscellaneous components may include connectors (e.g., anchors, bars, clamps, pins, plates, ties, etc.), fasteners (e.g., bolts, nuts, washers, etc.) and any other MSE wall components not included above. Use 10 gauge or heavier structural steel Grade 50 or higher for steel strip panel anchors and connectors. Galvanize steel components in accordance with Section 1076 of the *Standard Specifications*. Provide miscellaneous components approved for the chosen MSE wall system. The list of approved miscellaneous components for each MSE wall system is available from the website shown elsewhere in this provision.

3.0 PRECONSTRUCTION REQUIREMENTS

A. MSE Wall Surveys

The Retaining Wall Plans show a plan view, typical sections, details, notes and an elevation or profile view (wall envelope) for each MSE wall. Before beginning MSE wall design, survey existing ground elevations shown in the plans and other elevations in the vicinity of MSE wall locations as needed. For proposed slopes above or below MSE walls, survey existing ground elevations to at least 10 ft beyond slope stake points. Based on these elevations, finished grades and actual MSE wall dimensions and details, submit revised wall envelopes for acceptance. Use accepted wall envelopes for design.

B. MSE Wall Designs

For MSE wall designs, submit PDF files of working drawings and design calculations at least 30 days before the preconstruction meeting. Note name and NCDOT ID number of the panel or SRW unit production facility on working drawings. Do not begin MSE wall construction until a design submittal is accepted.

Use a prequalified MSE Segmental Wall Design Consultant to design MSE segmental walls. Provide MSE segmental wall designs sealed by a Design Engineer approved as a Geotechnical Engineer (key person) for the MSE Segmental Wall Design Consultant. Provide MSE panel wall designs sealed by a Design Engineer licensed in the state of North Carolina and employed or contracted by the MSE Wall Vendor.

Design MSE walls in accordance with the plans, AASHTO LRFD Bridge Design Specifications and any NCDOT restrictions for the chosen MSE wall system unless otherwise required. For abutment walls only, design MSE walls for seismic if wall sites meet either or both of the following:

- Wall site is in seismic zone 2 based on Figure 2-1 of the Structure Design Manual,
- Wall site is classified as AASHTO Site Class E, as noted in the plans, and is in or west of Pender, Duplin, Wayne, Johnston, Wake, Durham or Person County.

Connect reinforcement to panels or SRW units with methods or devices approved for the chosen system. Use a uniform reinforcement length throughout the height of the wall of at least 0.7H or 6 ft, whichever is longer, unless noted otherwise in the plans. Extend the reinforced zone at least 6" beyond end of reinforcement. Do not locate drains, the reinforced zone or leveling pads outside right-of-way or easement limits.

Use the simplified method for determining maximum reinforcement loads and design parameters approved for the chosen MSE wall system or default values in accordance with the AASHTO LRFD specifications. Design steel components including reinforcement and connectors for the design life noted in the plans and aggregate type in the reinforced zone. If an MSE wall system with geosynthetic reinforcement includes any steel parts for obstructions, bin walls, connections or other components, design steel exposed to aggregate for the design life noted in the plans and aggregate type in the reinforced zone. Use "loss of galvanizing" metal loss rates for nonaggressive backfill in accordance with the AASHTO LRFD specifications for galvanized and aluminized steel and metal loss rates for carbon steel in accordance with the following:

CARBON STEEL CORROSION RATES		
Aggregate Type (in reinforced zone)	Carbon Steel Loss Rate (after coating depletion)	
Coarse	0.47 mil/year	
Fine (except abutment walls)	0.58 mil/year	
Fine (abutment walls)	0.70 mil/year	

For PET or HDPE geogrid and geostrip reinforcement and geosynthetic connectors, use approved geosynthetic properties for the design life noted in the plans and aggregate type in the reinforced zone. For geogrid reinforcement connected to end bent caps, embed reinforcement or connectors in caps as shown in the plans. For PP geogrid reinforcement connected to end bent caps, use the following design parameters for the aggregate type in the reinforced approach fill.

PP GEOGRID REINFORCEMENT DESIGN PARAMETERS				
Aggregate Type (in reinforced zone)	T _{al} (MD)	F *	α	ρ
Coarse	400 lb/ft	0.70	0.8	32.0°
Fine	428 lb/ft	0.54	0.8	28.35°

Where,

T_{al} = long-term design strength (LTDS),

F* = pullout resistance factor,

 α = scale effect correction factor and

 ρ = soil-geogrid friction angle.

When noted in the plans, design MSE walls for a live load (traffic) surcharge of 250 psf in accordance with Figure C11.5.6-3(b) of the AASHTO LRFD specifications. For steel beam guardrail with 8 ft posts or concrete barrier rail above MSE walls, analyze top 2 reinforcement layers for traffic impact loads in accordance with Section 7.2 of FHWA Design and Construction of Mechanically Stabilized Earth Walls and

Reinforced Soil Slopes – Volume I (Publication No. FHWA-NHI-10-024) except use the following for geosynthetic reinforcement rupture:

$$\phi T_{al} R_c \ge T_{max} + (T_I / RF_{CR})$$

Where,

φ = resistance factor for tensile resistance in accordance with Section 7.2.1 of the FHWA MSE wall manual.

T_{al} = long-term geosynthetic design strength approved for chosen MSE wall

R_c = reinforcement coverage ratio = 1 for continuous geosynthetic reinforcement.

 T_{max} = factored static load in accordance with Section 7.2 of the FHWA MSE wall manual.

T_I = factored impact load in accordance with Section 7.2 of the FHWA MSE wall manual and

 RF_{CR} = creep reduction factor approved for chosen MSE wall system.

When shown in the plans for abutment walls, use pile sleeves to segregate piles from aggregate in the reinforced zone. If existing or future obstructions such as foundations, guardrail, fence or handrail posts, moment slabs, pavements, pipes, inlets or utilities will interfere with reinforcement, maintain a clearance of at least 3" between obstructions and reinforcement unless otherwise approved. Design reinforcement for obstructions and locate reinforcement layers so all of reinforcement length is within 3" of corresponding connection elevations. Modify PET geogrid reinforcement for obstructions as shown in the plans.

Use 6" thick CIP unreinforced concrete leveling pads beneath panels and SRW units that are continuous at steps and extend at least 6" in front of and behind bottom row of panels or SRW units. Unless required otherwise in the plans, embed top of leveling pads in accordance with the following requirements:

WALL EMBEDMENT REQUIREMENTS			
Front Slope ¹ Minimum Embedment Depth (H:V) (whichever is greater)			
6:1 or flatter (except abutment walls)	H/20	1 ft for $H \le 10$ ft 2 ft for $H > 10$ ft	
6:1 or flatter (abutment walls)	H/10	2 ft	
> 6:1 to < 3:1	H/10	2 ft	
3:1 to 2:1	H/7	2 ft	

1. Front slope is as shown in the plans.

2. H is the maximum design height per wall.

When noted in the plans, locate a continuous aggregate shoulder drain along the base of the reinforced zone behind the aggregate. Provide wall drainage systems consisting of drains and outlet components in accordance with Roadway Standard Drawing No. 816.02.

For MSE panel walls, cover joints at back of panels with filtration geotextiles at least 12" wide. If the approval of the chosen MSE wall system does not require a minimum number of bearing pads, provide the number of pads in accordance with the following:

NUMBER OF BEARING PADS			
Facing Area per Panel (A)	Maximum Height of Wall Above Horizontal Panel Joint	Minimum Number of Pads per Horizontal Panel Joint	
$A \le 30 \text{ sf}$	25 ft	2	
$A \leq 30.81$	35 ft ¹	3	
$30 \text{ sf} < A \le 75 \text{ sf}$	25 ft	3	
	35 ft ¹	4	

1. Additional bearing pads per horizontal panel joint may be required for wall heights above joints greater than 35 ft.

For MSE segmental walls, coarse aggregate is required in any SRW unit core spaces and between and behind SRW units for a horizontal distance of at least 18".

Separation geotextiles are required between the aggregate and overlying fill sections. When noted in the plans, separation geotextiles are also required at the back of the reinforced zone between the aggregate and backfill or natural ground. When placing pavement sections directly on the reinforced zone, cap aggregate with 4" of asphalt concrete base course. Unless required otherwise in the plans, use reinforced concrete coping at top of walls that meets the following requirements:

- 1. Coping dimensions as shown in the plans,
- 2. At the Contractor's option, coping that is precast or CIP concrete for MSE panel walls unless CIP coping is required as shown in the plans,
- 3. CIP concrete coping for MSE segmental walls and
- 4. At the Contractor's option and when shown in the plans, CIP concrete coping that extends down back of panels or SRW units or connects to panels or SRW units with dowels.

For MSE segmental walls with dowels, attach dowels to top courses of SRW units in accordance with the following:

- 1. Set dowels in core spaces of SRW units filled with grout instead of coarse aggregate or
- 2. Embed adhesively anchored dowels in holes of solid SRW units with epoxy.

For MSE panel walls with coping, connect CIP concrete coping or leveling concrete for precast concrete coping to top row of panels with dowels cast into panels. When concrete barrier rail is required above MSE walls, use concrete barrier rail with moment slab as shown in the plans.

Submit working drawings and design calculations for acceptance in accordance with

Article 105-2 of the Standard Specifications. Submit working drawings showing plan views, wall profiles with foundation pressures, typical sections with reinforcement and connection details, aggregate locations and types, geotextile locations and details of leveling pads, panels or SRW units, coping, bin walls, slip joints, pile sleeves, etc. If necessary, include details on working drawings for concrete barrier rail with moment slab, reinforcement splices if allowed for the chosen MSE wall system, reinforcement connected to end bent caps, curved MSE walls with tight (short) radii and obstructions extending through walls or interfering with reinforcement, leveling pads, barriers or Submit design calculations for each wall section with different moment slabs. surcharge loads, geometry or material parameters. At least one analysis is required for each wall section with different reinforcement lengths. When designing MSE walls with computer software other than MSEW, use MSEW manufactured by ADAMA Engineering, Inc. to verify the design. At least one MSEW analysis is required per 100 ft of wall length with at least one analysis for the wall section with the longest reinforcement. Submit electronic MSEW input files and PDF output files with design calculations.

C. Preconstruction Meeting

Before starting MSE wall construction, hold a preconstruction meeting to discuss the construction and inspection of the MSE walls. If this meeting occurs before all MSE wall submittals have been accepted, additional preconstruction meetings may be required before beginning construction of MSE walls without accepted submittals. The Resident or Bridge Maintenance Engineer, Area Construction Engineer, Geotechnical Operations Engineer, Contractor and MSE Wall Installer Superintendent will attend preconstruction meetings.

4.0 CORROSION MONITORING

Corrosion monitoring is required for MSE walls with steel reinforcement. The Engineer will determine the number of monitoring locations and where to install the instrumentation. Contact M&T before beginning wall construction. M&T will provide the corrosion monitoring instrumentation kits and if necessary, assistance with installation.

5.0 SITE ASSISTANCE

Unless otherwise approved, an MSE Wall Vendor representative is required to assist and guide the MSE Wall Installer on-site for at least 8 hours when the first panels or SRW units and reinforcement layer are placed. If problems are encountered during construction, the Engineer may require the vendor representative to return to the site for a time period determined by the Engineer.

6.0 Construction Methods

Control drainage during construction in the vicinity of MSE walls. Direct run off away from MSE walls, aggregate and backfill. Contain and maintain aggregate and backfill and protect material from erosion.

Excavate as necessary for MSE walls in accordance with the accepted submittals. If applicable and at the Contractor's option, use temporary shoring for wall construction instead of temporary slopes to construct MSE walls. Define "temporary shoring for wall construction" as temporary shoring not shown in the plans or required by the Engineer including shoring for OSHA reasons or the Contractor's convenience.

Unless required otherwise in the plans, install foundations and if required, pile sleeves located in the reinforced zone before placing aggregate or reinforcement. Brace piles in the reinforced zone to maintain alignment when placing and compacting aggregate. Secure piles together with steel members near top of piles. Clamp members to piles instead of welding if bracing is at or below pile cut-off elevations.

Notify the Engineer when foundation excavation is complete. Do not place leveling pad concrete, aggregate or reinforcement until excavation dimensions and foundation material are approved.

Construct CIP concrete leveling pads at elevations and with dimensions shown in the accepted submittals and in accordance with Section 420 of the *Standard Specifications*. Cure leveling pads at least 24 hours before placing panels or SRW units.

Erect and support panels and stack SRW units so the final wall position is as shown in the accepted submittals. Stagger SRW units to create a running bond by centering SRW units over joints in the row below as shown in the accepted submittals. Space bearing pads in horizontal panel joints as shown in the accepted submittals and cover all panel joints with filtration geotextiles as shown in the accepted submittals. Attach filtration geotextiles to back of panels with adhesives, tapes or other approved methods.

Construct MSE walls with the following tolerances:

- A. SRW units are level from front to back and between units when checked with a 4 ft long level,
- B. Vertical joint widths are 1/4" maximum for SRW units and 3/4", $\pm 1/4$ " for panels,
- C. Final wall face is within 3/4" of horizontal and vertical alignment shown in the accepted submittals when measured along a 10 ft straightedge and
- D. Final wall plumbness (batter) is not negative (wall face leaning forward) and within 0.5° of vertical unless otherwise approved.

Place reinforcement at locations and elevations shown in the accepted submittals and within 3" of corresponding connection elevations. Install reinforcement with the direction shown in the accepted submittals. Before placing aggregate, pull geosynthetic reinforcement taut so it is in tension and free of kinks, folds, wrinkles or creases. Reinforcement may be spliced once per reinforcement length if shown in the accepted submittals. Use reinforcement pieces at least 6 ft long. Contact the Engineer when unanticipated existing or future obstructions such as foundations, guardrail, fence or handrail posts, pavements, pipes, inlets or utilities will interfere with reinforcement. To avoid obstructions, deflect, skew or modify reinforcement as shown in the accepted submittals.

Place aggregate in the reinforced zone in 8" to 10" thick lifts. Compact fine aggregate in accordance with Subarticle 235-3(C) of the *Standard Specifications*. Use only hand operated compaction equipment to compact aggregate within 3 ft of panels or SRW units. At a distance greater than 3 ft, compact aggregate with at least 4 passes of an 8 ton to 10 ton vibratory roller in a direction parallel to the wall face. Smooth wheeled or rubber tired rollers are also acceptable for compacting aggregate. Do not use sheepsfoot, grid rollers or other types of compaction equipment with feet. Do not displace or damage reinforcement when placing and compacting aggregate. End dumping directly on geosynthetics is not permitted. Do not operate heavy equipment on reinforcement until it is covered with at least 8" of aggregate. Replace any damaged reinforcement to the satisfaction of the Engineer.

Backfill for MSE walls outside the reinforced zone in accordance with Article 410-8 of the *Standard Specifications*. If a drain is required, install wall drainage systems as shown in the accepted submittals and in accordance with Section 816 of the *Standard Specifications*. If pile sleeves are required, fill sleeves with loose uncompacted sand before constructing end bent caps.

Install dowels as necessary for SRW units and place and construct coping and leveling concrete as shown in the accepted submittals. Construct leveling concrete in accordance with Section 420 of the *Standard Specifications*. Construct CIP concrete coping in accordance with Subarticle 452-4(B) of the *Standard Specifications*. When single faced precast concrete barrier is required in front of and against MSE walls, stop coping just above barrier so coping does not interfere with placing barrier up against wall faces. If the gap between a single faced barrier and wall face is wider than 2", fill gap with Class V select material (standard size No. 78M stone). Otherwise, fill gap with backer rod and seal joint between barrier and MSE wall with silicone sealant.

When separation geotextiles are required, overlap adjacent geotextiles at least 18" and hold geotextiles in place with wire staples or anchor pins as needed. Seal joints above and behind MSE walls between coping and concrete slope protection with silicone sealant.

7.0 MEASUREMENT AND PAYMENT

MSE Retaining Wall No. __ will be measured and paid in square feet. MSE walls will be measured as the square feet of wall face area with the pay height equal to the difference between top of wall and top of leveling pad elevations. Define "top of wall" as top of coping or top of panels or SRW units for MSE walls without coping.

The contract unit price for MSE Retaining Wall No. __ will be full compensation for providing designs, submittals, labor, tools, equipment and MSE wall materials, excavating, hauling and removing excavated materials, placing and compacting aggregate and backfill material and supplying site assistance, leveling pads, panels, SRW units, reinforcement, aggregate, wall drainage systems, geotextiles, aggregate concrete base course, bearing pads, coping, miscellaneous components and any incidentals necessary to construct MSE walls. The contract unit price for MSE Retaining Wall No. __ will also be full compensation for reinforcement and connector design for reinforcement connected to end

bent caps, wall modifications for obstructions, pile sleeves filled with sand, joints sealed with silicone sealant and gaps between barriers and MSE walls filled with backer rod or No. 78M stone, if required.

No separate payment will be made for temporary shoring for wall construction. Temporary shoring for wall construction will be incidental to the contract unit price for *MSE Retaining Wall No.* ___.

The contract unit price for MSE Retaining Wall No. __ does not include the cost for ditches, fences, handrails, barrier or guardrail associated with MSE walls as these items will be paid for elsewhere in the contract. The contract unit price for MSE Retaining Wall No. __ also does not include the cost for constructing bridge approach fills behind end bents with MSE abutment walls. See Bridge Approach Fills provision for measurement and payment of Type III Reinforced Bridge Approach Fills.

Where it is necessary to provide backfill material behind the reinforced zone from sources other than excavated areas or borrow sources used in connection with other work in the contract, payment for furnishing and hauling such backfill material will be paid as extra work in accordance with Article 104-7 of the *Standard Specifications*. Placing and compacting such backfill material is not considered extra work but is incidental to the work being performed.

Payment will be made under:

Pay Item

MSE Retaining Wall No. ___

Pay Unit Square Foot



Scott A. Hidden
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6/29/2021

GEOTEXTILE FOR PAVEMENT STABILIZATION:

(SPECIAL)

Description

Supply and install geotextile for pavement stabilization in accordance with the contract. Geotextile for pavement stabilization may be required above chemically stabilized subgrades or below Class IV subgrade stabilization to prevent pavement cracking at locations shown in the plans and as directed. Define "subbase" as the portion of the roadbed below the Class IV subgrade stabilization.

Materials

Refer to Division 10 of the Standard Specifications.

ItemSectionGeotextiles1056

Provide Type 5 geotextile for geotextile for pavement stabilization that meets the following requirements:

GEOTEXTILE FOR PAVEMENT STABILIZATION REQUIREMENTS		
Property	Requirement (MARV ^A)	Test Method
Tensile Strength @ 5% Strain (MD & CD ^A)	1,900 lb/ft	ASTM D4595
Ultimate Tensile Strength (MD & CD ^A)	4,800 lb/ft	ASTM D4595
Melting Point ^B	300° F	ASTM D276

- **A.** Machine direction (MD), cross-machine direction (CD) and MARV per Article 1056-3 of the *Standard Specifications*.
- **B.** Only required for locations with asphalt base course.

Construction Methods

Geotextile for pavement stabilization may be required at locations shown in the plans and other locations as directed. For locations with ABC or asphalt base course on chemically stabilized subgrades, use of geotextile for pavement stabilization will be based on sampling and testing for chemical stabilization. For all other locations, notify the Engineer when the embankment is completed to within 2 ft of subgrade elevation and allow 3 days for the Engineer to determine if geotextile for pavement stabilization is required.

Place geotextile for pavement stabilization as shown in the plans. Pull geotextiles taut so they are in tension and free of kinks, folds, wrinkles or creases. Install geotextile for pavement stabilization perpendicular to the survey or lane line in the MD and adjacent to each other in the CD as shown in the plans. Continuous geotextiles are required in the MD, i.e., do not splice or overlap geotextiles so seams are parallel to the survey or lane line. Completely cover stabilized subgrades or subbases with geotextile for pavement stabilization. Overlapping geotextiles in the CD is permitted but not required. Overlap geotextiles in the direction that aggregate or asphalt will be placed to prevent lifting the edge of the top geotextile. Hold geotextiles in place with wire staples or anchor pins as needed.

For asphalt base courses, asphalt mixture temperatures in the truck may not exceed 315° F at the time of placement. Do not damage geotextile for pavement stabilization when placing ABC, Class IV subgrade stabilization or asphalt base course. Place and compact ABC and asphalt base course in accordance with the contract and *Standard Specifications*. Do not operate heavy equipment on

geotextiles any more than necessary to construct base courses or subgrades. Replace any damaged geotextiles to the satisfaction of the Engineer.

Measurement and Payment

Geotextile for Pavement Stabilization will be measured and paid in square yards. Geotextiles will be measured along subgrades or subbases as the square yards of exposed geotextiles installed before placing ABC, Class IV subgrade stabilization or asphalt base course. No measurement will be made for overlapping geotextiles. The contract unit price for Geotextile for Pavement Stabilization will be full compensation for providing, transporting and installing geotextiles, wire staples and anchor pins.

Payment will be made under:

Pay ItemGeotextile for Pavement Stabilization

Pay Unit Square Yard



CLASS IV SUBGRADE STABILIZATION IN LIEU OF CHEMICAL STABILIZATION: (SPECIAL)

Description

In lieu of chemical stabilization, provide Class IV subgrade stabilization by replacing 8 inches of subgrade soils with geotextile and Class IV select material. This substitution is allowed in full typical section width and cannot result in chemically stabilized sections less than 1,000 feet in length, unless otherwise approved by the Engineer. Notify the Engineer at least 30 days in advance of starting Class IV subgrade stabilization in lieu of chemical stabilization. Define "subbase" as the portion of the roadbed below the Class IV subgrade stabilization.

Materials

Refer to Division 10 of the Standard Specifications.

Item	Section
Geotextile for Soil Stabilization, Type 4	1056
Select Material, Class IV	1016

Use Class IV select material for Class IV subgrade stabilization.

Construction Methods

Before placing geotextiles below Class IV subgrade stabilization, proof roll subbases in accordance with Section 260 of the *Standard Specifications*. For locations with geotextile for pavement stabilization, place geotextile below Class IV subgrade stabilization in accordance with the *Geotextile for Pavement Stabilization* provision. For all other locations, install geotextile for soil stabilization in accordance with Article 270-3 of the *Standard Specifications*. Place, compact and maintain Class IV subgrade stabilization in accordance with Article 505-3 of the *Standard Specifications* for a Type 2 aggregate subgrade.

Measurement and Payment

Class IV Subgrade Stabilization in Lieu of Chemical Stabilization will be paid at the prices established in the contract that relate to the chemical stabilization type that is being replaced (lime or cement). No direct payment will be made for additional excavation required to accommodate this alternate.

The total amount paid for this subgrade stabilization alternative will be limited to the contract amounts per square yard for replacement for Portland cement or lime, theoretical tons of Portland cement or lime replaced, mixing of cement or lime, and theoretical gallons of asphalt curing seal replaced at the rate of 0.15 gallons per square yard.

A supplement agreement will be executed prior to starting the work to create a square yard price for the *Class IV Subgrade Stabilization in Lieu of Chemical Stabilization* and deleting the quantities associated with the work being replaced.

Class IV Subgrade Stabilization in Lieu of Chemical Stabilization will be full compensation for Class IV subgrade stabilization and geotextile for soil stabilization. Geotextile for pavement stabilization will be measured and paid in accordance with Geotextile for Pavement Stabilization provision.



PROJECT SPECIAL PROVISIONS GEOENVIRONMENTAL

CONTAMINATED SOIL (9/20/2021)

The Contractor's attention is directed to the fact that soil contaminated with petroleum hydrocarbon compounds may exist within the project area. The potential areas of contamination are indicated on corresponding plans sheets. Information relating to these contaminated areas, sample locations, and investigation reports will be available at the following web address by navigating to the correct letting year and month then selecting, "Plans and Proposals", "Rutherford R2233BB", "Individual Sheets/520 GeoEnvironmental":

http://dotw-xfer01.dot.state.nc.us/dsplan/

Petroleum contaminated soil may be encountered during any earthwork activities on the project. The Contractor shall only excavate those soils that the Engineer designates necessary to complete a particular task. The Engineer shall determine if soil is contaminated based on areas shown on the plans, petroleum odors, and unusual soil staining. Contaminated soil not required to be excavated is to remain in place and undisturbed. Undisturbed soil shall remain in place, whether contaminated or not. The Contractor shall transport all contaminated soil excavated from the project to a facility licensed to accept contaminated soil.

In the event that a stockpile is needed, the stockpile shall be created within the property boundaries of the source material and in accordance with the Diagram for Temporary Containment and Treatment of Petroleum-Contaminated Soil per North Carolina Department of Environmental Quality's (NCDEQ) Division of Waste Management UST Section GUIDELINES FOR EX SITU PETROLEUM CONTAMINATED SOIL REMEDIATION. If the volume of contaminated material exceeds available space on site, the Contractor shall obtain a permit from the NCDEQ UST Section's Regional Office for off-site temporary storage. The Contractor shall provide copies of disposal manifests completed per the disposal facilities requirements and weigh tickets to the Engineer.

Measurement and Payment:

The quantity of contaminated soil hauled and disposed of shall be the actual number of tons of material, which has been acceptably transported and weighed with certified scales as documented by disposal manifests and weigh tickets. The quantity of contaminated soil, measured as provided above, shall be paid for at the contract unit price per ton for "Hauling and Disposal of Petroleum Contaminated Soil".

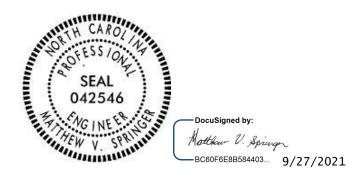
The above price and payment shall be full compensation for all work covered by this section, including, but not limited to stockpiling, loading, transportation, weighing, laboratory testing, disposal, equipment, decontamination of equipment, labor, and personal protective equipment.

Payment shall be made under:

Pay Item

Hauling and Disposal of Petroleum Contaminated Soil





DISPOSAL OF FLASHER SYSTEM

The work covered by this special provision consists of removal and disposal of a flasher system. The system includes the sign and the sign post, utility service pole, electric meter and base, circuit breaker panel and breaker(s), control devices such as relays, wire, cable, conduit, flasher units, and all other devices and equipment in the system.

All material shall be removed and disposed according to the State and Local codes, regulations, and ordinances and shall be in accordance with the Section 907 of the NCDOT Standard Specifications for Roads and Structures.

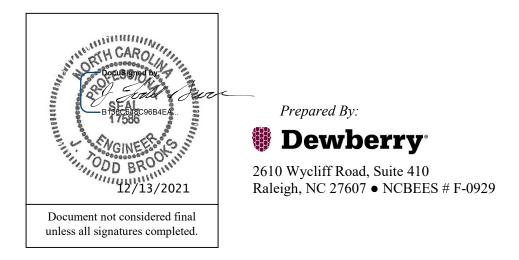
Compensation:

Disposal of a Flasher System as described above shall be paid for at the contract lump sum price for each Flasher System.

Payment will be made under:

Disposal of Flasher System Lump Sum

TIP # R-2233BB SN-02 Rutherford County



RRFB (RECTANGULAR RAPID FLASHING BEACON) SOLAR POWERED

DESCRIPTION

Furnish and install rectangular rapid flashing beacon (RRFB) that is solar powered, pedestrian activated and equipped with a crosswalk illuminator. Ensure the RRFB assembly consists of two rapidly flashing rectangular-shaped yellow indications, pushbutton, illuminator, solar panel, battery, controller assembly, wireless communications and all necessary hardware. Furnish install pedestals and pedestal foundations to support the RRFB assembly and associated signs. Ensure multiple RRFB units at a given crosswalk are synchronized. Ensure RRFB units are synchronized with corresponding advanced warning flashing beacons.

Ensure the RRFB meets the physical display and operational requirements in the interim approval for RRFB by the Federal Highway Administration; see requirements at:

https://mutcd.fhwa.dot.gov/resources/interim approval/ia21/ia21.pdf

Ensure the RRFB meets the full requirements as noted in the subsequent Official Interpretations issued by the Federal Highway Administration, which are listed on the following webpage:

https://mutcd.fhwa.dot.gov/resources/interpretations/index.htm

MATERIALS

Solar-Powered RRFB Assembly

Provide two rapid flashing yellow indications that are aligned horizontally in a single housing with a space between both indications of a minimum of 7" from inside edge of one indication to inside edge of the other indication. Ensure each indication is rectangular-shaped and has minimum dimensions of 5" wide by 2" high. Provide a Light Emitting Diode (LED) array for each indication. Provide Independent Laboratory Certification and test results for each indication facing motorists as evidence that the light intensity meets the Class 1 requirements for of the Society of Automotive Engineers (SAE) standard J595 (Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service

TIP # R-2233BB SN-03 Rutherford County

Vehicles) dated January 2005.

Provide an aluminum housing that can be attached to a 4.5" OD pedestal shaft. Powder coat the housing with an electrostatically-applied, fused- polyester paint in highway yellow (Federal Standard 595C, Color Chip Number 13538) a minimum of 2.5 to 3.5 mils thick. Ensure the housing does not project beyond the outside edges of a W11-2 sign mounted above it. Ensure the two indications are installed into the housing assembly to face in the direction of the approaching vehicular traffic. Provide two additional identical indications for the motorists in a similar constructed housing that can be attached on the opposite side of the pole (i.e., back-to-back).

Provide the two yellow indications facing motorists to flash in a rapidly alternating "wigwag" flashing sequence (left light on, then right light on). Ensure 75 periods of flashing per minute. Ensure that the left and right indications of the RRFB unit operate using the flashing sequence and illumination durations required by MUTCD Interim Approval 21 (IA-21), dated March 20, 2018, as corrected on March 21, 2018. Do not provide RRFB units programmed to flash according to the superseded MUTCD IA-11. Ensure the indications have approximately equal periods of rapid pulsing light emissions and dark operation. Ensure flash rates are not at frequencies between 5 and 30 flashes per second to avoid flash-induced seizures. Provide a flashing yellow LED indication on the end of the housing (i.e., a pilot light) to provide notification of activation and operation of the device to pedestrians in the crosswalk.

During operation, ensure the RRFB remains dark until a pedestrian actuation occurs and then returns to dark at a programmed time after the pedestrian activation. Provide RRFB units that automatically dim based upon ambient light conditions.

Ensure the system is operated by remote control radio signal and solar power. Ensure the RRFB and corresponding advance warning flashing beacons are synchronized with each other. Provide wireless communication equipment to ensure all RRFBs associated at a given crosswalk simultaneously start operation of their alternating rapid flashing indications when activated and cease operation simultaneously. Provide a means to prevent interference with other systems utilizing similar communications equipment.

Provide a 12VDC sealed gel, sealed lead acid, or absorption glass mat battery with sufficient capacity for 5 days of 3 hours of continuous operation with no additional charge from solar panel. Ensure the battery is located in a moisture and corrosion resistant enclosure. Provide a solar panel with a minimum array-to-load ratio of 1.2 and charging circuitry for the battery. Provide a solar sizing report that shows the system loss of load probability is 0% for the entire year for Rutherfordton, North Carolina. Provide mounting hardware to allow solar panel to be tilted at least 45 degrees from horizontal and panned 360 degrees.

Provide an LED floodlight/beam light combination with each RRFB assembly designed to illuminate the half of the crosswalk adjacent to the assembly concurrently with the flashing of the RRFB indications. Provide an LED floodlight/beam light unit that when paired with paired with another unit of the same manufacturer and model at opposite end of the crosswalk will provide continuous illumination of the crosswalk from one end to the other. Use TAPCO Safewalk Crosswalk Illuminator or an NCDOT-approved equivalent. Ensure the flood light illuminates the approach area of the crosswalk and the beam light illuminates the middle of the crosswalk. Ensure both the flood light and beam light activation is synchronized with the actuation of the RRFB's. Ensure that the light fades on and off upon actuation. Ensure the

TIP # R-2233BB SN-04 Rutherford County

floodlight/beam light meets or exceeds the 20 LUX minimum recommendation per the Federal Highway Administrations *Informational Report on Lighting Design for Midblock Crosswalks*.

Provide stainless steel fasteners for all items exposed to the weather. For fasteners protected from the weather, provide fasteners fabricated from stainless steel or other corrosion-resistant materials.

Ensure assemblies provide protection from environmental conditions and accidental contact equivalent to a NEMA 3R-rated enclosure. Ensure all components operate properly within the following limits unless otherwise noted:

- Humidity: 5% to 95%, non-condensing
- Ambient Temperature: -30.0°F to +165°F
- Shock NEMA TS2-2003, Section 2.1.10
- Vibration NEMA TS2-2003, Section 2.1.9

Pedestal, Base, and Foundation

Furnish Type II normal-duty pedestals that are listed on the NCDOT ITS and Signals Qualified Products List (QPL) and that comply with Article 1098-14 of the Standard Specifications except as follows:

- Provide a pedestal shaft that is 16 feet long.
- Provide a Type III pedestal foundation. Type II pedestal foundations and screw-in helical foundation anchor assemblies are prohibited.
- Furnish each pedestal with a compatible pedestal cap furnished by the manufacturer of the pedestal.

Signs

Furnish Type E signs for installation on each pedestal as shown on the Signing Plans. Provide all hardware, brackets and fasteners necessary to mount the signs securely but non-intrusively to the shaft of the Type II pedestals. Provide stainless steel fasteners and banding hardware.

Pedestrian Pushbutton

Provide a pedestrian pushbutton with each RRFB assembly to activate the flashing indications and crosswalk illuminator. Pushbutton must be listed on the NCDOT ITS and Signals Qualified Products List (QPL).

CONSTRUCTION METHODS

Install pedestal and foundation in accordance with Article 1743-3 of the *Standard Specifications*. Locate the pedestal so that the horizontal clearance from adjacent pavement edge to the near edge of the attached warning sign will be no less than 6 feet, with 12 feet preferred, unless the pedestal is positioned behind guardrail. If installed behind guardrail, position pedestal so that edge of warning sign does not protrude past the face of guardrail.

TIP # R-2233BB SN-05 Rutherford County

Locate the pedestal in so that the pedestrian pushbutton will be no more than 18 inches from the edge of the multi-use trail when installed on the pedestal shaft. Obtain the Engineer's approval of pedestal location prior to constructing the pedestal foundation.

Mount the warning signs on the pedestal shaft in accordance with the Plans using Department-approved mounting hardware and fasteners. Provide space between the W11-15P Trail Xing plaque and the W16-7P downward diagonal arrow plaque for mounting the RRFB unit.

For each approach to the RRFB location, install two RRFB assemblies at the crosswalk, one on the right-hand side of the roadway and one on the left-hand side of the roadway as shown on the Plans. Install the RRFB on the same support as the associated W11-15 (Bicycle/Pedestrian Crossing), W11-15P (TRAIL X-ING)) and W16-7P (Downward Diagonal Arrow) warning signs and plaques. Do not install an RRFB independent of the crossing warning signs.

Ensure that the outside edges of the RRFB indications, including any housings, do not project beyond the outside edges of the W11-15 sign. Locate the RRFB between the bottom of the W11-15P plaque and the top of the supplemental W16-7P plaque, rather than 12 inches above or below the sign assembly.

Install the pushbutton assembly below the RRFB and W16-7p plaque. Mount the pushbutton at a minimum height of 3.5 feet but no higher than 4.0 feet above the adjacent sidewalk/multi-use trail. Align the front face of the pedestrian pushbutton assembly parallel with the crosswalk and perpendicular to oncoming vehicular traffic. The distance from the pushbutton to the near edge of the sidewalk/multi-use trail must be no greater than 18 inches. Mount a "PUSH BUTTON TO TURN ON WARNING LIGHTS" (R10-25) sign adjacent to or integral with each pedestrian pushbutton.

Obtain flashing duration to be programmed into the RRFB from the Engineer.

Install the floodlight/ beam light combination unit on the pedestal in accordance with the manufacturer's instructions to illuminate the crosswalk when the RRFB is actuated.

WARRANTY

Provide in writing a minimum of one-year warranty from the date of the RRFB system installation for all system components. Provide a prorated five-year warranty for the battery. Warrant the solar panel for 20 years. All shipping cost for warranty repairs shall be paid by the vendor.

MEASUREMENT AND PAYMENT

RRFB Assembly will be measured and paid as the actual number of RRFB assemblies furnished, installed, and accepted.

No measurement will be made of rapidly flashing rectangular-shaped yellow indications, crosswalk illuminator, solar panel, battery, controller assembly, pedestals, pedestal foundations, all necessary hardware, programming and testing, and warrantees as these items will be considered incidental to furnishing and installing RRFB assemblies.

Installation of Department-furnished warning signs and pushbutton signs will be measured and paid for in accordance with Article 904-4 of the *Standard Specifications*.

TIP # R-2233BB SN-06 Rutherford County

Payment will be made under:

Pay Item Pay Unit

RRFB Assembly Each

ADVANCE WARNING FLASHING BEACONS

DESCRIPTION

Furnish and install advance warning flashing beacons that are solar powered to supplement bicycle/pedestrian crossing warning signs installed in advance of trail crossings with RRFBs. Provide advance warning flashing beacons that operate concurrently with corresponding downstream RRFBs when actuated and which communicate wirelessly with the RRFBs. Furnish install pedestals and pedestal foundations to support the beacons and associated signs.

MATERIALS

Furnish advance warning flashing beacon assemblies that consist of a pair of 12-inch signal head sections, solar panel, battery, controller assembly, wireless communications and all necessary cabling and mounting hardware. Provide advance warning flashing beacons that comply with MUTCD Chapter 4L.

Provide 12-inch circular yellow signal LED signal modules that comply with "Signal Heads" section of the Signals and Intelligent Transportation Systems Project Special Provisions and that are listed on the ITS and Signals QPL. Provide two separate, single-section aluminum signal heads with aluminum visors. Paint the signal housing and the exterior of the visor yellow and paint the interior of the visor black in accordance with "Signal Heads" section of the Signals and Intelligent Transportation Systems Project Special Provisions.

Provide the two circular yellow indications arranged vertically facing motorists to flash in a alternating "wig-wag" flashing sequence (top light on, then bottom light on). Provide flashing rate and illuminated periods that comply with MUTCD Section 4L.01.

Provide side of pole mounting assemblies with framework and all other hardware necessary to make complete, watertight connections of the signal heads to the pedestals. Fabricate the mounting assemblies and frames from aluminum with all necessary hardware, screws, washers, etc. to be stainless steel. Provide mounting fittings that match the positive locking device on the signal head with the serrations integrally cast into the brackets. Provide upper and lower pole plates that have a 1 ¼-inch vertical conduit entrance hubs with the hubs capped on the lower plate and 1½-inch horizontal hubs. Ensure that the assemblies provide rigid attachments to pedestals so as to allow no twisting or swaying of the signal heads. Ensure that all raceways are free of sharp edges and protrusions, and can accommodate signal conductors.

During operation, ensure the beacons remain dark until a pedestrian actuation occurs at the corresponding downstream RRFB and then returns to dark at a programmed time after the pedestrian activation. Ensure the system is operated by remote control radio signal and solar power. Ensure the advanced warning flashing beacons and corresponding RRFB are synchronized with each other and flash concurrently. Provide wireless communication

TIP # R-2233BB

equipment to ensure all advance warning flashing beacons and RRFBs associated at a given crosswalk simultaneously start operation of their flashing indications when activated by pedestrian pushbutton actuation and cease operation simultaneously. Provide a means to prevent interference with other systems utilizing similar communications equipment.

Provide a 12VDC sealed gel, sealed lead acid, or absorption glass mat battery with sufficient capacity for 5 days of 3 hours of continuous operation with no additional charge from solar panel. Ensure the battery is located in a moisture and corrosion resistant enclosure. Provide a solar panel with a minimum array-to-load ratio of 1.2 and charging circuitry for the battery. Provide a solar sizing report that shows the system loss of load probability is 0% for the entire year for Rutherfordton, North Carolina. Provide mounting hardware to allow solar panel to be tilted at least 45 degrees from horizontal and panned 360 degrees.

Provide stainless steel fasteners for all items exposed to the weather. For fasteners protected from the weather, provide fasteners fabricated from stainless steel or other corrosion-resistant materials.

Ensure assemblies provide protection from environmental conditions and accidental contact equivalent to a NEMA 3R-rated enclosure. Ensure all components operate properly within the following limits unless otherwise noted:

- Humidity: 5% to 95%, non-condensing
- Ambient Temperature: -30.0°F to +165°F
- Shock NEMA TS2-2003, Section 2.1.10
- Vibration NEMA TS2-2003, Section 2.1.9

Pedestal, Base, and Foundation

Furnish Type II normal-duty pedestals that are listed on the NCDOT ITS and Signals Qualified Products List (QPL) and that comply with Article 1098-14 of the *Standard Specifications* except as follows:

- Provide a pedestal shaft that is 16 feet long.
- Provide a Type III pedestal foundation. Type II pedestal foundations and screw-in helical foundation anchor assemblies are prohibited.
- Furnish each pedestal with a compatible pedestal cap furnished by the manufacturer of the pedestal.

Signage

Furnish Type E signs for installation on each pedestal as shown on the Signing Plans. Provide all hardware, brackets and fasteners necessary to mount the signs securely but non-intrusively to the shaft of the Type II pedestals. Provide stainless steel fasteners and banding hardware.

TIP # R-2233BB SN-08 Rutherford County

CONSTRUCTION METHODS

Install pedestal and foundation in accordance with Article 1743-3 of the *Standard Specifications*. Locate the pedestal so that the horizontal clearance from adjacent pavement edge to the near edge of the attached warning sign will be no less than 6 feet, with 12 feet preferred, unless the pedestal is positioned behind guardrail. If installed behind guardrail, position pedestal so that edge of warning sign does not protrude past the face of guardrail. Obtain the Engineer's approval of pedestal location prior to constructing the pedestal foundation.

Mount the warning signs on the pedestal shaft in accordance with the Plans using Department-approved mounting hardware and fasteners. Provide space between the W11-15 Bicycle/Pedestrian warning sign and the W11-15P Trail Xing plaque for mounting the bottom flashing beacon.

Install the flashing beacon assembly on the same support as the associated W11-15 (Bicycle/Pedestrian Crossing), W11-15P (TRAIL X-ING)) and W16-9P (AHEAD) warning signs and plaques. Mount the flashing beacons 12 inches above and below the W11-15 sign. Provide 12 inches between the bottom beacon and the W11-15P sign.

The flashing duration to be programmed to match the duration programmed into the RRFB from the Engineer.

WARRANTY

Provide in writing a minimum of one-year warranty from the date of the system installation for all system components. Provide a prorated five-year warranty for the battery. Warrant the solar panel for 20 years. All shipping cost for warranty repairs shall be paid by the vendor.

MEASUREMENT AND PAYMENT

Advance Warning Flashing Beacon Assembly will be measured and paid as the actual number of advance warning beacon assemblies furnished, installed, and accepted.

No measurement will be made of signal heads, solar panel, battery, controller assembly, pedestal, pedestal foundation, all necessary hardware, programming and testing, and warrantees as these items will be considered incidental to furnishing and installing advance warning flashing beacon assemblies.

Installation of Department-furnished warning signs and pushbutton signs will be measured and paid for in accordance with Article 904-4 of the *Standard Specifications*.

Payment will be made under:

Pay Item Pay Unit

Advance Warning Flashing Beacon Assembly Each



POLYUREA PAVEMENT MARKING MEDIA AND THICKNESS:

(08-27-20)

Amend the NCDOT 2018 Standard Specifications as follows:

Page 12-8, Subarticle 1205-5(B), lines 14-16, replace with the following:

Produce polyurea pavement marking lines that have a minimum dry thickness of 20 mils above the pavement surface when placed on concrete and asphalt pavements. Produce polyurea pavement marking lines that have a minimum dry thickness of 30 mils above the pavement surface on textured surfaces such as OGFC and on surfaces where the polyurea will be placed over a previously removed pavement marking.

Page 12-9, replace Table 1205-4 Minimum Reflectometer Requirement for Polyurea with the following:

TABLE 1205-4 MINIMUM REFLECTOMETER REQUIREMENTS FOR POLYUREA		
Item	Color	Reflectivity
Standard Glass Beads	White	375 mcd/lux/m ²
	Yellow	250 mcd/lux/m ²

The installer may choose to use an AASHTO Type 4/Type 1 or AASHTO Type 3/Type 1 double drop system, but no price adjustment will be made, and these systems will be incidental to the polyurea pavement marking.

Pay Item	Pay Unit
Polyurea Pavement Marking Lines,",mils	Linear Foot
(Standard Glass Beads)	

R-2233BB Rutherford County

WORK ZONE TRAFFIC CONTROL Project Special Provisions Table of Contents

Special Provision	Page
Traffic Control Devices to Remain on Project	TC-2
ADA Compliant Pedestrian Traffic Control Devices	TC-2
Sequential Flashing Warning Lights	TC-3



R-2233BB Rutherford County

TRAFFIC CONTROL DEVICES TO REMAIN ON PROJECT:

(02/05/2013)

Description

Furnish, install, maintain during the life of the project, and leave Traffic Control Devices on the project at its completion in accordance with the plans and specifications.

Construction Methods

Install and leave on the project the Traffic Control Devices necessary to accommodate the traffic pattern shown on sheets <u>PMP-5 thru PMP-8</u>, <u>PMP-25 thru PMP-26</u> of the Final Pavement Marking Plan and sheets <u>SIGN-5L</u>, <u>SIGN-5O</u>, <u>and SIGN-5Q</u> of the Proposed Signing Plan, unless otherwise directed by the Engineer.

Provide devices to remain on the project, which meet the requirements of their respective specifications in the 2018 Standard Specifications or their respective special provisions.

Provide devices to remain on the project that are in good condition and subject to the approval of the Engineer.

The devices required to remain on the project at its completion will become the property of the Department.

Basis of Payment

No additional payment will be made specifically for leaving devices on the project. These devices will be paid under their respective pay items in the Contract which will include full compensation for furnishing, installing, maintaining during the life of the project, and leaving the devices on the project at its completion.

ADA COMPLIANT PEDESTRIAN TRAFFIC CONTROL DEVICES:

(10/31/2017)

Description

Furnish, install, and maintain all ADA compliant pedestrian traffic control devices for existing sidewalks that are disrupted, closed, or relocated by planned work activities.

The ADA compliant pedestrian traffic control devices used to either close, redirect, divert or detour pedestrian traffic are Pedestrian Channelizing Devices.

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Construction Methods

The ADA compliant pedestrian traffic control devices involved in the closing or redirecting of pedestrians as designated on the Transportation Management Plan (TMP) shall be manufactured and assembled in accordance with the requirements of the Americans with Disabilities Act (ADA) and be on the NCDOT approved products list.

Pedestrian Channelizing Devices shall be manufactured and assembled to be connected as to eliminate any gaps that allow pedestrians to stray from the channelizing path. Any Pedestrian Channelizing Devices used to close or block a sidewalk shall have a "SIDEWALK CLOSED" sign affixed to it and any audible warning devices, if designated on the TMP.

Measurement and Payment

The measurement and payment for the Pedestrian Channelizing Devices will be by the linear foot.

Payment for each of these devices is dependent upon satisfactory installation and acceptance by the Engineer. The unit prices include any costs associated with installation, maintenance and removal of the devices from the project.

Payment will be made under:

Pay Item Pay Unit

Pedestrian Channelizing Devices......Linear Foot

SEQUENTIAL FLASHING WARNING LIGHTS:

(10/08/2016)

Description

Furnish and install Sequential Flashing Warning Lights on drums used for merging tapers during nightly work activities.

The purpose of these lights is to assist the motorist in determining which direction to merge when approaching a lane closure. It's also designed to reduce the number of late merges resulting in devices being struck and having to be reset to maintain positive guidance at the merge point. The successive flashing of the lights shall occur from the upstream end of the merging taper to the downstream end of the merging taper in order to identify the desired vehicle path.

Materials

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The Sequential Flashing Warning Lights shall meet all of the requirements for warning lights within the current edition of the Manual of Uniform Traffic Control Devices (MUTCD).

Each light unit shall be capable of operating fully and continuously for a minimum of 200 hours when equipped with a standard battery set.

Each light in the sequence shall be flashed at a rate of not less than 55 times per minute and not more than 75 times per minute. The flash rate and flash duration shall be consistent throughout the sequence.

Supply a Type 3 Certification (Independent Test Lab results) documenting all actual test results for the specified parameters contained in the Institute of Transportation Engineer's (ITE's) *Purchase Specification for Flashing and Steady Burn Warning Lights*. The laboratory shall also identify all manufacturer codes and part numbers for the incandescent lamp or LED clusters, lenses, battery, and circuitry, and the total width of the light with the battery in place. The complete assembly shall be certified as crashworthy when firmly affixed to the channelizing device.

All Sequential Flashing Warning Lights shall be on the NCDOT Work Zone Traffic Control Approved Products List.

Construction Methods

Sequential Flashing Warning Lights are to be used for night time lane closures.

These lights shall flash sequentially beginning with the first light and continuing until the final light.

The Sequential Flashing Warning Lights shall automatically flash in sequence when placed on the drums that form the merging taper.

The number of lights used in the drum taper shall equal the number of drums used in the taper.

Drums are the only channelizing device allowed to mount sequential flashing warning lights.

The Sequential Flashing Warning Lights shall be weather independent and visual obstructions shall not interfere with the operation of the lights.

The Sequential Flashing Warning Lights shall automatically sequence when placed in line in an open area with a distance between lights of 10 to 100 feet. A 10 foot stagger in the line of lights shall have no adverse effect on the operation of the lights.

If one light fails, the flashing sequence shall continue. If more than 1 light fails, all of the lights are to be automatically turned to the "off" mode. Non-sequential flashing is prohibited.

When lane closures are not in effect, the Sequential Flashing Warning Lights shall be deactivated.

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Measurement and Payment

Sequential Flashing Warning Lights will be measured and paid as the maximum number of sequential flashing warning lights satisfactorily installed and properly functioning at any one time during the life of the project.

This includes all materials and labor to install, maintain and remove all the Sequential Flashing Warning Lights.

Pay ItemPay UnitSequential Flashing Warning LightsEach

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UC-1

County: Rutherford

PROJECT SPECIAL PROVISIONS

Utility Construction

EXHIBIT C



169 Oak Street • Forest City, NC 28043 office 828. 247.4495 • fax 828.247.4498

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

The proposed utility construction shall meet the applicable requirements of the NC Department of Transportation "Standard Specifications for Roads and Structures" dated January 2018.

Contractor shall meet the installation standards of the AWWA or ASTM for utility construction.

All proposed utility construction shall meet the applicable requirements (including, but not limited to: Division 15; Section 1034; and Section 1036) of the NC Department of Transportation's "Standard Specifications for Roads and Structures" dated January 2018.

Revise the 2018 Standard Specifications as follows:

Page 15-1, Sub-article 1500-2 Cooperation with the Utility Owner, paragraph 2: add the following sentences:

The water utility owner is the Broad River Water Authority. The contact person is Maria Hunnicutt and she can be reached by phone at 828-286-0640. The sewer utility owner is the Town of Rutherfordton. The contact person is Doug Barrick and he can be reached by phone at 828-287-3520.

Any work on these utility lines, especially the operation of any valves, must be coordinated through the Engineer and the utility owner before initiating said work.

Owner and Owner's Requirements:

The contractor shall provide access for the owner's representatives to all phases of construction. The owner shall also be notified two (2) weeks prior to commencement of any work and one (1) week prior to service interruption. Interruption of water service on main lines shall be limited to a maximum of 4 hours during regular working hours unless approved otherwise by Broad River Water Authority.

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It shall be the Contractor's responsibility to notify customers affected by necessary shut downs of the existing water system at least 24 hours in advance.

Only Broad River Water Authority personnel shall operate valves and hydrants except in the case of an emergency. Notify Broad River Water Authority immediately of an emergency requiring valve or hydrant operation.

All removed water meters and fire hydrants shall be stockpiled by the Contractor in one area accessible for the owner to pick up.

Any cracked, damaged, or defective pipe, fittings, or other attachments discovered as a result of the pressure test, shall be removed and replaced with sound material. The tests shall be repeated until test results are satisfactory.

Page 15-2, Paragraph 3 of Article 1500-7

Provide As-Built plans of the installed utility. The plans shall include notations of the size and type of material installed, coordinates of utility controls, and horizontal and vertical locations of the piping. Provide 2 copies to the Utility Owner and 2 copies to the Engineer. Provide the Utility Owner with 2 copies of surveyed As-Builts of the utility system constructed.

Division 10 of the Standard Specifications is revised as follows:

Page 10-57, Paragraph 1 of Article 1034-2 Plastic Pipe, (A) PVC Gravity Flow Sewer Pipe

Contractor shall use PVC pipe with a minimum SDR of 35 for all gravity sanitary sewer owned by the Town of Rutherfordton.

Page 10-57, Article 1034-2 Plastic Pipe, (B) PVC Force Main Sewer Pipe

(1) Pressure Rated Pipe

Contractor shall use PVC pipe with a minimum SDR of 21 for all force main sanitary sewer owned by Town of Rutherfordton.

Page 10-58, Article 1036-3 Plastic Pipe, (A) PVC Pipe

(1) Pressure Rated Pipe

Contractor shall use PVC pipe with a minimum SDR of 21 for all water line owned by Broad River Water Authority

(2) Pressure Class Pipe

Contractor shall use DIP CL 350 pipe with a minimum DR of 18 for all water line owned by the Broad River Water Authority.

Page 10-58, Article 1036-5 Ductile Iron Pipe and Fittings

Contractor shall use Ductile Iron Pipe with an integrated restrained joint system for all water line to be installed within steel encasement pipe that is owned by the Broad River Water Authority

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and for sewer line and force main to be within steel encasement pipe that is owned by Town of Rutherfordton.

Revise the NCDOT 2018 "Standard Specifications for Roads and Structures" as follows:

Page 15-6, Subarticle 1510-3 (A) Construction Requirements:

Follow the allowable leakage formula from the most current versions of A WW A C600 (for ductile iron pipe) or AWWA C605 (for PVC pipe). The allowable leakage formula 1s:

 $W=LD(P)\frac{1}{2}/148,000$

For disinfection, use the "Continuous-Feed Method" as described in the most current version of A WW A C651, Section 4.4.3 and as directed in NCDEQ "The Rules of Governing Public Water Systems", Section .1003. This method requires a solution of at least 50 ppm chlorine to be introduced into the new pipeline and held for at least 24 hours. During this time, the residual concentration of chlorine shall remain at least 10 ppm. If the chlorine concentration drops below 10 ppm, the test shall be repeated. Collected samples shall be analyzed at a state approved laboratory and the result provided to the utility owner.

The testing, cleaning and sterilization shall be performed consecutively.

Utility Locations Shown on the Plans:

The locations, sizes, and type material of the existing utilities shown on the plans are from the best available information. The contractor will be responsible for determining the exact location, size, and type of material of the existing facilities necessary for the construction of the proposed utilities and to avoid damage to existing facilities. All water and sanitary sewer services disturbed during construction shall be reconnected, even if not shown on the plans. Contractor is to make the Engineer aware of any plan discrepancies.

Water line location in relation to sewers shall conform to NCDOT's 2018 "Standard Specifications for Roads and Structures" Section 1500-5 and NCDEQ's "The Rules of Governing Public Water Systems" Section .0906.

Open Cut Installation:

All water line construction performed using open cut installation within or adjacent to traffic shall have the final approved traffic control measures in place prior to beginning any open cut installation.

Material Specifications:

When brand names of materials have been determined, the Contractor shall obtain approval, through the engineer and the owner prior to their use and/or installation.

Then Contractor shall furnish, but is not limited to furnishing, catalog cuts and/or shop drawings of the materials. Thirty days shall be allowed for the Engineer's review of each submittal. Eight copies of each catalog cut and/or shop drawing (signed and sealed) shall be submitted.

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Compensation:

No direct payment will be made for utility construction work required by the preceding provisions which are general requirements applying to utility construction, and all of the requirements stated will be considered incidental work, paid for at the previously agreed upon lump sum price.

Relocation of Water Meter:

Construction shall relocate the existing water meter by cutting and plugging the existing line and relocating the water meter by tapping and connecting to new line.

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PROJECT SPECIAL PROVISIONS Utilities by Others



County: Rutherford

General:

The following utility companies have facilities that will be in conflict with the construction of this project:

- A) Duke Energy Power (Transmission)
- B) Duke Energy Power (Distribution)
- C) Dominion Energy Gas (PSNC Gas)
- D) AT&T- Communications
- E) Pangaea Internet Communications
- F) Northland Communications—Communications

The conflicting facilities of these concerns will be adjusted prior to the date of availability, unless otherwise noted and are therefore listed in these special provisions for the benefit of the Contractor. All utility work listed herein will be done by the utility owners. All utilities are shown on the plans from the best available information.

The Contractor's attention is directed to Article 105.8 of the Standard Specifications.

Utilities Requiring Adjustment:

Utility relocations are shown on the Utilities by Others Plans.

Please note this project is divided into eight (8) phases based on constructability and circuit design by Duke Energy Dist. Each utilities completion is identified as "by the Date of Availability", an actual date their relocation will be completed or No Relocation in this phase.

Phases and UO sheets in each are as follows:

Phase 1	UO-9 West of L3, UO-25
Phase 2	UO-9 East of L3, UO-26
Phase 3	UO-10,UO-27,UO-28
Phase 4	UO-10,UO-11,UO-12,UO-13,UO-14,UO-29,UO-29A
Phase 5	UO-14,UO-15,UO-16,UO-17,UO-30
Phase 6	UO-18,UO-19,UO-20
Phase 7	UO-2A,UO-2,UO-3,UO-4,UO-21, UO-22
Phase 8	UO-5,UO-6,UO-7,UO-8,UO-23,UO-24

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Project: R-2233BB UbO-2 County: Rutherford

PROJECT SPECIAL PROVISIONS

Utilities by Others

Contacts:

Duke Energy – Power (Transmission) is Mr. Rob Johnston at 803-835-7949 <u>rjohnston@pike.com</u>

Duke Energy – Power (Distribution) is Mr. Bobby Holland at 803-300-1192 bobby.holland@duke-energy.com

Dominion Energy – Gas (PSNC Gas) is Mr. Mike Lewis at 828-670-3550 william.lewis@scana.com

AT&T—Communications is Mr. Danny Little at 704-254-4289 dflittle@carolina.rr.com

Pangaea Internet – Communications is Mr. Ken Griffin at 828-859-3072 ken@e-polk.org

Northland – Communications is Mr. David Scott at 864-321-0815 david.scott@vyvebb.com

Phase 1:

- Duke Energy (Transmission)
 - 1) Duke Energy will install new aerial lines within their existing easement on UO- 9 in the area of RPA Sta. 20+29 continuing to L3 Sta.860+50 and tie into phase 3 by October 20, 2022
 - 2) Duke Energy will install new Transmission poles and aerial lines within a new easement from the Substation on UO-9 continuing South on UO-25 crossing Y3 Sta. 17+25 to tie into Phase 3 by October 20, 2022
- Duke Energy (Distribution) will install new utility poles, aerial lines and underground cables within the phase 1 limits by the Date of Availability
- Dominion Energy Gas (PSNC Gas) has No Relocation in this phase
- AT&T will install aerial cables on Duke Energy's new poles within the phase 1 limits by June 10, 2022
 - 1) AT&T will install underground cables to tie their new facilities to existing facilities in phase 1 by June 10, 2022
- Pangaea Internet will install aerial cables on Duke Energy's new poles within the phase 1 limits by the Date of Availability
- Northland Communications has No Relocation in this phase

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Project: R-2233BB UbO-3 County: Rutherford

PROJECT SPECIAL PROVISIONS

Utilities by Others

Phase 2:

- Duke Energy (Transmission) has No Relocation in this phase
- Duke Energy (Distribution) will install new utility poles, aerial lines and underground cables within the phase 2 limits by the Date of Availability
- Dominion Energy Gas (PSNC Gas) has No Relocation in this phase
- AT&T will install aerial cables on Duke Energy's new poles within the phase 2 limits by June 10, 2022
 - 1) AT&T will install underground cables to tie their new facilities to existing facilities phase 2 by June 10, 2022
- Pangaea Internet will install aerial cables on Duke Energy's new poles within the phase 2 limits by the Date of Availability
- Northland Communications will install aerial cables on Duke Energy's new poles within the phase 2 limits by the Date of Availability

Phase 3:

- Duke Energy (Transmission)
 - 1) Duke Energy will install new Transmission poles and aerial lines by the Date of Availability
 - 2) Duke Energy (Distribution) will install new utility poles, aerial lines and underground cables within the phase 3 limits by the Date of Availability
- Dominion Energy Gas (PSNC Gas) has No Relocation in this phase
- AT&T will install aerial cables on Duke Energy's new poles within the phase 3 limits by March 11, 2022
- Pangaea Internet will install aerial cables on Duke Energy's new poles within the phase 3 limits by the Date of Availability
- Northland Communications will install aerial cables on Duke Energy's new poles within the phase 3 limits by the Date of Availability

Phase 4:

- Duke Energy (Transmission) has No Relocation in this phase
- Duke Energy (Distribution) will install new utility poles, aerial lines and underground cables within the phase 4 limits by the Date of Availability
- Dominion Energy Gas (PSNC Gas) has No Relocation in this phase
- AT&T will install aerial cables on Duke Energy's new poles within the phase 4 limits by August 5, 2022
 - 1) AT&T will place new underground cables on the West side of Y8 from Sta. 26+04 through the end of the construction limits on Y8 by August 5, 2022
- Pangaea Internet will install aerial cables on Duke Energy's new poles within the phase 4 limits by the Date of Availability
- Northland Communications will install aerial cables on Duke Energy's new poles within the phase 4 limits by the Date of Availability

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Project: R-2233BB UbO-4 County: Rutherford

PROJECT SPECIAL PROVISIONS

Utilities by Others

Phase 5:

- Duke Energy (Transmission) has No Relocation in this phase
- Duke Energy (Distribution) will install new utility poles and aerial lines within the phase 5 limits by the Date of Availability
- Dominion Energy Gas (PSNC Gas) has No Relocation in this phase
- AT&T will install aerial cables on Duke Energy's new poles within the phase 5 limits by December 31, 2022
 - 1) AT&T will place new underground cables on the West side of existing US 221 from L3 Sta. 925+00 to the new AT&T site at the High School Sta. L3 937+00 and continuing to L3 Sta. 958+70 by December 31, 2022
 - 2) AT&T will install aerial cables on existing AT&T poles on the East side of Gilboa Church Rd Sta. L3 958+60 to 965+00 by December 31, 2022
 - 3) AT&T to place new underground cables on the North side of Broyhill Rd. Y11 25+30 to Sta. 27.90 by December 31, 2022
- Pangaea Internet will install aerial cables on Duke Energy's new poles within the phase 5 limits by February 18, 2022
 - 1) Pangaea to place new underground cables on the East side of Old US 221 between L3 Sta. 932+90 to Sta. 936.80 and continuing SE away from the phase 5 limits by February 18, 2022
- Northland Communications will install aerial cables on Duke Energy's new poles within the phase 5 limits by March 25, 2022

Phase 6:

- Duke Energy (Transmission) has No Relocation in this phase
- Duke Energy (Distribution) will install new utility poles, aerial lines and underground cables within the phase 6 limits by the Date of Availability
- Dominion Energy Gas (PSNC Gas) has No Relocation in this phase
- AT&T will install aerial cables on existing AT&T poles on the East side of US 221 Sta. L3 973+00 to 991+50 by April 29, 2022
 - 1) AT&T will install aerial cables on Duke Energy's new poles within the phase 6 limits by April 29, 2022
- Pangaea Internet will install aerial cables on Duke Energy's new poles within the phase 6 limits by February 3, 2022
- Northland Communications will install aerial cables on Duke Energy's new poles within the phase 6 limits by February 24, 2022

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Project: R-2233BB UbO-5 County: Rutherford

PROJECT SPECIAL PROVISIONS

Utilities by Others

Phase 7:

- Duke Energy (Transmission) has No Relocation in this phase
- Duke Energy (Distribution) will install new utility poles, aerial lines and underground cables within the phase 7 limits by March 4, 2022
- Dominion Energy Gas (PSNC Gas) will install a new 4" line within the phase 7 limits which will require 4.5 months to construct after the below provisions are addressed. Dominion requires three weeks notice to mobilize and begin their const. within each areas listed below
 - 1) Dominion requires the grading for L3 in the area of L3 Sta.776+00 on UO-4 be completed by the construction contractor prior to the installation of the gas line
 - 2) Dominion requesting the proposed drainage on the South side of Charlotte Rd. between Executive Dr. and Y2 Sta. 16+69 on UO-21 be delayed until Dominion completes the installation of their new gas line
 - 3) Dominion requires the grading for Y2 in the area of Y2 Sta.38+50 on UO-22 be completed by the construction contractor prior to the installation of the gas line
- AT&T will install aerial cables on Duke Energy's new poles within the phase 7 limits by October 24, 2022
- Pangaea Internet will install aerial cables on Duke Energy's new poles within the phase 7 limits by April 8, 2022
- Northland Communications has No Relocation in this phase

Phase 8:

- Duke Energy (Transmission)
 - 1) Duke Energy will install new Transmission poles and aerial lines within their existing easement on UO-5 in the area of L3 Sta.793+75 by the Date of Availability
 - 2) Duke Energy will install new Transmission poles and aerial lines within their existing easement on UO-7 in the area of L3 Sta.819+30 along with new Transmission poles and aerial lines within a new easement on UO-7 & UO-8 North to tie into their existing easement in the area of L3 Sta. 825+00 by October 20, 2022
 - 3) Duke Energy will install new Transmission poles and aerial lines on UO-23 to replace existing structures within the phase 8 limits by October 20, 2022
- Duke Energy (Distribution) will install new utility poles, aerial lines and underground cables within the phase 8 limits by March 4, 2022

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Project: R-2233BB UbO-6 County: Rutherford

PROJECT SPECIAL PROVISIONS Utilities by Others

Phase 8 continued

- Dominion Energy Gas (PSNC Gas) will install a new 4" line within the phase 8 limits which will require 5.5 months to construct after the below provisions are addressed. Dominion requires three weeks notice to mobilize and begin their const. within each areas listed below
 - 1) Dominion will not be able to abandon any facilities within phase 8 until all new lines are installed and pressurized on Green St. and Charlotte Rd.
 - 2) Dominion requires the grading for L3 in the area of L3 Sta.813+65 on UO-7 be completed by the construction contractor prior to the installation of the gas line
- AT&T will install aerial cables on Duke Energy's new poles within the phase 8 limits by November 10, 2022
- Pangaea Internet will install aerial cables on Duke Energy's new poles within the phase 8 limits by April 1, 2022
- Northland Communications will install aerial cables on Duke Energy's new poles within the phase 8 limits by May 2, 2022

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PROJECT SPECIAL PROVISIONS <u>Utility Special</u>



Utility Coordinator

Description:

The contractor shall provide a Utility Coordinator to coordinate the physical utility relocations and the protection of utility facilities with the highway project construction. The Coordinator shall facilitate and provide construction oversight through completion of the utility relocations with the highway project construction to resolve all utility conflicts, expedite the project schedule and to maintain the safety of the workers and roadway users. The Coordinator shall promote communications between parties, i.e. the Contractor's personnel, the utility owners' personnel and contractors, and the Department's personnel.

The Utilities by Others (UbO) plans and special provisions detail the utility relocations to be performed by others, and the Utility Construction (UC) plans and special provisions detail the utility relocations to be constructed under this contract. The Utility Coordinator is responsible for oversight and fulfillment of this provision in regard to all utilities detailed in the UbO plans, UC plans, and corresponding special provisions. In accordance with 105-8, the Department has coordinated the design and construction of the relocations up to the date of the UO Special Provisions.

Tasks include:

- Facilitate the exchange of information on the status of the work, the upcoming plans, and the needs of the parties.
- Maintain a schedule of activities and of relationships between the parties.
- Document the status and events as they occur and the effect of events upon the parties, reporting weekly to the Engineer.
- Participate in monthly status meeting per the Project Management Plan.
- Provide decision makers of the parties with information to assure that timely decisions are made, and actions are taken.
- Inspect daily operations and coordinating utility relocations with project construction.

- Ensure compliance with the "Underground Utility Safety and Damage Prevention Act" for damage prevention.
- Review Utility Owners' plans for conflict resolution and constructability
- Ensure utilities are located (vertically and horizontally) per plans or plans as modified to ensure conflicts with construction are resolved.
- Communicate closely with Division 13 Utility Engineer and the Construction Management Team.
- Coordinate conflict resolution with construction activities.
- Arrange for the provision of surveying information as needed to assist with utility relocations.
- Identify and coordinating field adjustments necessary due to site conditions and construction operations.
- Ensure that all Traffic Control and Erosion Control requirements are adhered to by the Utility Owners and their Agents.

Recommended Methods for accomplishing the tasks include:

- Provide facilities for meetings.
- Conduct meetings as required and/or recommended by the Engineer.
- Provide schedules and documents to all parties, as recommended by the Engineer.
- Provide minutes of meetings to all parties within 1 week of meeting.
- Obtain and update NC811 Notices for damage prevention.
- Inspect for maintenance of utility location markings on the ground.
- Coordinate the traffic controls of the Contractor and Utility Owners.
- Be a clearinghouse for utility related information exchange.

Submittals:

Provide monthly reports at the monthly status meeting to the Construction Management Team detailing:

- Utility relocation activities completed for the month separated by utility owner.
- Utility relocation activities planned for the next month separated by utility owner.
- An overall assessment of utility relocation progress and the effect on the highway project.
- Critical needs and recommended actions to maintain the contract schedule.
- Establish and provide a clearly defined timeline for utility relocations to occur which identifies the critical path.

Measurement and Payment:

The work of this provision will be paid for at the contract lump sum price for "Utility Coordinator." Partial payments will be made on each particular payment estimate based upon the percentage complete of the utility relocations. The Contractor shall submit a certified statement each month indicating the percentage of work completed. The Resident

Engineer will determine if the amount indicated is reasonably correct and the Resident Engineer will pay accordingly on the next partial pay estimate.

Payment will be made under:	
Utility Coordinator:	Lump Sum

Project Special Provisions Erosion Control

STABILIZATION REQUIREMENTS:

(4-30-2019)

Stabilization for this project shall comply with the time frame guidelines as specified by the NCG-010000 general construction permit effective April 1, 2019 issued by the North Carolina Department of Environmental Quality Division of Water Resources. Temporary or permanent ground cover stabilization shall occur within 7 calendar days from the last land-disturbing activity, with the following exceptions in which temporary or permanent ground cover shall be provided in 14 calendar days from the last land-disturbing activity:

- Slopes between 2:1 and 3:1, with a slope length of 10 ft. or less
- Slopes 3:1 or flatter, with a slope of length of 50 ft. or less
- Slopes 4:1 or flatter

The stabilization timeframe for High Quality Water (HQW) Zones shall be 7 calendar days with no exceptions for slope grades or lengths. High Quality Water Zones (HQW) Zones are defined by North Carolina Administrative Code 15A NCAC 04A.0105 (25). Temporary and permanent ground cover stabilization shall be achieved in accordance with the provisions in this contract and as directed.

SEEDING AND MULCHING:

(WestEd)

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

Shoulder and Median Areas

August 1 - June 1		May 1 - September 1	
20#	Kentucky Bluegrass	20#	Kentucky Bluegrass
75#	Hard Fescue	75#	Hard Fescue
25#	Rye Grain	10#	German or Browntop Millet
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Areas Beyond the Mowing Pattern, Waste and Borrow Areas:

August 1 - June 1		May 1 - September 1	
100#	Tall Fescue	100#	Tall Fescue
15#	Kentucky Bluegrass	15#	Kentucky Bluegrass
30#	Hard Fescue	30#	Hard Fescue
25#	Rye Grain	10#	German or Browntop Millet
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Approved Tall Fescue Cultivars

06 Dust Escalade Justice Serengeti 2nd Millennium Essential Kalahari Shelby 3rd Millennium Evergreen 2 Kitty Hawk 2000 Sheridan Apache III Falcon IV Legitimate Signia Silver Hawk Avenger Falcon NG Lexington Barlexas Falcon V **LSD** Sliverstar Barlexas II Faith Magellan Shenandoah Elite Bar Fa Matador Sidewinder Fat Cat Barrera Millennium SRP Skyline Festnova Solara Barrington **Fidelity** Monet Barrobusto Finelawn Elite Mustang 4 Southern Choice II Barvado Finelawn Xpress Ninja 2 Speedway Ol' Glory Spyder LS **Biltmore** Finesse II **Bingo** Firebird Olympic Gold Sunset Gold Padre Bizem Firecracker LS Taccoa Blackwatch Firenza Patagonia Tanzania Pedigree Blade Runner II Five Point Trio Bonsai **Focus** Picasso Tahoe II Braveheart Forte **Piedmont** Talladega Bravo Garrison Plantation Tarheel Proseeds 5301 Bullseye Gazelle II Terrano Cannavaro Gold Medallion **Prospect** Titan Itd Pure Gold Titanium LS Catalyst Grande 3 Tracer Cayenne Greenbrooks Ouest Cessane Rz Greenkeeper Raptor II Traverse SRP Chipper Gremlin Rebel Exeda Tulsa Time Cochise IV Grevstone Rebel Sentry Turbo Turbo RZ Constitution Guardian 21 Rebel IV Corgi Guardian 41 Regiment II Tuxedo RZ Corona Hemi Ultimate Regenerate Coyote Honky Tonk Rendition Venture Darlington Hot Rod Rhambler 2 SRP Umbrella Davinci Hunter Rembrandt Van Gogh Desire Inferno Reunion Watchdog Wolfpack II Dominion Riverside Innovator **Dynamic** Integrity **RNP** Xtremegreen Dynasty Jaguar 3 Rocket Endeavor Jamboree Scorpion

Approved Kentucky Bluegrass Cultivars:

4-Season	Blue Velvet	Gladstone	Quantum Leap
Alexa II	Blueberry	Granite	Rambo
America	Boomerang	Hampton	Rhapsody
Apollo	Brilliant	Harmonie	Rhythm
Arcadia	Cabernet	Impact	Rita
Aries	Champagne	Jefferson	Royce
Armada	Champlain	Juliet	Rubicon
Arrow	Chicago II	Jump Start	Rugby II
Arrowhead	Corsair	Keeneland	Shiraz
Aura	Courtyard	Langara	Showcase
Avid	Delight	Liberator	Skye
Award	Diva	Madison	Solar Eclipse
Awesome	Dynamo	Mercury	Sonoma
Bandera	Eagleton	Midnight	Sorbonne
Barduke	Emblem	Midnight II	Starburst
Barnique	Empire	Moon Shadow	Sudden Impact
Baroness	Envicta	Moonlight SLT	Total Eclipse
Barrister	Everest	Mystere	Touche
Barvette HGT	Everglade	Nu Destiny	Tsunami
Bedazzled	Excursion	NuChicago	Unique
Belissimo	Freedom II	NuGlade	Valor
Bewitched	Freedom III	Odyssey	Voyager II
Beyond	Front Page	Perfection	Washington
Blacksburg II	Futurity	Pinot	Zinfandel
Blackstone	Gaelic	Princeton 105	
Blue Note	Ginney II	Prosperity	

Approved Hard Fescue Cultivars:

Aurora II	Eureka II	Oxford	Scaldis II
Aurora Gold	Firefly	Reliant II	Spartan II
Berkshire	Granite	Reliant IV	Stonehenge
Bighorn GT	Heron	Rescue 911	
Chariot	Nordic	Rhino	

On cut and fill slopes 2:1 or steeper add 20# Sericea Lespedeza and 15# Crown Vetch January 1 - December 31.

The Crown Vetch Seed should be double inoculated if applied with a hand seeder. Four times the normal rate of inoculant should be used if applied with a hydroseeder. If a fertilizer-seed slurry is used, the required limestone should also be included to prevent fertilizer acidity from killing the inoculant bacteria. Caution should be used to keep the inoculant below 80° F to prevent harm to the bacteria. The rates and grades of fertilizer and limestone shall be the same as specified for *Seeding and Mulching*.

Fertilizer shall be 10-20-20 analysis. A different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis and as directed.

Native Grass Seeding And Mulching

(West)

Native Grass Seeding and Mulching shall be performed on the disturbed areas of wetlands and riparian areas, and adjacent to Stream Relocation and/or trout stream construction within a 50 foot zone on both sides of the stream or depression, measured from top of stream bank or center of depression. The stream bank of the stream relocation shall be seeded by a method that does not alter the typical cross section of the stream bank. Native Grass Seeding and Mulching shall also be performed in the permanent soil reinforcement mat section of preformed scour holes, and in other areas as directed.

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

August 1 - June 1		May 1 – September 1	
18#	Creeping Red Fescue	18#	Creeping Red Fescue
8#	Big Bluestem	8#	Big Bluestem
6#	Indiangrass	6#	Indiangrass
4#	Switchgrass	4#	Switchgrass
35#	Rye Grain	25#	German or Browntop Millet
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Approved Creeping Red Fescue Cultivars:

Aberdeen	Boreal	Epic	Cindy Lou

Fertilizer shall be 10-20-20 analysis. A different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis and as directed.

Native Grass Seeding and Mulching shall be performed in accordance with Section 1660 of the *Standard Specifications* and vegetative cover sufficient to restrain erosion shall be installed immediately following grade establishment.

Measurement and Payment

Native Grass *Seeding and Mulching* will be measured and paid for in accordance with Article 1660-8 of the *Standard Specifications*.

TEMPORARY SEEDING:

Fertilizer shall be the same analysis as specified for *Seeding and Mulching* and applied at the rate of 400 pounds and seeded at the rate of 50 pounds per acre. German Millet, or Browntop Millet shall be used in summer months and rye grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

FERTILIZER TOPDRESSING:

Fertilizer used for topdressing shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre. A different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis and as directed.

SUPPLEMENTAL SEEDING:

The kinds of seed and proportions shall be the same as specified for *Seeding and Mulching*, and the rate of application may vary from 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

MOWING:

The minimum mowing height on this project shall be six inches.

LAWN TYPE APPEARANCE:

All areas adjacent to lawns must be hand finished as directed to give a lawn type appearance. Remove all trash, debris, and stones ³/₄" and larger in diameter or other obstructions that could interfere with providing a smooth lawn type appearance. These areas shall be reseeded to match their original vegetative conditions, unless directed otherwise by the Field Operations Engineer.

RESPONSE FOR EROSION CONTROL:

Description

Furnish the labor, materials, tools and equipment necessary to move personnel, equipment, and supplies to the project necessary for the pursuit of any or all of the following work as shown herein, by an approved subcontractor.

Section	Erosion Control Item	Unit
1605	Temporary Silt Fence	LF
1606	Special Sediment Control Fence	LF/TON
1615	Temporary Mulching	ACR
1620	Seed - Temporary Seeding	LB
1620	Fertilizer - Temporary Seeding	TN
1631	Matting for Erosion Control	SY
SP	Coir Fiber Mat	SY
1640	Coir Fiber Baffles	LF
SP	Permanent Soil Reinforcement Mat	SY
1660	Seeding and Mulching	ACR
1661	Seed - Repair Seeding	LB
1661	Fertilizer - Repair Seeding	TON
1662	Seed - Supplemental Seeding	LB
1665	Fertilizer Topdressing	TON
SP	Safety/Highly Visible Fencing	LF
SP	Response for Erosion Control	EA

Construction Methods

Provide an approved subcontractor who performs an erosion control action as described in the NPDES Inspection Form SPPP30. Each erosion control action may include one or more of the above work items.

Measurement and Payment

Response for Erosion Control will be measured and paid for by counting the actual number of times the subcontractor moves onto the project, including borrow and waste sites, and satisfactorily completes an erosion control action described in Form 1675. The provisions of Article 104-5 of the *Standard Specifications* will not apply to this item of work.

Payment will be made under:

Pay Item
Response for Erosion Control
Each

MINIMIZE REMOVAL OF VEGETATION:

The Contractor shall minimize removal of vegetation within project limits to the maximum extent practicable. Vegetation along stream banks and adjacent to other jurisdictional resources outside the construction limits shall only be removed upon approval of Engineer. No additional payment will be made for this minimization work.

STOCKPILE AREAS:

The Contractor shall install and maintain erosion control devices sufficient to contain sediment around any erodible material stockpile areas as directed.

ACCESS AND HAUL ROADS:

At the end of each working day, the Contractor shall install or re-establish temporary diversions or earth berms across access/haul roads to direct runoff into sediment devices. Silt fence sections that are temporarily removed shall be reinstalled across access/haul roads at the end of each working day.

CONSTRUCTION MATERIALS MANAGEMENT

(3-19-19) (rev. 04-27-19)

Description

The requirements set forth shall be adhered to in order to meet the applicable materials handling requirements of the NCG010000 permit. Structural controls installed to manage construction materials stored or used on site shall be shown on the E&SC Plan. Requirements for handling materials on construction sites shall be as follows:

Polyacrylamides (PAMS) and Flocculants

Polyacrylamides (PAMS) and flocculants shall be stored in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures designed to protect adjacent surface waters. PAMS or other flocculants used shall be selected from the NC DWR List of Approved PAMS/Flocculants The concentration of PAMS and other flocculants used shall not exceed those specified in the NC DWR List of Approved PAMS/Flocculants and in accordance with the manufacturer's instructions. The NC DWR List of Approved PAMS/Flocculants is available at:

 $\frac{https://files.nc.gov/ncdeq/Water\%20Quality/Environmental\%20Sciences/ATU/ApprovedPAMS}{4_1_2017.pdf}$

Equipment Fluids

Fuels, lubricants, coolants, and hydraulic fluids, and other petroleum products shall be handled and disposed of in a manner so as not to enter surface or ground waters and in accordance with applicable state and federal regulations. Equipment used on the site must be operated and maintained properly to prevent discharge of fluids. Equipment, vehicle, and other wash waters shall not be discharged into E&SC basins or other E&SC devices. Alternative controls should be provided such that there is no discharge of soaps, solvents, or detergents.

Waste Materials

Construction materials and land clearing waste shall be disposed of in accordance with North Carolina General Statutes, Chapter 130A, Article 9 - Solid Waste Management, and rules governing the disposal of solid waste (15A NCAC 13B). Areas dedicated for managing construction material and land clearing waste shall be at least 50 feet away from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. Paint and other liquid construction material waste shall not be dumped into storm drains. Paint and other liquid construction waste washouts should be located at least 50 feet away from storm drain inlets unless there is no alternative. Other options are to install lined washouts or use portable, removable bags or bins. Hazardous or toxic waste shall be managed in accordance with the federal Resource Conservation and Recovery Act (RCRA) and NC Hazardous Waste Rules at 15A NCAC, Subchapter 13A. Litter and sanitary waste shall be managed in a manner to prevent it from entering jurisdictional waters and shall be disposed of offsite.

Herbicide, Pesticide, and Rodenticides

Herbicide, pesticide, and rodenticides shall be stored and applied in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act, North Carolina Pesticide Law of 1971 and labeling restrictions.

Concrete Materials

Concrete materials onsite, including excess concrete, must be controlled and managed to avoid contact with surface waters, wetlands or buffers. No concrete or cement slurry shall be discharged from the site. (Note that discharges from onsite concrete plants require coverage under a separate NPDES permit – NCG140000.) Concrete wash water shall be managed in accordance with the *Concrete Washout Structure* provision. Concrete slurry shall be managed and disposed of in accordance with *NCDOT DGS and HOS DCAR Distribution of Class A Residuals Statewide* (Permit No. WQ0035749). Any hardened concrete residue will be disposed of, or recycled on site, in accordance with state solid waste regulations.

Earthen Material Stock Piles

Earthen material stock piles shall be located at least 50 feet away from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available.

Measurement and Payment

Conditions set within the *Construction Materials Management* provision are incidental to the project for which no direct compensation will be made.

WASTE AND BORROW SOURCES:

Payment for temporary erosion control measures, except those made necessary by the Contractor's own negligence or for his own convenience, will be paid for at the appropriate contract unit price for the devices or measures utilized in borrow sources and waste areas.

No additional payment will be made for erosion control devices or permanent seeding and mulching in any commercial borrow or waste pit. All erosion and sediment control practices that may be required on a commercial borrow or waste site will be done at the Contractor's expense.

All offsite Staging Areas, Borrow and Waste sites shall be in accordance with "Borrow and Waste Site Reclamation Procedures for Contracted Projects" located at:

 $\frac{https://connect.ncdot.gov/resources/roadside/FieldOperationsDocuments/ContractedReclamation}{Procedures.pdf}$

All forms and documents referenced in the "Borrow and Waste Site Reclamation Procedures for Contracted Projects" shall be included with the reclamation plans for offsite staging areas, and borrow and waste sites.

TEMPORARY DIVERSION:

This work consists of installation, maintenance, and cleanout of *Temporary Diversions* in accordance with Section 1630 of the *Standard Specifications*. The quantity of excavation for installation and cleanout will be measured and paid for as *Silt Excavation* in accordance with Article 1630-3 of the *Standard Specifications*.

CLEAN WATER DIVERSION:

Description

This work consists of installing, maintaining, and removing any and all material required for the construction of clean water diversions. The clean water diversions shall be used to direct water flowing from offsite around/away from specific area(s) of construction.

Materials

Refer to Division 10

ItemSectionGeotextile for Soil Stabilization, Type 41056

Construction Methods

The Contractor shall install the clean water diversions in accordance with the details in the plans and at locations indicated in the plans, and as directed. Upon installation, the excavated material

shall be immediately stabilized as provided in Section 1620 of the *Standard Specifications*. Other stabilization methods may be utilized with prior approval from the Engineer.

Line clean water diversion with geotextile unrolled in the direction of flow and lay smoothly but loosely on soil surface without creases. Bury top of slope geotextile edge in a trench at least 5" deep and tamp securely. Make vertical overlaps a minimum of 18" with upstream geotextile overlapping the downstream geotextile.

Secure geotextile with eleven gauge wire staples shaped into a u shape with a length of not less than 6" and a throat not less than 1" in width. Place staples along outer edges and throughout the geotextile a maximum of 3 ft. horizontally and vertically.

Measurement and Payment

Silt Excavation will be measured and paid for in accordance with Article 1630-4 of the *Standard Specifications*.

Geotextile for Soil Stabilization will be measured and paid for in accordance with Article 270-4 of the *Standard Specifications*.

Stabilization of the excavated material will be paid for as *Temporary Seeding* as provided in Section 1620 of the *Standard Specifications*.

Such price and payment shall be considered full compensation for all work covered by this section including all materials, construction, maintenance, and removal of the clean water diversions.

SAFETY FENCE AND JURISDICTIONAL FLAGGING:

Description

Safety Fence shall consist of furnishing materials, installing and maintaining polyethylene or polypropylene fence along the outside riparian buffer, wetland, or water boundary, or other boundaries located within the construction corridor to mark the areas that have been approved to infringe within the buffer, wetland, endangered vegetation, culturally sensitive areas or water. The fence shall be installed prior to any land disturbing activities.

Interior boundaries for jurisdictional areas noted above shall be delineated by stakes and highly visible flagging.

Jurisdictional boundaries at staging areas, waste sites, or borrow pits, whether considered outside or interior boundaries shall be delineated by stakes and highly visible flagging.

Materials

(A) Safety Fencing

Polyethylene or polypropylene fence shall be a highly visible preconstructed safety fence approved by the Engineer. The fence material shall have an ultraviolet coating.

Either wood posts or steel posts may be used. Wood posts shall be hardwood with a wedge or pencil tip at one end, and shall be at least 5 ft. in length with a minimum nominal 2" x 2" cross section. Steel posts shall be at least 5 ft. in length, and have a minimum weight of 0.85 lb/ft of length.

(B) Boundary Flagging

Wooden stakes shall be 4 feet in length with a minimum nominal 3/4" x 1-3/4" cross section. The flagging shall be at least 1" in width. The flagging material shall be vinyl and shall be orange in color and highly visible.

Construction Methods

No additional clearing and grubbing is anticipated for the installation of this fence. The fence shall be erected to conform to the general contour of the ground.

(A) Safety Fencing

Posts shall be set at a maximum spacing of 10 ft., maintained in a vertical position and hand set or set with a post driver. Posts shall be installed a minimum of 2 ft. into the ground. If hand set, all backfill material shall be thoroughly tamped. Wood posts may be sharpened to a dull point if power driven. Posts damaged by power driving shall be removed and replaced prior to final acceptance. The tops of all wood posts shall be cut at a 30-degree angle. The wood posts may, at the option of the Contractor, be cut at this angle either before or after the posts are erected.

The fence geotextile shall be attached to the wood posts with one 2" galvanized wire staple across each cable or to the steel posts with wire or other acceptable means.

Place construction stakes to establish the location of the safety fence in accordance with Article 105-9 or Article 801-1 of the *Standard Specifications*. No direct pay will be made for the staking of the safety fence. All stakeouts for safety fence shall be considered incidental to the work being paid for as "Construction Surveying", except that where there is no pay item for construction surveying, all safety fence stakeout will be performed by state forces.

The Contractor shall be required to maintain the safety fence in a satisfactory condition for the duration of the project as determined by the Engineer.

(B) Boundary Flagging

Boundary flagging delineation of interior boundaries shall consist of wooden stakes on 25 feet maximum intervals with highly visible orange flagging attached. Stakes shall be installed a minimum of 6" into the ground. Interior boundaries may be staked on a tangent that runs parallel to buffer but must not encroach on the buffer at any location. Interior boundaries of hand clearing shall be identified with a different colored flagging to distinguish it from mechanized clearing.

Boundary flagging delineation of interior boundaries will be placed in accordance with Article 105-9 or Article 801-1 of the *Standard Specifications*. No direct pay will be made for delineation of the interior boundaries. This delineation will be considered incidental to the work being paid for as *Construction Surveying*, except that where there is no pay item or construction surveying the cost of boundary flagging delineation shall be included in the unit prices bid for the various items in the contract. Installation for delineation of all jurisdictional boundaries at staging areas, waste sites, or borrow pits shall consist of wooden stakes on 25 feet maximum intervals with highly visible orange flagging attached. Stakes shall be installed a minimum of 6" into the ground. Additional flagging may be placed on overhanging vegetation to enhance visibility but does not substitute for installation of stakes.

Installation of boundary flagging for delineation of all jurisdictional boundaries at staging areas, waste sites, or borrow pits shall be performed in accordance with Subarticle 230-4(B)(5) or Subarticle 802-2(F) of the *Standard Specifications*. No direct pay will be made for this delineation, as the cost of same shall be included in the unit prices bid for the various items in the contract.

The Contractor shall be required to maintain alternative stakes and highly visible flagging in a satisfactory condition for the duration of the project as determined by the Engineer.

Measurement and Payment

Safety Fence will be measured and paid as the actual number of linear feet of polyethylene or polypropylene fence installed in place and accepted. Such payment will be full compensation including but not limited to furnishing and installing fence geotextile with necessary posts and post bracing, staples, tie wires, tools, equipment and incidentals necessary to complete this work.

Payment will be made under:

Pay ItemPay UnitSafety FenceLinear Foot

PERMANENT SOIL REINFORCEMENT MAT:

Description

This work consists of furnishing and placing *Permanent Soil Reinforcement Mat*, of the type specified, over previously prepared areas as directed.

Materials

The product shall be a permanent erosion control reinforcement mat and shall be constructed of synthetic or a combination of coconut and synthetic fibers evenly distributed throughout the mat between a bottom UV stabilized netting and a heavy duty UV stabilized top net. The matting shall be stitched together with UV stabilized polypropylene thread to form a permanent three-dimensional structure. The mat shall have the following minimum physical properties:

Property	Test Method	Value	Unit
Light Penetration	ASTM D6567	9	%
Thickness	ASTM D6525	0.40	in
Mass Per Unit Area	ASTM D6566	0.55	lb/sy
Tensile Strength	ASTM D6818	385	lb/ft
Elongation (Maximum)	ASTM D6818	49	%
Resiliency	ASTM D1777	>70	%
UV Stability *	ASTM D4355	<u>≥</u> 80	%
Porosity (Permanent Net)	ECTC Guidelines	<u>≥</u> 85	%
Maximum Permissible Shear	Performance Bench	<u>≥</u> 8.0	lb/ft ²
Stress (Vegetated)	Test		
Maximum Allowable Velocity	Performance Bench	≥16.0	ft/s
(Vegetated)	Test		

^{*}ASTM D1682 Tensile Strength and % strength retention of material after 1000 hours of exposure.

Submit a certification (Type 1, 2, or 3) from the manufacturer showing:

- (A) the chemical and physical properties of the mat used, and
- (B) conformance of the mat with this specification.

Construction Methods

Matting shall be installed in accordance with Subarticle 1631-3(B) of the *Standard Specifications*.

All areas to be protected with the mat shall be brought to final grade and seeded in accordance with Section 1660 of the *Standard Specifications*. The surface of the soil shall be smooth, firm, stable and free of rocks, clods, roots or other obstructions that would prevent the mat from lying in direct contact with the soil surface. Areas where the mat is to be placed will not need to be mulched.

Measurement and Payment

Permanent Soil Reinforcement Mat will be measured and paid for as the actual number of square yards measured along the surface of the ground over which Permanent Soil Reinforcement Mat is installed and accepted. Overlaps will not be included in the measurement, and will be considered as incidental to the work. Such payment shall be full compensation for furnishing and installing the mat, including overlaps, and for all required maintenance.

Payment will be made under:

Pay ItemPay UnitPermanent Soil Reinforcement MatSquare Yard

SKIMMER BASIN WITH BAFFLES:

Description

Provide a skimmer basin to remove sediment from construction site runoff at locations shown in the erosion control plans. See the Skimmer Basin with Baffles Detail sheet provided in the erosion control plans. Work includes constructing sediment basin, installation of temporary slope drain pipe and coir fiber baffles, furnishing, installation and cleanout of skimmer, providing and placing stone pad on bottom of basin underneath skimmer device, providing and placing a geotextile spillway liner, providing coir fiber mat stabilization for the skimmer outlet, disposing of excess materials, removing temporary slope drain, coir fiber baffles, geotextile liner and skimmer device, backfilling basin area with suitable material and providing proper drainage when basin area is abandoned.

Materials

Item	Section
Stone for Erosion Control, Class B	1042
Geotextile for Soil Stabilization, Type 4	1056
Fertilizer for Temporary Seeding	1060-2
Seed for Temporary Seeding	1060-4
Seeding and Mulching	1060-4
Matting for Erosion Control	1060-8
Staples	1060-8
Coir Fiber Mat	1060-14
Temporary Slope Drain	1622-2
Coir Fiber Baffle	1640

Provide appropriately sized and approved skimmer device.

Provide Schedule 40 PVC pipe with a length of 6 ft. to attach to the skimmer and the coupling connection to serve as the arm pipe. For skimmer sizes of 2.5 in. and smaller, the arm pipe diameter shall be 1.5 inches. For skimmer sizes of 3 in. and larger, refer to manufacturer recommendation.

Provide 4" diameter Schedule 40 PVC pipe to attach to coupling connection of skimmer to serve as the barrel pipe through the earthen dam.

Anchors: Staples, stakes, or reinforcement bars shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes 12"- 24" long with a 2" x 2" nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving through the coir fiber mat and down into the underlying soil. The other end of the stake needs to have a 1"- 2" long head at the top with a 1"- 2" notch following to catch and secure the coir fiber mat.

Steel Reinforcement Bars:

Provide uncoated #10 steel reinforcement bars 24" nominal length. The bars shall have a 4" diameter bend at one end with a 4" straight section at the tip to catch and secure the coir fiber mat.

Staples:

Provide staples made of 0.125" diameter new steel wire formed into a u shape not less than 12" in length with a throat of 1" in width.

Construction Methods

Excavate basin according to the erosion control plans with basin surface free of obstructions, debris, and pockets of low-density material. Install temporary slope drain pipe and construct the primary spillway according to the Skimmer Basin with Baffles Detail sheet in the erosion control plans. Temporary slope drain pipe at inlet of basin may be replaced by geotextile as directed. Construct the coir fiber baffles according to *Roadway Standard Drawings* No. 1640.01 and Section 1640 of the *Standard Specifications*.

Install skimmer device according to manufacturer recommendations. Install 4" Schedule 40 PVC pipe into dam on the lower side of basin 1 ft. from the bottom of the basin and according to the detail, and extend the pipe so the basin will drain. Attach a 6 ft. arm pipe to the coupling connection and skimmer according to manufacturer recommendations. The coupling shall be rigid and non-buoyant and not exceed a diameter of 4" and 12" in length. Attach the rope included with the skimmer to the tee between the vent socket and the tube inlet, and the other end to a wooden stake or metal post. Clean out skimmer device when it becomes clogged with sediment and/or debris and is unable to float at the top of water in skimmer basin. Take appropriate measures to avoid ice accumulation in the skimmer device. Construct a stone pad of Class B stone directly underneath the skimmer device at bottom of basin. The pad shall be a minimum of 12" in height, and shall have a minimum cross sectional area of 4 ft. by 4 ft.

Line primary spillway with geotextile unrolled in the direction of flow and lay smoothly but loosely on soil surface without creases. Bury edges of geotextile in a trench at least 5" deep and tamp firmly. If geotextile for the primary spillway is not one continuous piece of material, make horizontal overlaps a minimum of 18" with upstream geotextile overlapping the downstream geotextile. Secure geotextile with eleven gauge wire staples shaped into a u shape with a length

of not less than 12" and a throat not less than 1" in width. Place staples along outer edges and throughout the geotextile a maximum of 3 ft. horizontally and vertically. Geotextile shall be placed to the bottom and across the entire width of the basin according to the Skimmer Basin with Baffles detail. Place sealant inside basin around barrel pipe on top of geotextile with a minimum width of 6 in.

At the skimmer outlet, provide a smooth soil surface free from stones, clods, or debris that will prevent contact of the coir fiber matting with the soil. Unroll the matting and apply without stretching such that it will lie smoothly but loosely on the soil surface. Wooden stakes, reinforcement bars, or staples may be used as anchors in accordance with the details in the plans and as directed. Place anchors across the matting at the ends approximately 1 ft. apart. Place anchors along the outer edges and down the center of the matting 3 ft. apart.

All bare side slope sections of the skimmer basin shall be seeded with a temporary or permanent seed mix as directed and in accordance with Articles 1620-3, 1620-4, 1620-5, 1660-4, 1660-5 and 1660-7 of the *Standard Specifications*. Straw or excelsior matting shall be installed on all bare side slope sections immediately upon the completion of seeding and in accordance with Article 1631-3 of the *Standard Specifications*.

Measurement and Payment

Silt Excavation will be measured and paid for in accordance with Article 1630-4 of the *Standard Specifications*, as calculated from the typical section throughout the length of the basin as shown on the final approved plans.

Geotextile for Soil Stabilization will be measured and paid for in accordance with Article 270-4 of the *Standard Specifications*.

Coir Fiber Baffles will be measured and paid for in accordance with Article 1640-4 of the Standard Specifications.

__" Skimmer will be measured in units of each. __" Skimmer will be measured and paid for as the maximum number of each size skimmer acceptably installed and in use at any one time during the life of the project. Barrel and arm pipe, cleanout, relocation and reinstallation of __" Skimmer is considered incidental to the measurement of the quantity of __" Skimmer and no separate payment will be made. No separate payment shall be made if __" Skimmer, barrel and/or arm pipe(s) are damaged by ice accumulation.

Coir Fiber Mat will be measured and paid for as the actual number of square yards measured along the surface of the ground over which coir fiber mat is installed and accepted.

Temporary Slope Drain will be measured and paid for in accordance with Article 1622-4 of the *Standard Specifications*.

Stone for Erosion Control, Class __ will be measured and paid for in accordance with Article 1610-4 of the Standard Specifications.

Seeding and Mulching will be measured and paid for in accordance with Article 1660-8 of the Standard Specifications.

Seed for Temporary Seeding will be measured and paid for in accordance with Article 1620-6 of the *Standard Specifications*.

Fertilizer for Temporary Seeding will be measured and paid for in accordance with Article 1620-6 of the Standard Specifications.

Matting for Erosion Control will be measured and paid for in accordance with Article 1631-4 of the *Standard Specifications*.

No measurement will be made for other items or for over excavation or stockpiling.

Payment will be made under:

Pay Item	Pay Unit
" Skimmer	Each
Coir Fiber Mat	Square Yard

TIERED SKIMMER BASIN WITH BAFFLES:

Description

Provide a tiered skimmer basin to remove sediment from construction site runoff at locations shown in the erosion control plans. See the Tiered Skimmer Basin Detail sheet provided in the erosion control plans. Tiered Skimmer Basins shall be installed in areas where topography creates a large elevation difference between the inlet and outlet of a single skimmer basin. Work includes constructing sediment basins, installation of coir fiber baffles, installation of temporary slope drain pipe, furnishing, installation and cleanout of skimmer, providing and placing stone pad on bottom of basin underneath skimmer device, providing and placing geotextile spillway liners, providing coir fiber mat stabilization for the skimmer outlet, disposing of excess materials, removing temporary slope drain pipe, coir fiber baffles, geotextile liner and skimmer device, backfilling basin area with suitable material and providing proper drainage when basin area is abandoned.

Materials

Item	Section
Stone for Erosion Control, Class B	1042
Geotextile for Soil Stabilization, Type 4	1056
Fertilizer for Temporary Seeding	1060-2
Seed for Temporary Seeding	1060-4
Seeding and Mulching	1060-4
Matting for Erosion Control	1060-8
Staples	1060-8
Coir Fiber Mat	1060-14

Temporary Slope Drain Coir Fiber Baffle 1622-2 1640

Provide appropriately sized and approved skimmer device.

Provide Schedule 40 PVC pipe with a length of 6 ft. to attach to the skimmer and the coupling connection to serve as the arm pipe. For skimmer sizes of 2.5 in. and smaller, the arm pipe diameter shall be 1.5 inches. For skimmer sizes of 3 in. and larger, refer to manufacturer recommendation.

Provide 4" diameter Schedule 40 PVC pipe to attach to coupling connection of skimmer to serve as the barrel pipe through the earthen dam.

Anchors: Staples, stakes, or reinforcement bars shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes 12"- 24" long with a 2" x 2" nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving through the coir fiber mat and down into the underlying soil. The other end of the stake needs to have a 1"- 2" long head at the top with a 1"- 2" notch following to catch and secure the coir fiber mat.

Steel Reinforcement Bars:

Provide uncoated #10 steel reinforcement bars 24" nominal length. The bars shall have a 4" diameter bend at one end with a 4" straight section at the tip to catch and secure the coir fiber mat.

Staples:

Provide staples made of 0.125" diameter new steel wire formed into a u shape not less than 12" in length with a throat of 1" in width.

Construction Methods

Excavate basins according to the erosion control plans with basin surface free of obstructions, debris, and pockets of low-density material. Install temporary slope drain pipe and construct the primary spillways according to the Tiered Skimmer Basin Detail sheet in the erosion control plans. Construct the coir fiber baffles according to *Roadway Standard Drawings* No. 1640.01 and Section 1640 of the *Standard Specifications*. Multiple upper basins, or Modified Silt Basins Type 'B' as labeled on the detail, may be required based on site conditions and as directed.

Install skimmer device according to manufacturer recommendations. Install 4" Schedule 40 PVC pipe into dam on the lower side of basin 1 ft. from the bottom of the basin and according to the detail, and extend the pipe so the basin will drain. Attach a 6 ft. arm pipe to the coupling connection and skimmer according to manufacturer recommendations. The coupling shall be rigid and non-buoyant and not exceed a diameter of 4" and 12" in length. Attach the rope included with the

skimmer to the tee between the vent socket and the tube inlet, and the other end to a wooden stake or metal post. Clean out skimmer device when it becomes clogged with sediment and/or debris and is unable to float at the top of water in skimmer basin. Take appropriate measures to avoid ice accumulation in the skimmer device. Construct a stone pad of Class B stone directly underneath the skimmer device at bottom of basin. The pad shall be a minimum of 12" in height, and shall have a minimum cross sectional area of 4 ft. by 4 ft.

Line primary spillways with geotextile unrolled in the direction of flow and lay smoothly but loosely on soil surface without creases. Bury edges of geotextile in a trench at least 5" deep and tamp firmly. If geotextile for primary spillways is not one continuous piece of material, make horizontal overlaps a minimum of 18" with upstream geotextile overlapping the downstream geotextile. Secure geotextile with eleven gauge wire staples shaped into a *u* shape with a length of not less than 12" and a throat not less than 1" in width. Place staples along outer edges and throughout the geotextile a maximum of 3 ft. horizontally and vertically. Geotextile shall be placed to the bottom and across the entire width of the basin according to the Tiered Skimmer Basin with Baffles detail.

At the skimmer outlet, provide a smooth soil surface free from stones, clods, or debris that will prevent contact of the coir fiber matting with the soil. Unroll the matting and apply without stretching such that it will lie smoothly but loosely on the soil surface. Wooden stakes, reinforcement bars, or staples may be used as anchors in accordance with the details in the plans and as directed. Place anchors across the matting at the ends approximately 1 ft. apart. Place anchors along the outer edges and down the center of the matting 3 ft. apart. Place sealant inside basin around barrel pipe on top of geotextile with a minimum width of 6 in.

All bare side slope sections of the skimmer basin shall be seeded with a temporary or permanent seed mix as directed and in accordance with Articles 1620-3, 1620-4, 1620-5, 1660-4, 1660-5 and 1660-7 of the *Standard Specifications*. Straw or excelsior matting shall be installed on all bare side slope sections immediately upon the completion of seeding and in accordance with Article 1631-3 of the *Standard Specifications*.

Measurement and Payment

Silt Excavation will be measured and paid for in accordance with Article 1630-4 of the *Standard Specifications*, as calculated from the typical section throughout the length of the basin as shown on the final approved plans.

Geotextile for Soil Stabilization will be measured and paid for in accordance with Article 270-4 of the *Standard Specifications*.

Coir Fiber Baffles will be measured and paid for in accordance with Article 1640-4 of the Standard Specifications.

__" *Skimmer* will be measured in units of each. __" *Skimmer* will be measured and paid for as the maximum number of each size skimmer acceptably installed and in use at any one time during the life of the project. Barrel and arm pipe, cleanout, relocation and reinstallation of "*Skimmer* is

considered incidental to the measurement of the quantity of __" *Skimmer* and no separate payment will be made. No separate payment shall be made if __" *Skimmer*, barrel and/or arm pipe(s) are damaged by ice accumulation.

Coir Fiber Mat will be measured and paid for as the actual number of square yards measured along the surface of the ground over which coir fiber mat is installed and accepted.

Temporary Slope Drain will be measured and paid for in accordance with Article 1622-4 of the *Standard Specifications*.

Stone for Erosion Control, Class __ will be measured and paid for in accordance with Article 1610-4 of the Standard Specifications.

Seeding and Mulching will be measured and paid for in accordance with Article 1660-8 of the Standard Specifications.

Seed for Temporary Seeding will be measured and paid for in accordance with Article 1620-6 of the *Standard Specifications*.

Fertilizer for Temporary Seeding will be measured and paid for in accordance with Article 1620-6 of the Standard Specifications.

Matting for Erosion Control will be measured and paid for in accordance with Article 1631-4 of the *Standard Specifications*.

No measurement will be made for other items or for over excavation or stockpiling.

Payment will be made under:

Pay Item
__" Skimmer
Coir Fiber Mat

Pay Unit
Each
Square Yard

EARTHEN DAM WITH SKIMMER:

Description

Provide an earthen dam with a skimmer attached to a barrel pipe at the outlet of a proposed roadway ditch to remove sediment from construction site runoff at locations shown in the erosion control plans. See the Earthen Dam with Skimmer Detail sheet provided in the erosion control plans. Work includes constructing earthen dam, installation of coir fiber baffles, furnishing, installation and cleanout of skimmer, providing and placing stone pad on bottom of ditch underneath skimmer device, providing and placing geotextile spillway liner, providing coir fiber mat stabilization for the skimmer outlet, removing earthen dam, coir fiber baffles, geotextile liner and skimmer device, and disposing of excess materials.

Materials

Item	Section
Stone for Erosion Control, Class B	1042
Geotextile for Soil Stabilization, Type 4	1056
Staples	1060-8
Coir Fiber Mat	1060-14
Coir Fiber Baffle	1640

Provide appropriately sized and approved skimmer device.

Provide Schedule 40 PVC pipe with a length of 6 ft. to attach to the skimmer and the coupling connection to serve as the arm pipe. For skimmer sizes of 2.5 in. and smaller, the arm pipe diameter shall be 1.5 inches. For skimmer sizes of 3 in. and larger, refer to manufacturer recommendation.

Provide 4" diameter Schedule 40 PVC pipe to attach to coupling connection of skimmer to serve as the barrel pipe through the earthen dam.

Anchors: Staples, stakes, or reinforcement bars shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes 12"- 24" long with a 2" x 2" nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving through the coir fiber mat and down into the underlying soil. The other end of the stake needs to have a 1"- 2" long head at the top with a 1"- 2" notch following to catch and secure the coir fiber mat.

Steel Reinforcement Bars:

Provide uncoated #10 steel reinforcement bars 24" nominal length. The bars shall have a 4" diameter bend at one end with a 4" straight section at the tip to catch and secure the coir fiber mat.

Staples:

Provide staples made of 0.125" diameter new steel wire formed into a u shape not less than 12" in length with a throat of 1" in width.

Construction Methods

Excavate proposed ditch according to the roadway plans and cross sections with ditch surface free of obstructions, debris, and pockets of low-density material. Construct earthen dam and install the primary spillway according to the Earthen Dam with Skimmer Detail sheet in the erosion control plans. Construct the coir fiber baffles according to *Roadway Standard Drawings* No. 1640.01 and Section 1640 of the *Standard Specifications*. Accumulated silt behind the earthen dam and baffles shall be removed regularly and as directed.

Install skimmer device according to manufacturer recommendations. Install 4" Schedule 40 PVC pipe into dam on the lower side of basin 1 ft. from the bottom of the basin and according to the detail, and extend the pipe so the basin will drain. Attach a 6 ft. arm pipe to the coupling connection and skimmer according to manufacturer recommendations. The coupling shall be rigid and non-buoyant and not exceed a diameter of 4" and 12" in length. Attach the rope included with the skimmer to the tee between the vent socket and the tube inlet, and the other end to a wooden stake or metal post. Clean out skimmer device when it becomes clogged with sediment and/or debris and is unable to float at the top of water impounded in the ditch. Take appropriate measures to avoid ice accumulation in the skimmer device. Construct a stone pad of Class B stone directly underneath the skimmer device at bottom of ditch. The pad shall be a minimum of 12" in height, and shall have a minimum cross sectional area of 4 ft. by 4 ft.

Line primary spillway with geotextile unrolled in the direction of flow and lay smoothly but loosely on soil surface without creases. Bury edges of geotextile in a trench at least 5" deep and tamp firmly. If geotextile for the primary spillway is not one continuous piece of material, make horizontal overlaps a minimum of 18" with upstream geotextile overlapping the downstream geotextile. Secure geotextile with eleven gauge wire staples shaped into a *u* shape with a length of not less than 12" and a throat not less than 1" in width. Place staples along outer edges and throughout the geotextile a maximum of 3 ft. horizontally and vertically. Geotextile shall be placed to the bottom and across the entire width of the ditch according to the Earthen Dam with Skimmer Detail. Place sealant inside basin around barrel pipe on top of geotextile with a minimum width of 6 in.

At the skimmer outlet, provide a smooth soil surface free from stones, clods, or debris that will prevent contact of the coir fiber matting with the soil. Unroll the matting and apply without stretching such that it will lie smoothly but loosely on the soil surface. Wooden stakes, reinforcement bars, or staples may be used as anchors in accordance with the details in the plans and as directed. Place anchors across the matting at the ends approximately 1 ft. apart. Place anchors along the outer edges and down the center of the matting 3 ft. apart.

Measurement and Payment

The construction of the earthen dam will be paid for as *Borrow Excavation* as provided in Section 230 of the *Standard Specifications* or included in the lump sum price for grading.

Silt Excavation will be measured and paid for in accordance with Article 1630-4 of the *Standard Specifications*, as calculated from the typical section throughout the length of the ditch as shown on the final approved plans.

Geotextile for Soil Stabilization will be measured and paid for in accordance with Article 270-4 of the *Standard Specifications*.

Coir Fiber Baffles will be measured and paid for in accordance with Article 1640-4 of the Standard Specifications.

__" Skimmer will be measured in units of each. __" Skimmer will be measured and paid for as the maximum number of each size skimmer acceptably installed and in use at any one time during the life of the project. Barrel and arm pipe, cleanout, relocation and reinstallation of __" Skimmer is considered incidental to the measurement of the quantity of __" Skimmer and no separate payment will be made. No separate payment shall be made if __" Skimmer, barrel and/or arm pipe(s) are damaged by ice accumulation.

Coir Fiber Mat will be measured and paid for as the actual number of square yards measured along the surface of the ground over which coir fiber mat is installed and accepted.

Stone for Erosion Control, Class __ will be measured and paid for in accordance with Article 1610-4 of the Standard Specifications.

No measurement will be made for other items or for over excavation or stockpiling.

Payment will be made under:

Pay Item	Pay Unit
" Skimmer	Each
Coir Fiber Mat	Square Yard

STORMWATER BASIN EROSION CONTROL:

Description

Provide a skimmer to remove sediment from construction site runoff in permanent stormwater basins at locations shown in the erosion control plans. Work includes constructing basin, installation of coir fiber baffles, furnishing, installation and cleanout of skimmer, providing and placing stone pad on bottom of basin underneath skimmer device, stabilizing side slopes of basin with matting and seed, disposing of excess materials, removing coir fiber baffles, and skimmer device.

Materials

Item	Section
Seeding and Mulching	1060-4
Matting for Erosion Control	1060-8
Staples	1060-8
Coir Fiber Baffle	1640

Provide appropriately sized and approved skimmer device.

Provide Schedule 40 PVC pipe with a length of 6 ft. to attach to the skimmer and the coupling connection to serve as the arm pipe. For skimmer sizes of 2.5 in. and smaller, the arm pipe diameter shall be 1.5 inches. For skimmer sizes of 3 in. and larger, refer to manufacturer recommendation.

Provide 4" diameter Schedule 40 PVC pipe to attach to coupling connection of skimmer to serve as the barrel pipe through the earthen dam.

Construction Methods

Construct permanent stormwater basin according to the plans with basin surface free of obstructions, debris, and pockets of low-density material. Construct the coir fiber baffles according to *Roadway Standard Drawings* No. 1640.01 and Section 1640 of the *Standard Specifications*.

Install skimmer device according to manufacturer recommendations. Install the coupling connection provided with the skimmer 1 ft. from the bottom of the basin and attach to permanent stormwater drainage structure. Attach the 6 ft. arm pipe to the coupling connection and skimmer according to manufacturer recommendations. The coupling shall be rigid and non-buoyant and not exceed a diameter of 4" and 12" in length. Attach the rope included with the skimmer to the tee between the vent socket and the tube inlet, and the other end to a wooden stake or metal post. Clean out skimmer device when it becomes clogged with sediment and/or debris and is unable to float at the top of water in basin. Take appropriate measures to avoid ice accumulation in the skimmer device. Construct a stone pad of Class B stone directly underneath the skimmer device at bottom of basin. The pad shall be a minimum of 12" in height, and shall have a minimum cross sectional area of 4 ft. by 4 ft.

All bare side slope sections of the stormwater basin shall be seeded with a permanent seed mix as directed and in accordance with Articles 1660-4, 1660-5 and 1660-7 of the *Standard Specifications*. Straw or excelsior matting shall be installed on all bare side slope sections immediately upon the completion of seeding and in accordance with Article 1631-3 of the *Standard Specifications*.

Measurement and Payment

Silt Excavation will be measured and paid for in accordance with Article 1630-4 of the *Standard Specifications*, as calculated from the typical section throughout the length of the basin as shown on the final approved plans.

Coir Fiber Baffles will be measured and paid for in Accordance with Article 1640-4 of the Standard Specifications.

__" Skimmer will be measured in units of each. __" Skimmer will be measured and paid for as the maximum number of each size skimmer acceptably installed and in use at any one time during the life of the project. Barrel and arm pipe, cleanout, relocation and reinstallation of __" Skimmer is considered incidental to the measurement of the quantity of __" Skimmer and no separate payment will be made. No separate payment shall be made if __" Skimmer, barrel and/or arm pipe(s) are damaged by ice accumulation.

Stone for Erosion Control, Class __ will be measured and paid for in accordance with Article 1610-4 of the Standard Specifications.

Seeding and Mulching will be measured and paid for in accordance with Article 1660-8 of the Standard Specifications.

Matting for Erosion Control will be measured and paid for in accordance with Article 1631-4 of the *Standard Specifications*.

No measurement will be made for other items or for over excavation or stockpiling.

Payment will be made under:

Pay Item

" Skimmer

Each

COIR FIBER WATTLES WITH POLYACRYLAMIDE (PAM):

Description

Coir Fiber Wattles are tubular products consisting of coir fibers (coconut fibers) encased in coir fiber netting. Coir Fiber Wattles are used on slopes or channels to intercept runoff and act as a velocity break. Coir Fiber Wattles are to be placed at locations shown on the plans or as directed. Installation shall follow the detail provided in the plans and as directed. Work includes furnishing materials, installation of coir fiber wattles, matting installation, PAM application, and removing wattles.

Materials

Coir Fiber Wattle shall meet the following specifications:

100% Coir (Coconut) Fibers Minimum Diameter 12 in.

Minimum Density 3.5 lb/ft³ +/- 10%

Net Material Coir Fiber
Net Openings 2 in. x 2 in.
Net Strength 90 lbs.

Minimum Weight 2.6 lbs./ft. +/- 10%

Anchors: Stakes shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes a minimum of 2-ft. long with a 2 in. x 2 in. nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving down into the underlying soil.

Matting shall meet the requirements of Article 1060-8 of the *Standard Specifications*, or shall meet specifications provided elsewhere in this contract.

Provide staples made of 0.125" diameter new steel wire formed into a u shape not less than 12" in length with a throat of 1" in width.

Polyacrylamide (PAM) shall be applied in powder form and shall be anionic or neutrally charged. Soil samples shall be obtained in areas where the wattles will be placed, and from offsite material used to construct the roadway, and analyzed for the appropriate PAM flocculant to be utilized with each wattle. The PAM product used shall be listed on the North Carolina Department of Environmental Quality Division of Water Resources web site as an approved PAM product for use in North Carolina.

Construction Methods

Coir Fiber Wattles shall be secured to the soil by wire staples approximately every 1 linear foot and at the end of each section of wattle. A minimum of 4 stakes shall be installed on the downstream side of the wattle with a maximum spacing of 2 linear feet along the wattle, and according to the detail. Install a minimum of 2 stakes on the upstream side of the wattle according to the detail provided in the plans. Stakes shall be driven into the ground a minimum of 10 in. with no more than 2 in. projecting from the top of the wattle. Drive stakes at an angle according to the detail provided in the plans.

Only install coir fiber wattle(s) to a height in ditch so flow will not wash around wattle and scour ditch slopes and according to the detail provided in the plans and as directed. Overlap adjoining sections of wattles a minimum of 6 in.

Installation of matting shall be in accordance with the detail provided in the plans, and in accordance with Article 1631-3 of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

Apply PAM over the lower center portion of the coir fiber wattle where the water is going to flow over at a rate of 2 ounces per wattle, and 1 ounce of PAM on matting on each side of the wattle. PAM applications shall be done during construction activities after every rainfall event that is equal to or exceeds 0.50 in.

The Contractor shall maintain the coir fiber wattles until the project is accepted or until the wattles are removed, and shall remove and dispose of silt accumulations at the wattles when so directed in accordance with the requirements of Section 1630 of the *Standard Specifications*.

Measurement and Payment

Coir Fiber Wattles will be measured and paid for by the actual number of linear feet of wattles which are installed and accepted. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to install the Coir Fiber Wattles.

Matting will be measured and paid for in accordance with Article 1631-4 of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

Polyacrylamide(PAM) will be measured and paid for by the actual weight in pounds of PAM applied to the coir fiber wattles. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to apply the *Polyacrylamide(PAM)*.

Payment will be made under:

Pay ItemPay UnitPolyacrylamide(PAM)PoundCoir Fiber WattleLinear Foot

WATTLE BARRIER:

(5-20-13) 1630

Description

Wattle barriers are tubular products consisting of excelsior fibers encased in natural or synthetic netting and used at the toe of fills or on slopes to intercept runoff. Wattle barriers are to be placed at locations shown on the plans or as directed. Installation shall follow the detail provided in the plans and as directed. Work includes furnishing materials, installation, maintenance and removing wattle barriers.

Materials

Wattle shall meet the following specifications:

Inner Material	100% Curled Wood (Excelsior) Fibers
Minimum Diameter	18"
Minimum Length	10 ft.
Minimum Density	2.9 lb./c.f.± 10%
Net Material	Synthetic
Net Openings	1" x 1"
Net Configuration	Totally Encased
Minimum Weight	5 lb./ft. ± 10%

Stakes shall be used as anchors. Provide hardwood stakes a minimum of 2-ft long with a 2" x 2" nominal square cross section. One end of the stake shall be sharpened or beveled to facilitate driving down into the underlying soil.

Provide staples made of 0.125" diameter new steel wire formed into a U-shape not less than 12" in length with a throat of 1" in width.

Construction Methods

Align wattle barriers in an overlapping and alternating pattern. Excavate a trench the entire length of each wattle with a depth of 2" to 3" for the wattle to be placed. Secure wattle barriers to the soil

by wire staples approximately every linear foot and at the end of each wattle. Install at least 4 stakes on the downslope side of the wattle with a maximum spacing of 2 linear feet, and according to the detail. Install at least 2 stakes on the upslope side of the wattle barrier according to the detail provided in the plans. Drive stakes into the ground at least 10" with no more than 2" projecting from the top of the wattle. Drive stakes at an angle according to the detail provided in the plans.

For wattle barriers used to reduce runoff velocity for large slopes, use a maximum spacing of 25 ft. for the barrier measured along the slope.

Maintain the wattle barriers until the project is accepted or until the wattle barriers are removed, and remove and dispose of silt accumulations at the wattle barriers when so directed in accordance with Section 1630 of the *Standard Specifications*.

Measurement and Payment

Wattle Barrier will be measured and paid as the actual number of linear feet of wattles installed and accepted. Such price and payment will be full compensation for all work covered by this provision, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to install the wattle barrier.

Payment will be made under:

Pay ItemPay UnitWattle BarrierLinear Foot

TEMPORARY ROCK SILT CHECK TYPE A WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM):

Description

Temporary Rock Silt Checks Type A with Excelsior Matting and Polyacrylamide (PAM) are devices utilized in temporary and permanent ditches to reduce runoff velocity and incorporate PAM into the construction runoff to increase settling of sediment particles and reduce turbidity of runoff. Temporary Rock Silt Checks Type A with Excelsior Matting and PAM are to be placed at locations shown on the plans or as directed. Installation shall follow the detail provided in the plans and as directed. Work includes furnishing materials, installation of Temporary Rock Silt Checks Type A, matting installation, PAM application, and removing Temporary Rock Silt Checks Type A with Excelsior Matting and PAM.

Materials

Structural stone shall be class B stone that meets the requirements of Section 1042 of the *Standard Specifications* for Stone for Erosion Control, Class B.

Sediment control stone shall be #5 or #57 stone, which meets the requirements of Section 1005 of the *Standard Specifications* for these stone sizes.

Matting shall meet the requirements of Excelsior Matting in Subarticle 1060-8(B) of the *Standard Specifications*, or shall meet specifications provided elsewhere in this contract.

Polyacrylamide (PAM) shall be applied in powder form and shall be anionic or neutrally charged. Soil samples shall be obtained in areas where the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM will be placed, and from offsite material used to construct the roadway, and analyzed for the appropriate PAM flocculant to be utilized with each Temporary Rock Silt Check Type A. The PAM product used shall be listed on the North Carolina Department of Environmental Quality Division of Water Resources web site as an approved PAM product for use in North Carolina.

Construction Methods

Temporary Rock Silt Checks Type A shall be installed in accordance with Subarticle 1633-3(A) of the *Standard Specifications*, Roadway Standard Drawing No. 1633.01 and the detail provided in the plans.

Installation of matting shall be in accordance with the detail provided in the plans, and anchored by placing Class B stone on top of the matting at the upper and lower ends.

Apply PAM at a rate of 4 ounces over the center portion of the Temporary Rock Silt Checks Type A and matting where the water is going to flow over. PAM applications shall be done during construction activities and after every rainfall event that is equal to or exceeds 0.50 in.

The Contractor shall maintain the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM until the project is accepted or until the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM are removed, and shall remove and dispose of silt accumulations at the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM when so directed in accordance with the requirements of Section 1630 of the *Standard Specifications*.

Measurement and Payment

Temporary Rock Silt Checks Type A will be measured and paid for in accordance with Article 1633-5 of the Standard Specifications, or in accordance with specifications provided elsewhere in this contract.

Matting will be measured and paid for in accordance with Article 1631-4 of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

Polyacrylamide(PAM) will be measured and paid for by the actual weight in pounds of PAM applied to the Temporary Rock Silt Checks Type A. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to apply the *Polyacrylamide(PAM)*.

Payment will be made under:

Pay Item
Polyacrylamide(PAM)
Pound

CULVERT DIVERSION CHANNEL:

Description

This work consists of providing a *Culvert Diversion Channel* to detour the existing stream around the culvert construction site at locations shown on the plans. Work includes constructing the diversion channel, disposing of excess materials, providing and placing geotextile liner, maintaining the diversion area in an acceptable condition, removing geotextile liner, backfilling diversion channel area with suitable material, and providing proper drainage when diversion channel area is abandoned.

Materials

Refer to Division 10

ItemSectionGeotextile for Soil Stabilization, Type 41056

Construction Methods

Grade channel according to the plans with channel surface free of obstructions, debris, and pockets of low-density material. Utilize suitable material and provide disposal area for unsuitable material.

Line channel with geotextile unrolled in the direction of flow and lay smoothly but loosely on soil surface without creases. Bury top of slope geotextile edge in a trench at least 5" deep and tamp securely. Make vertical overlaps a minimum of 18" with upstream geotextile overlapping the downstream geotextile.

Secure geotextile with eleven gauge wire staples shaped into a u shape with a length of not less than 6" and a throat not less than 1" in width. Place staples along outer edges and throughout the geotextile a maximum of 3 ft. horizontally and vertically.

Measurement and Payment

Culvert Diversion Channel will be measured and paid for as the actual number of cubic yards excavated, as calculated from the typical section throughout the length of the diversion channel as shown on the final approved plans.

Geotextile for Soil Stabilization will be measured and paid for in accordance with Article 270-4 of the *Standard Specifications*.

Such price and payment shall be considered full compensation for all work covered by this section including all materials, construction, maintenance, and removal of *Culvert Diversion Channel*.

Payment will be made under:

Pay Item Pay Unit

Culvert Diversion Channel Cubic Yard

IMPERVIOUS DIKE:

Description

This work consists of furnishing, installing, maintaining, and removing an *Impervious Dike* for the purpose of diverting normal stream flow around the construction site. The Contractor shall construct an impervious dike in such a manner approved by the Engineer. The impervious dike shall not permit seepage of water into the construction site or contribute to siltation of the stream. The impervious dike shall be constructed of an acceptable material in the locations noted on the plans or as directed.

Materials

Acceptable materials shall include but not be limited to sheet piles, sandbags, and/or the placement of an acceptable size stone lined with polypropylene or other impervious geotextile.

Earth material shall not be used to construct an impervious dike when it is in direct contact with the stream unless vegetation can be established before contact with the stream takes place.

Measurement and Payment

Impervious Dike will be measured and paid as the actual number of linear feet of impervious dike(s) constructed, measured in place from end to end of each separate installation that has been completed and accepted. Such price and payment will be full compensation for all work including but not limited to furnishing materials, construction, maintenance, and removal of the impervious dike.

Payment will be made under:

Pay Item Pay Unit

Impervious Dike Linear Foot

TEMPORARY PIPE FOR CULVERT CONSTRUCTION:

Description

This work consists of furnishing, installing, maintaining and removing any and all temporary pipe used on this project in conjunction with the culvert construction.

Construction Methods

The Contractor shall install temporary pipe in locations shown on the plans in such a manner approved by the Engineer. The temporary pipe shall provide a passageway for the stream through the work-site. The minimum size requirements will be as stated on the erosion control plans.

Measurement and Payment

__" Temporary Pipe will be measured and paid for at the contract unit price per linear foot of temporary pipe approved by the Engineer and measured in place from end to end. Such price and payment will be full compensation for all work covered by this section including but not limited to furnishing all materials required for installation, construction, maintenance, and removal of temporary pipe.

Payment will be made under:

Pay Item Pay Unit
Temporary Pipe Linear Foot

PUMP AROUND OPERATION:

Description

The work covered by this section consists of furnishing, installing, maintaining and removing any and all pump around systems used on this project. The Contractor shall install a pump around system in locations as shown in the plans and in other locations approved by the Engineer. The pump around system shall provide a passageway for the stream flow around the work site.

The quantity of pump around systems may be increased, decreased, or eliminated entirely as directed. Such variations in quantity will not be considered as alterations in the details of construction or a change in the character of the work. See NCDOT *Best Management Practices for Construction and Maintenance Activities* manual for example pump around operation.

Materials

ItemSectionSpecial Stilling Basin1639

Impervious Dike shall meet the specifications as provided elsewhere in this contract.

Pumps shall be of sufficient size to divert the stream flow around the work area, as approved by the Engineer.

Construction Methods

Install $impervious\ dike(s)$ as shown on the plans or as directed. Pump water around the work site. If the water is turbid or exposed to bare soil, pump through a $special\ stilling\ basin$. Once the work is complete in an area remove the $impervious\ dike(s)$ and pump system, and stabilize the area.

Measurement and Payment

Impervious Dike will be measured and paid for as provided elsewhere in this contract.

Special Stilling Basin will be measured and paid for in accordance with Article 1639-4 of the Standard Specifications.

Payment for pumping operations shall be considered incidental to the work of installing pipes and culverts. The pumping operations shall include but not be limited to, diverting the stream flow around the work area and pumping runoff from the work area into a stilling basin, special stilling basin or other sediment control device. No additional payment will be made for furnishing materials or maintenance of the pumping operations for the installation of pipes and culverts.

The above prices and payments will be full compensation for all work covered by this section including, but not limited to furnishing all of the necessary materials, construction, maintenance and removal of the impervious dike and pump around system.

COIR FIBER MAT:

Description

Furnish material, install and maintain coir fiber mat in locations shown on the plans or in locations as directed. Work includes providing all materials, excavating and backfilling, and placing and securing coir fiber mat with stakes, steel reinforcement bars or staples as directed.

Materials

ItemSectionCoir Fiber Mat1060-14

Anchors: Stakes, reinforcement bars, or staples shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes 12"- 24" long with a 2" x 2" nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving through the coir fiber mat and down into the underlying soil. The other end of the stake needs to have a 1"- 2" long head at the top with a 1"- 2" notch following to catch and secure the coir fiber mat.

Steel Reinforcement Bars:

Provide uncoated #10 steel reinforcement bars 24" nominal length. The bars shall have a 4" diameter bend at one end with a 4" straight section at the tip to catch and secure the coir fiber mat.

Staples:

Provide staples made of 0.125" diameter new steel wire formed into a u shape not less than 12" in length with a throat of 1" in width.

Construction Methods

Place the coir fiber mat immediately upon final grading. Provide a smooth soil surface free from stones, clods, or debris that will prevent the contact of the mat with the soil. Unroll the mat and apply without stretching such that it will lie smoothly but loosely on the soil surface.

For stream relocation applications, take care to preserve the required line, grade, and cross section of the area covered. Bury the top slope end of each piece of mat in a narrow trench at least 6 in. deep and tamp firmly. Where one roll of matting ends and a second roll begins, overlap the end of the upper roll over the buried end of the second roll so there is a 6 in. overlap. Construct check trenches at least 12 in. deep every 50 ft. longitudinally along the edges of the mat or as directed. Fold over and bury mat to the full depth of the trench, close and tamp firmly. Overlap mat at least 6 in. where 2 or more widths of mat are installed side by side.

Place anchors across the mat at the ends approximately 1 ft. apart. Place anchors along the outer edges and down the center of the mat 3 ft. apart.

Adjustments in the trenching or anchoring requirements to fit individual site conditions may be required.

Measurement and Payment

Coir Fiber Mat will be measured and paid for as the actual number of square yards measured along the surface of the ground over which coir fiber mat is installed and accepted.

No measurement will be made for anchor items.

Payment will be made under:

Pay Item
Coir Fiber Mat
Square Yard

CONCRETE WASHOUT STRUCTURE:

(12-10-20)

Description

Concrete washout structures are enclosures above or below grade to contain concrete waste water and associated concrete mix from washing out ready-mix trucks, drums, pumps, or other equipment. Concrete washouts must collect and retain all the concrete washout water and solids, so that this material does not migrate to surface waters or into the ground water. These enclosures are not intended for concrete waste not associated with wash out operations.

The concrete washout structure may include constructed devices above or below ground and or commercially available devices designed specifically to capture concrete wash water.

Materials

ItemSectionTemporary Silt Fence1605

Safety Fence shall meet the specifications as provided elsewhere in this contract.

Geomembrane basin liner shall meet the following minimum physical properties for low permeability; it shall consist of a polypropylene or polyethylene 10 mil think geomembrane. If the minimum setback dimensions can be achieved the liner is not required. (5 feet above groundwater, 50 feet from top of bank of perennial stream, other surface water body, or wetland.)

Construction Methods

Build an enclosed earthen berm or excavate to form an enclosure in accordance with the details and as directed.

Install temporary silt fence around the perimeter of the enclosure in accordance with the details and as directed if structure is not located in an area where existing erosion and sedimentation control devices are capable to containing any loss of sediment.

Post a sign with the words "Concrete Washout" in close proximity of the concrete washout area, so it is clearly visible to site personnel. Install safety fence as directed for visibility to construction traffic.

The construction details for the above grade and below grade concrete washout structures can be found on the following web page link:

 $\underline{https://connect.ncdot.gov/resources/roadside/SoilWaterDocuments/ConcreteWashoutStructurede} \\ \underline{tail.pdf}$

Alternate details for accommodating concrete washout may be submitted for review and approval.

The alternate details shall include the method used to retain and dispose of the concrete waste water within the project limits and in accordance with the minimum setback requirements. (5 feet above groundwater, 50 feet from top of bank of perennial stream, other surface water body, or wetland.)

Maintenance and Removal

Maintain the concrete washout structure(s) to provide adequate holding capacity plus a minimum freeboard of 12 inches. Remove and dispose of hardened concrete and return the structure to a functional condition after reaching 75% capacity.

Inspect concrete washout structures for damage and maintain for effectiveness.

Remove the concrete washout structures and sign upon project completion. Grade the earth material to match the existing contours and permanently seed and mulch area.

Measurement and Payment

Concrete Washout Structure will be paid for per each enclosure installed in accordance with the details. If alternate details or commercially available devices are approved, then those devices will also be paid for per each approved and installed device.

Temporary Silt Fence will be measured and paid for in accordance with Article 1605-5 of the Standard Specifications.

Safety Fence shall be measured and paid for as provided elsewhere in this contract.

No measurement will be made for other items or for over excavation or stockpiling.

Payment will be made under:

Pay Item Pay Unit

Concrete Washout Structure Each

FABRIC INSERT INLET PROTECTION DEVICE (HIGH FLOW)

(6-29-17)

Description

This work shall consist of installing, maintaining, and removing *Fabric Insert Inlet Protection Device*, of the type specified, in inlet structures (catch basins, drop inlets, etc) in areas where asphalt or concrete may prevent the proper installation of a Rock Inlet Sediment Traps Type C, or as directed.

Materials

The product shall be a fabric inlet protection device composed of a fitted woven polypropylene geotextile double sewn with nylon thread suspended sack. The *Fabric Insert Inlet Protection Device* shall be manufactured to fit the opening of the catch basin or drop inlet or shall have a deflector to direct runoff from the curb opening into the fabric sack. The *Fabric Insert Inlet Protection Device* shall have a rigid frame or support system to support the loaded weight of the product. The product shall have lifting loops for removing the device from the basin and will have dump straps attached at the bottom to facilitate the emptying of the device. The *Fabric Insert Inlet Protection Device* shall have an overflow system to allow stormwater to enter the inlet structure and avoid ponding on the roadway when the device reaches capacity.

The stitching shall meet the following physical properties:

Physical	Test Method	English
Average Wide Width Strength	ASTM D-4884	165 lb/in

The fitted filter assembly shall have the following physical properties:

Physical	Test Method	English
Grab Tensile	ASTM D-4632	255 x 275 lbs
Minimum Puncture Strength	ASTM D-4833	125 lbs
Mullen Burst	ASTM D-3786	420 PSI
Minimum UV Resistance	ASTM D-4355	70 %.
Flow Rate	ASTM D-4491	200 gal/min/ft ²
Apparent Opening	ASTM D-4751	20 US Sieve
Permittivity	ASTM D-4491	1.5 sec ⁻¹

Construction Methods

Strictly comply with manufacturer's installation instructions and recommendations. Maintenance shall include regular daily inspections and after each qualifying rain event. The *Fabric Insert Inlet Protection Device* shall be emptied, cleaned and placed back into the basin when it reaches 50% capacity or as directed.

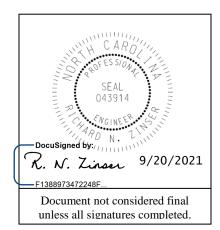
Measurement and Payment

This work will be paid for at the contract unit price per *Fabric Insert Inlet Protection Device* of the type specified, complete in place and accepted. Such payment shall be full compensation for furnishing and installing the *Fabric Insert Inlet Protection Device* in accordance with this specification and for all required maintenance.

Maintenance of the device, cleanout and disposal of accumulated sediments shall be paid for by *Fabric Insert Inlet Protection Device Cleanout*.

Payment will be made under:

Pay Item	Pay Unit
Fabric Insert Inlet Protection Device	Each
Fabric Insert Inlet Protection Device Cleanout	Each



Signals and Intelligent Transportation Systems Project Special Provisions (Version 18.5)

Prepared By: RNZ 20-Sep-21

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1. 2018 STANDARD SPECIFICATIONS FOR ROADS & STRUCTURES

The 2018 Standard Specifications are revised as follows:

1.1. GENERAL REQUIREMENTS – Construction Methods (1700-3(K))

Page 17-4, revise sentence starting on line 14 to read "Modify existing electrical services, as necessary, to meet the grounding requirements of the NEC, these *Standard Specifications, Standard Drawings*, and the project plans."

Page 17-4, revise sentence beginning on line 21 to read "Furnish and install additional ground rods to grounding electrode system as necessary to meet the *Standard Specifications*, *Standard Drawings*, and test requirements."

1.2. GENERAL REQUIREMENTS – Construction Methods (1700-3(M))

Page 17-4, Replace the sentence beginning on line 41 with "Prior to placing signal in the steady (stop-and-go) mode, the signal should be placed in the flashing mode for up to 7 days or as directed by the Engineer. The signal should not be placed in the steady (stop-and-go) mode on a Saturday or Sunday without prior approval from the Engineer. Do not place the signal in steady (stop-and-go) mode until inspected and without the prior approval of the Engineer."

1.3. WOOD POLES – Construction Methods (1720-3)

Page 17-18, revise sentence starting on line 13 to read "On new Department-owned poles, install a grounding system consisting of #6 AWG solid bare copper wire that is mechanically crimped using an irreversible compression tool with die to a single ground rod installed at base of pole or to the electrical service grounding electrode system located within 10 feet of the pole."

2. SIGNAL HEADS

2.1. MATERIALS

A. General:

Fabricate vehicle signal head housings and end caps from die-cast aluminum. Fabricate 12-inch and 16-inch pedestrian signal head housings and end caps from die-cast aluminum. Fabricate 9-inch pedestrian signal head housings, end caps, and visors from virgin polycarbonate material. Provide visor mounting screws, door latches, and hinge pins fabricated from stainless steel. Provide interior screws, fasteners, and metal parts fabricated from stainless steel.

Fabricate tunnel and traditional visors from sheet aluminum.

Paint all surfaces inside and outside of signal housings and doors. Paint outside surfaces of tunnel and traditional visors, wire outlet bodies, wire entrance fitting brackets and end caps when supplied as components of messenger cable mounting assemblies, pole and pedestal mounting assemblies, and pedestrian pushbutton housings. Have electrostatically-applied, fused-polyester paint in highway yellow (Federal Standard 595C, Color Chip Number 13538) a minimum of 2.5 to 3.5 mils thick. Do not apply paint to the latching hardware, rigid vehicle signal head mounting brackets for mast-arm attachments, messenger cable hanger components or balance adjuster components.

Have the interior surfaces of tunnel and traditional visors painted an alkyd urea black synthetic baking enamel with a minimum gloss reflectance and meeting the requirements of MIL-E-10169, "Enamel Heat Resisting, Instrument Black."

Where required, provide polycarbonate signal heads and visors that comply with the provisions pertaining to the aluminum signal heads listed on the QPL with the following exceptions:

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Fabricate signal head housings, end caps, and visors from virgin polycarbonate material. Provide UV stabilized polycarbonate plastic with a minimum thickness of 0.1 ± 0.01 inches that is highway yellow (Federal Standard 595C, Color Chip 13538). Ensure the color is incorporated into the plastic material before molding the signal head housings and end caps. Ensure the plastic formulation provides the following physical properties in the assembly (tests may be performed on separately molded specimens):

Test	Required	Method
Specific Gravity	1.17 minimum	ASTM D 792
Flammability	Self-extinguishing	ASTM D 635
Tensile Strength, yield, PSI	8500 minimum	ASTM D 638
Izod impact strength, ft-lb/in [notched, 1/8 inch]	12 minimum	ASTM D 256

For pole mounting, provide side of pole mounting assemblies with framework and all other hardware necessary to make complete, watertight connections of the signal heads to the poles and pedestals. Fabricate the mounting assemblies and frames from aluminum with all necessary hardware, screws, washers, etc. to be stainless steel. Provide mounting fittings that match the positive locking device on the signal head with the serrations integrally cast into the brackets. Provide upper and lower pole plates that have a 1 ¼-inch vertical conduit entrance hubs with the hubs capped on the lower plate and 1 ½-inch horizontal hubs. Ensure that the assemblies provide rigid attachments to poles and pedestals so as to allow no twisting or swaying of the signal heads. Ensure that all raceways are free of sharp edges and protrusions, and can accommodate a minimum of ten Number 14 AWG conductors.

For pedestal mounting, provide a post-top slipfitter mounting assembly that matches the positive locking device on the signal head with serrations integrally cast into the slipfitter. Provide stainless steel hardware, screws, washers, etc. Provide a minimum of six 3/8 X 3/4-inch long square head bolts for attachment to pedestal. Provide a center post for multi-way slipfitters.

For light emitting diode (LED) traffic signal modules, provide the following requirements for inclusion on the Department's Qualified Products List for traffic signal equipment.

- 1. Sample submittal,
- 2. Third-party independent laboratory testing results for each submitted module with evidence of testing and conformance with all of the Design Qualification Testing specified in section 6.4 of each of the following Institute of Transportation Engineers (ITE) specifications:
 - Vehicle Traffic Control Signal Heads Light Emitting Diode (LED) Circular Signal Supplement
 - Vehicle Traffic Control Signal Heads Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement
 - Pedestrian Traffic Control Signal Indications –Light Emitting Diode (LED) Signal Modules.

(Note: The Department currently recognizes two approved independent testing laboratories. They are Intertek ETL Semko and Light Metrics, Incorporated with Garwood Laboratories. Independent laboratory tests from other laboratories may be considered as part of the QPL submittal at the discretion of the Department,

3. Evidence of conformance with the requirements of these specifications,

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- 4. A manufacturer's warranty statement in accordance with the required warranty, and
- 5. Submittal of manufacturer's design and production documentation for the model, including but not limited to, electrical schematics, electronic component values, proprietary part numbers, bill of materials, and production electrical and photometric test parameters.
- 6. Evidence of approval of the product to bear the Intertek ETL Verified product label for LED traffic signal modules.

In addition to meeting the performance requirements for the minimum period of 60 months, provide a written warranty against defects in materials and workmanship for the modules for a period of 60 months after installation of the modules. During the warranty period, the manufacturer must provide new replacement modules within 45 days of receipt of modules that have failed at no cost to the State. Repaired or refurbished modules may not be used to fulfill the manufacturer's warranty obligations. Provide manufacturer's warranty documentation to the Department during evaluation of product for inclusion on Qualified Products List (QPL).

B. Vehicle Signal Heads:

Comply with the ITE standard "Vehicle Traffic Control Signal Heads". Provide housings with provisions for attaching backplates.

Provide visors that are 8 inches in length for 8-inch vehicle signal head sections. Provide visors that are 10 inches in length for 12-inch vehicle signal heads.

Provide a termination block with one empty terminal for field wiring for each indication plus one empty terminal for the neutral conductor. Have all signal sections wired to the termination block. Provide barriers between the terminals that have terminal screws with a minimum Number 8 thread size and that will accommodate and secure spade lugs sized for a Number 10 terminal screw.

Mount termination blocks in the yellow signal head sections on all in-line vehicle signal heads. Mount the termination block in the red section on five-section vehicle signal heads.

Furnish vehicle signal head interconnecting brackets. Provide one-piece aluminum brackets less than 4.5 inches in height and with no threaded pipe connections. Provide hand holes on the bottom of the brackets to aid in installing wires to the signal heads. Lower brackets that carry no wires and are used only for connecting the bottom signal sections together may be flat in construction.

For messenger cable mounting, provide messenger cable hangers, wire outlet bodies, balance adjusters, bottom caps, wire entrance fitting brackets, and all other hardware necessary to make complete, watertight connections of the vehicle signal heads to the messenger cable. Fabricate messenger cable hanger components, wire outlet bodies and balance adjuster components from stainless steel or malleable iron galvanized in accordance with ASTM A153 (Class A) or ASTM A123. Provide serrated rings made of aluminum. Provide messenger cable hangers with U-bolt clamps. Fabricate washers, screws, hex-head bolts and associated nuts, clevis pins, cotter pins, U-bolt clamps and nuts from stainless steel.

For mast-arm mounting, provide rigid vehicle signal head mounting brackets and all other hardware necessary to make complete, watertight connections of the vehicle signal heads to the mast arms and to provide a means for vertically adjusting the vehicle signal heads to proper alignment. Fabricate the mounting assemblies from aluminum, and provide serrated rings made of aluminum. Provide stainless steel cable attachment assemblies to secure the brackets to the mast arms. Ensure all fastening hardware and fasteners are fabricated from stainless steel.

Provide LED vehicular traffic signal modules (hereafter referred to as modules) that consist of an assembly that uses LEDs as the light source in lieu of an incandescent lamp for use in traffic signal

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sections. Use LEDs that are aluminum indium gallium phosphorus (AlInGaP) technology for red and yellow indications and indium gallium nitride (InGaN) for green indications. Install the ultra bright type LEDs that are rated for 100,000 hours of continuous operation from -40° F to $+165^{\circ}$ F. Design modules to have a minimum useful life of 60 months and to meet all parameters of this specification during this period of useful life.

For the modules, provide spade terminals crimped to the lead wires and sized for a #10 screw connection to the existing terminal block in a standard signal head. Do not provide other types of crimped terminals with a spade adapter.

Ensure the power supply is integral to the module assembly. On the back of the module, permanently mark the date of manufacture (month & year) or some other method of identifying date of manufacture.

Tint the red, yellow and green lenses to correspond with the wavelength (chromaticity) of the LED. Transparent tinting films are unacceptable. Provide a lens that is integral to the unit with a smooth outer surface.

1. LED Circular Signal Modules:

Provide modules in the following configurations: 12-inch circular sections, and 8-inch circular sections. All makes and models of LED modules purchased for use on the State Highway System shall appear on the current NCDOT Traffic Signal Qualified Products List (QPL).

Provide the manufacturer's model number and the product number (assigned by the Department) for each module that appears on the 2018 or most recent Qualified Products List. In addition, provide manufacturer's certification in accordance with Article 106-3 of the *Standard Specifications*, that each module meets or exceeds the ITE "Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement" dated June 27, 2005 (hereafter referred to as VTCSH Circular Supplement) and other requirements stated in this specification.

Provide modules that meet the following requirements when tested under the procedures outlined in the VTCSH Circular Supplement:

Module Type	Max. Wattage at 165° F	Nominal Wattage at 77° F
12-inch red circular	17	11
8-inch red circular	13	8
12-inch green circular	15	15
8-inch green circular	12	12

For yellow circular signal modules, provide modules tested under the procedures outlined in the VTCSH Circular Supplement to insure power required at 77° F is 22 Watts or less for the 12-inch circular module and 13 Watts or less for the 8-inch circular module.

Note: Use a wattmeter having an accuracy of $\pm 1\%$ to measure the nominal wattage and maximum wattage of a circular traffic signal module. Power may also be derived from voltage, current and power factor measurements.

2. LED Arrow Signal Modules

Provide 12-inch omnidirectional arrow signal modules. All makes and models of LED modules purchased for use on the State Highway System shall appear on the current NCDOT Traffic Signal Qualified Products List (QPL).

Provide the manufacturer's model number and the product number (assigned by the Department) for each module that appears on the 2018 or most recent Qualified Products List. In addition, provide

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manufacturer's certification in accordance with Article 106-3 of the *Standard Specifications*, that each module meets or exceeds the requirements for 12-inch omnidirectional modules specified in the ITE "Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement" dated July 1, 2007 (hereafter referred to as VTCSH Arrow Supplement) and other requirements stated in this specification.

Provide modules that meet the following requirements when tested under the procedures outlined in the VTCSH Arrow Supplement:

Module Type	Max. Wattage at 165° F	Nominal Wattage at 77° F
12-inch red arrow	12	9
12-inch green arrow	11	11

For yellow arrow signal modules, provide modules tested under the procedures outlined in the VTCSH Arrow Supplement to insure power required at 77° F is 12 Watts or less.

Note: Use a wattmeter having an accuracy of $\pm 1\%$ to measure the nominal wattage and maximum wattage of an arrow traffic signal module. Power may also be derived from voltage, current and power factor measurements.

3. LED U-Turn Arrow Signal Modules:

Provide modules in the following configurations: 12-inch left u-turn arrow signal modules and 12-inch right u-turn arrow signal modules.

Modules are not required to be listed on the ITS and Signals Qualified Products List. Provide manufacturer's certification in accordance with Article 106-3 of the *Standard Specifications*, that each module meets or exceeds the ITE "Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement" dated June 27, 2005 (hereafter referred to as VTCSH Circular Supplement) and other requirements stated in this specification.

Provide modules that have minimum maintained luminous intensity values that are not less than 16% of the values calculated using the method described in section 4.1 of the VTCSH Circular Supplement.

Provide modules that meet the following requirements when tested under the procedures outlined in the VTCSH Circular Supplement:

Module Type	Max. Wattage at 165° F	Nominal Wattage at 77° F
12-inch red u-turn arrow	17	11
12-inch green u-turn arrow	15	15

For yellow u-turn arrow signal modules, provide modules tested under the procedures outlined in the VTCSH Circular Supplement to ensure power required at 77° F is 22 Watts or less.

Note: Use a wattmeter having an accuracy of $\pm 1\%$ to measure the nominal wattage and maximum wattage of a circular traffic signal module. Power may also be derived from voltage, current and power factor measurements.

4. LED Bi-Modal Green-Yellow Arrow Signal Modules

Provide 12-inch omnidirectional bi-modal arrow signal modules. Ensure both green and yellow arrow indications are in each module with a clear lens that is integral to the unit. Ensure both indications display an incandescent style look.

Modules are not required to be listed on the ITS and Signals Qualified Products List. Ensure that both indications along with the module meet or exceed the requirements in sections 1, 2, 3, 4 and 5 of the VTCSH Arrow Supplement and other requirements stated in this specification.

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Provide modules that meet the following requirements when tested under the procedures outlined in the VTCSH Arrow Supplement:

Arrow Type	Nominal Wattage at 77° F
12-inch yellow arrow	12
12-inch green arrow	11

Note: Use a wattmeter having an accuracy of $\pm 1\%$ to measure the nominal wattage and maximum wattage of a circular traffic signal module. Power may also be derived from voltage, current and power factor measurements.

C. Pedestrian Signal Heads:

Provide pedestrian signal heads with international symbols that meet the MUTCD. Do not provide letter indications.

Comply with the ITE standard for "Pedestrian Traffic Control Signal Indications" and the following sections of the ITE standard for "Vehicle Traffic Control Signal Heads" in effect on the date of advertisement:

- Section 3.00 "Physical and Mechanical Requirements"
- Section 4.01 "Housing, Door, and Visor: General"
- Section 4.04 "Housing, Door, and Visor: Materials and Fabrication"
- Section 7.00 "Exterior Finish"

Provide a double-row termination block with three empty terminals and number 10 screws for field wiring. Provide barriers between the terminals that accommodate a spade lug sized for number 10 terminal screws. Mount the termination block in the hand section. Wire all signal sections to the terminal block.

Where required by the plans, provide 16-inch pedestrian signal heads with traditional three-sided, rectangular visors, 6 inches long. Where required by the plans, provide 12-inch pedestrian signal heads with traditional three-sided, rectangular visors, 8 inches long.

Provide 2-inch diameter pedestrian push-buttons with weather-tight housings fabricated from die-cast aluminum and threading in compliance with the NEC for rigid metal conduit. Provide a weep hole in the housing bottom and ensure that the unit is vandal resistant.

Provide push-button housings that are suitable for mounting on flat or curved surfaces and that will accept 1/2-inch conduit installed in the top. Provide units that have a heavy duty push-button assembly with a sturdy, momentary, normally-open switch. Have contacts that are electrically insulated from the housing and push-button. Ensure that the push-buttons are rated for a minimum of 5 mA at 24 volts DC and 250 mA at 12 volts AC.

Provide standard R10-3 signs with mounting hardware that comply with the MUTCD in effect on the date of advertisement. Provide R10-3E signs for countdown pedestrian heads and R10-3B for non-countdown pedestrian heads.

Design the LED pedestrian traffic signal modules (hereafter referred to as modules) for installation into standard pedestrian traffic signal sections that do not contain the incandescent signal section reflector, lens, eggcrate visor, gasket, or socket. Provide modules that consist of an assembly that uses LEDs as the light source in lieu of an incandescent lamp. Use LEDs that are of the latest aluminum indium gallium phosphorus (AlInGaP) technology for the Portland Orange hand and

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countdown displays. Use LEDs that are of the latest indium gallium nitride (InGaN) technology for the Lunar White walking man displays. Install the ultra-bright type LEDs that are rated for 100,000 hours of continuous operation from -40°F to +165°F. Design modules to have a minimum useful life of 60 months and to meet all parameters of this specification during this period of useful life.

Design all modules to operate using a standard 3 - wire field installation. Provide spade terminals crimped to the lead wires and sized for a #10 screw connection to the existing terminal block in a standard pedestrian signal housing. Do not provide other types of crimped terminals with a spade adapter.

Ensure the power supply is integral to the module assembly. On the back of the module, permanently mark the date of manufacture (month & year) or some other method of identifying date of manufacture.

Provide modules in the following configuration: 16-inch displays which have the solid hand/walking man overlay on the left and the countdown on the right, and 12-inch displays which have the solid hand/walking man module as an overlay. All makes and models of LED modules purchased for use on the State Highway System shall appear on the current NCDOT Traffic Signal Qualified Products List (QPL).

Provide the manufacturer's model number and the product number (assigned by the Department) for each module that appears on the 2018 or most recent Qualified Products List. In addition, provide manufacturer's certification in accordance with Article 106-3 of the *Standard Specifications*, that each module meets or exceeds the ITE "Pedestrian Traffic Control Signal Indicators - Light Emitting Diode (LED) Signal Modules" dated August 04, 2010 (hereafter referred to as PTCSI Pedestrian Standard) and other requirements stated in this specification.

Provide modules that meet the following requirements when tested under the procedures outlined in the PTCSI Pedestrian Standard:

Module Type	Max. Wattage at 165° F	Nominal Wattage at 77° F
Hand Indication	16	13
Walking Man Indication	12	9
Countdown Indication	16	13

Note: Use a wattmeter having an accuracy of $\pm 1\%$ to measure the nominal wattage and maximum wattage of a circular traffic signal module. Power may also be derived from voltage, current and power factor measurements.

Provide module lens that is hard coated or otherwise made to comply with the material exposure and weathering effects requirements of the Society of Automotive Engineers (SAE) J576. Ensure all exposed components of the module are suitable for prolonged exposure to the environment, without appreciable degradation that would interfere with function or appearance.

Ensure the countdown display continuously monitors the traffic controller to automatically learn the pedestrian phase time and update for subsequent changes to the pedestrian phase time.

Ensure the countdown display begins normal operation upon the completion of the preemption sequence and no more than one pedestrian clearance cycle.

D. Signal Cable:

Furnish 16-4 and 16-7 signal cable that complies with IMSA specification 20-1 except provide the following conductor insulation colors:

• For 16-4 cable: white, yellow, red, and green

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• For 16-7 cable: white, yellow, red, green, yellow with black stripe tracer, red with black stripe tracer, and green with black stripe tracer. Apply continuous stripe tracer on conductor insulation with a longitudinal or spiral pattern.

Provide a ripcord to allow the cable jacket to be opened without using a cutter. IMSA specification 19-1 will not be acceptable. Provide a cable jacket labeled with the IMSA specification number and provide conductors constructed of stranded copper.

3. CONTROLLERS WITH CABINETS

3.1. MATERIALS – TYPE 170E CONTROLLERS

Conform to the CALTRANS *Traffic Signal Control Equipment Specifications* and addendum 8, *Specifications for Model 170E Enhanced Controller Unit and Associated Model 412C and Model 172 Modules* except as required herein.

Provide model 412C Program Modules as defined in CALTRANS Addendum 8 except as specified otherwise herein. Provide program module delivery with Memory Select #4 Configuration except that all RAM must be DALLAS Non-volatile RAM or an approved equal. Ensure that the removal of the program module from the controller will place the intersection into flash.

Provide diagnostic software or removable diagnostic PROM modules that will test and diagnose the following:

- systems of the controller, including the internal memory, Program Module, Real Time Clock, I/O circuitry, display, and keyboard;
- systems of the cabinet, including the output file, input file, police panel, flashing operation, and cabinet switches; and
- systems of the conflict monitor by checking all possible conflicts in a logical sequence and resetting the conflict monitor each time, and by testing red failure function and red detect cable disconnects.

Ensure that the automatic reset function can be enabled by inserting a diagnostic plug in the jack labeled "Conflict Monitor Test" in the "TEST" position.

In addition to CALTRANS system communications capability between a central computer and master controller and master to local controller communications, provide communications capability with the intersection conflict monitor via an RS-232C/D port on the monitor. Ensure controller receives data from the conflict monitor through a controller Asynchronous Communications Interface Adapter (ACIA) determined by the controller software manufacturer. Ensure that with the appropriate software, the controller is capable of communicating directly through a laptop nine pin serial port to the same monitor RS-232C/D to retrieve all event log information.

Furnish a communications connecting cable with the following pin connections.

170		Conflict Monitor DB-9
RX pin L	Connect to	TX pin 2
TX pin K	Connect to	RX pin 3
+5 pin D	Connect to	DTR pin 4
GND pin N	Connect to	GND pin 5

Provide a male DB-9 connector on the cable for connection to the monitor.

Provide socket mounting for through-hole mount devices with 14 or more pins. Ensure that all sockets are AUGAT-500 series machined sockets, or equal.

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Provide a moisture resistant coating on all circuit boards. Mount circuit boards vertically.

3.2.MATERIALS – GENERAL CABINETS

Provide a moisture resistant coating on all circuit boards.

Provide one 20 mm diameter radial lead UL-recognized metal oxide varistor (MOV) between each load switch field terminal and equipment ground. Electrical performance is outlined below.

PROPERTIES OF MOV SURGE PROTECTOR					
Maximum Continuous Applied Voltage at	150 VAC (RMS)				
185° F	200 VDC				
Maximum Peak 8x20µs Current at 185° F	6500 A				
Maximum Energy Rating at 185° F	80 J				
Voltage Range 1 mA DC Test at 77° F	212-268 V				
Max. Clamping Voltage 8x20µs, 100A at 77° F	395 V				
Typical Capacitance (1 MHz) at 77° F	1600 pF				

Provide a power line surge protector that is a two-stage device that will allow connection of the radio frequency interference filter between the stages of the device. Ensure that a maximum continuous current is at least 10A at 120V. Ensure that the device can withstand a minimum of 20 peak surge current occurrences at 20,000A for an 8x20 microsecond waveform. Provide a maximum clamp voltage of 395V at 20,000A with a nominal series inductance of 200µh. Ensure that the voltage does not exceed 395V. Provide devices that comply with the following:

Frequency (Hz)	Minimum Insertion Loss (dB)
60	0
10,000	30
50,000	55
100,000	50
500,000	50
2,000,000	60
5,000,000	40
10,000,000	20
20,000,000	25

3.3. MATERIALS – TYPE 170E CABINETS

A. Type 170 E Cabinets General:

Conform to the city of Los Angeles' Specification No. 54-053-08, *Traffic Signal Cabinet Assembly Specification* (dated July 2008), except as required herein.

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Furnish model 336S pole mounted cabinets configured for 8 vehicle phases, 4 pedestrian phases, and 6 overlaps. Do not reassign load switches to accommodate overlaps unless shown on electrical details. Provide 336S pole mounted cabinets that are 46" high with 40" high internal rack assemblies.

Furnish model 332 base mounted cabinets configured for 8 vehicle phases, 4 pedestrian phases, and 6 overlaps. When overlaps are required, provide auxiliary output files for the overlaps. Do not reassign load switches to accommodate overlaps unless shown on electrical details.

Provide model 200 load switches, model 222 loop detector sensors, model 252 AC isolators, and model 242 DC isolators according to the electrical details. As a minimum, provide one (1) model 2018 conflict monitor, one (1) model 206L power supply unit, two (2) model 204 flashers, one (1) DC isolator (located in slot I14), and four (4) model 430 flash transfer relays (provide seven (7) model 430 flash transfer relays if auxiliary output file is installed) with each cabinet.

B. Type 170 E Cabinet Electrical Requirements:

Provide a cabinet assembly designed to ensure that upon leaving any cabinet switch or conflict monitor initiated flashing operation, the controller starts up in the programmed start up phases and start up interval.

Furnish two sets of non-fading cabinet wiring diagrams and schematics in a paper envelope or container and placed in the cabinet drawer.

All AC+ power is subject to radio frequency signal suppression.

Provide surge suppression in the cabinet for each type of cabinet device. Provide surge protection for the full capacity of the cabinet input file. Provide surge suppression devices that operate properly over a temperature range of -40° F to $+185^{\circ}$ F. Ensure the surge suppression devices provide both common and differential modes of protection.

Provide a pluggable power line surge protector that is installed on the back of the PDA (power distribution assembly) chassis to filter and absorb power line noise and switching transients. Ensure the device incorporates LEDs for failure indication and provides a dry relay contact closure for the purpose of remote sensing. Ensure the device meets the following specifications:

Peak Surge Current (Single pulse, 8x20μs)	20,000A
Occurrences (8x20µs waveform)	10 minimum @ 20,000A
Maximum Clamp Voltage	395VAC
Operating Current.	15 amps
Response Time	< 5 nanoseconds

Provide a loop surge suppressor for each set of loop terminals in the cabinet. Ensure the device meets the following specifications:

(Differential Mode @400A)	35V
(Common Mode @1,000A)	35V
Response Time	< 5 nanoseconds
Maximum Capacitance	35 pF

Provide a data communications surge suppressor for each communications line entering or leaving the cabinet. Ensure the device meets the following specifications:

Peak Surge Current (Single pulse, 8x20µs)	10,000A
Occurrences (8x20µs waveform)	100 min @ 2,000A
Maximum Clamp Voltage	Rated for equipment protected
Response Time	< 1 nanosecond
Maximum Capacitance	.1,500 pF
Maximum Series Resistance	15Ω

Provide a DC signal surge suppressor for each DC input channel in the cabinet. Ensure the device meets the following specifications:

Peak Surge Current (Single pulse, 8x20μs)	10,000A
Occurrences (8x20µs waveform)	100 @ 2,000A
Maximum Clamp Voltage	30V
Response Time	< 1 nanosecond

Provide a 120 VAC signal surge suppressor for each AC+ interconnect signal input. Ensure the device meets the following specifications:

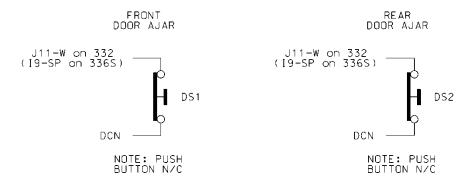
Peak Surge Current (Single pulse, 8x20μs)	20,000A
Maximum Clamp Voltage	350VAC
Response Time	< 200 nanoseconds
Discharge Voltage	<200 Volts @ 1,000A
Insulation Resistance	≥100 MΩ

Provide conductors for surge protection wiring that are of sufficient size (ampacity) to withstand maximum overcurrents which could occur before protective device thresholds are attained and current flow is interrupted.

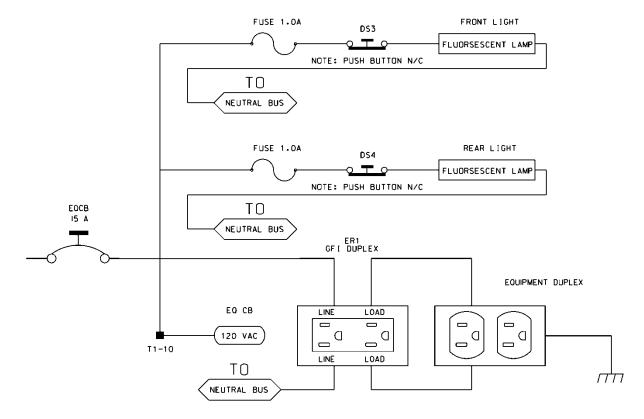
If additional surge protected power outlets are needed to accommodate fiber transceivers, modems, etc., install a UL listed, industrial, heavy-duty type power outlet strip with a minimum rating of 15~A / 125~VAC, 60~Hz. Provide a strip that has a minimum of 3 grounded outlets. Ensure the power outlet strip plugs into one of the controller unit receptacles located on the rear of the PDA. Ensure power outlet strip is mounted securely; provide strain relief if necessary.

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Provide a door switch in the front and a door switch in the rear of the cabinet that will provide the controller unit with a Door Ajar alarm when either the front or the rear door is open. Ensure the door switches apply DC ground to the Input File when either the front door or the rear door is open.



Furnish a fluorescent fixture in the rear across the top of the cabinet and another fluorescent fixture in the front across the top of the cabinet at a minimum. Ensure that the fixtures provide sufficient light to illuminate all terminals, labels, switches, and devices in the cabinet. Conveniently locate the fixtures so as not to interfere with a technician's ability to perform work on any devices or terminals in the cabinet. Provide a protective diffuser to cover exposed bulbs. Install 16 watt T-4 lamps in the fluorescent fixtures. Provide a door switch to provide power to each fixture when the respective door is open. Wire the fluorescent fixtures to the 15 amp ECB (equipment circuit breaker).



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Furnish a police panel with a police panel door. For model 336S cabinets, mount the police panel on the rear door. Ensure that the police panel door permits access to the police panel when the main door is closed. Ensure that no rainwater can enter the cabinet even with the police panel door open. Provide a police panel door hinged on the right side as viewed from the front. Provide a police panel door lock that is keyed to a standard police/fire call box key. In addition to the requirements of LA Specification No. 54-053-08, provide the police panel with a toggle switch connected to switch the intersection operation between normal stop-and-go operation (AUTO) and manual operation (MANUAL). Ensure that manual control can be implemented using inputs and software such that the controller provides full programmed clearance times for the yellow clearance and red clearance for each phase while under manual control.

Provide a 1/4-inch locking phone jack in the police panel for a hand control to manually control the intersection. Provide sufficient room in the police panel for storage of a hand control and cord. Ensure the 336S cabinet Input File is wired as follows:

				Po	ert-Bit		Cabine in Ass		ent					
Slot#	1	2	3	4	5	6	7	8	9	10	11	12	13	14
C-1 (Spares)	59	60	61	62	63	64	65	66	75	76	77	78	79	80
Port	3-2	1-1	3-4	1-3	3-1	1-2	3-3	1-4	2-5	5-5	5-6	5-1	5-2	6-7
C-1	56	39	58	41	55	40	57	42	51	71	72	67	68	81
Port	2-1	1-5	2-3	1-7	2-2	1-6	2-4	1-8	2-6	5-7	5-8	5-3	5-4	6-8
C-1	47	43	49	45	48	44	50	46	52	73	74	69	70	82

For model 332 base mounted cabinets, ensure terminals J14-E and J14-K are wired together on the rear of the Input File. Connect TB9-12 (J14 Common) on the Input Panel to T1-2 (AC-) on the rear of the PDA.

Provide detector test switches mounted at the top of the cabinet rack or other convenient location which may be used to place a call on each of eight phases based on the chart below. Provide three positions for each switch: On (place call), Off (normal detector operation), and Momentary On (place momentary call and return to normal detector operation after switch is released). Ensure that the switches are located such that the technician can read the controller display and observe the intersection.

Connect detector test switches for cabinets as follows:

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336S Cabinet	ţ	332 Cabinet		
Detector Call Switches	Terminals	Detector Call Switches	Terminals	
Phase 1	I1-F	Phase 1	I1-W	
Phase 2	I2-F	Phase 2	I4-W	
Phase 3	I3-F	Phase 3	I5-W	
Phase 4	I4-F	Phase 4	I8-W	
Phase 5	I5-F	Phase 5	J1-W	
Phase 6	I6-F	Phase 6	J4-W	
Phase 7	I7-F	Phase 7	J5-W	
Phase 8	I8-F	Phase 8	J8-W	

Provide the PCB 28/56 connector for the conflict monitor unit (CMU) with 28 independent contacts per side, dual-sided with 0.156 inch contact centers. Provide the PCB 28/56 connector contacts with solder eyelet terminations. Ensure all connections to the PCB 28/56 connector are soldered to the solder eyelet terminations.

Ensure that all cabinets have the CMU connector wired according to the 332 cabinet connector pin assignments (include all wires for auxiliary output file connection). Wire pins 13, 16, R, and U of the CMU connector to a separate 4 pin plug, P1, as shown below. Provide a second plug, P2, which will mate with P1 and is wired to the auxiliary output file as shown below. Provide an additional plug, P3, which will mate with P1 and is wired to the pedestrian yellow circuits as shown below. When no auxiliary output file is installed in the cabinet, provide wires for the green and yellow inputs for channels 11, 12, 17, and 18, the red inputs for channels 17 and 18, and the wires for the P2 plug. Terminate the two-foot wires with ring type lugs, insulated, and bundled for optional use.

_	P	1	P	2	P3		
PIN	FUNCTION	CONN TO	FUNCTION	CONN TO	FUNCTION	CONN TO	
1	CH-9G	CMU-13	OLA-GRN	A123	2P-YEL	114	
2	CH-9Y	CMU-16	OLA-YEL	A122	4P-YEL	105	
3	CH-10G	CMU-R	OLB-GRN	A126	6P-YEL	120	
4	CH-10Y	CMU-U	OLB-YEL	A125	8P-YEL	111	

Do not provide the P20 terminal assembly (red monitor board) or red interface ribbon cable as specified in LA Specification No. 54-053-08.

Provide a P20 connector that mates with and is compatible with the red interface connector mounted on the front of the conflict monitor. Ensure that the P20 connector and the red interface connector on the conflict monitor are center polarized to ensure proper connection. Ensure that removal of the P20 connector will cause the conflict monitor to recognize a latching fault condition and place the cabinet into flashing operation.

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Wire the P20 connector to the output file and auxiliary output file using 22 AWG stranded wires. Ensure the length of these wires is a minimum of 42 inches in length. Provide a durable braided sleeve around the wires to organize and protect the wires.

Wire the P20 connector to the traffic signal red displays to provide inputs to the conflict monitor as shown below. Ensure the pedestrian Don't Walk circuits are wired to channels 13 through 16 of the P20 connector. When no auxiliary output file is installed in the cabinet, provide wires for channels 9 through 12 reds. Provide a wire for special function 1. Terminate the unused wires with ring type lugs, insulated, and bundled for optional use.

	P20 Connector							
PIN	FUNCTION	CONN TO	PIN	FUNCTION	CONN TO			
1	Channel 15 Red	119	2	Channel 16 Red	110			
3	Channel 14 Red	104	4	Chassis GND	01-9			
5	Channel 13 Red	113	6	N/C				
7	Channel 12 Red	AUX 101	8	Spec Function 1				
9	Channel 10 Red	AUX 124	10	Channel 11 Red	AUX 114			
11	Channel 9 Red	AUX 121	12	Channel 8 Red	107			
13	Channel 7 Red	122	14	Channel 6 Red	134			
15	Channel 5 Red	131	16	Channel 4 Red	101			
17	Channel 3 Red	116	18	Channel 2 Red	128			
19	Channel 1 Red	125	20	Red Enable	01-14			

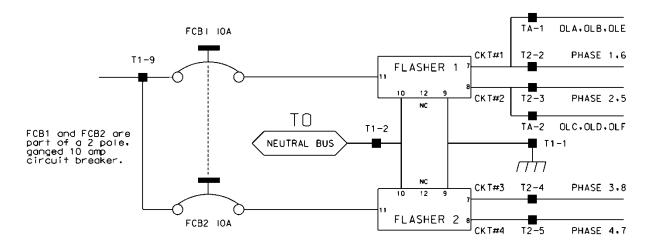
Ensure the controller unit outputs to the auxiliary output file are pre-wired to the C5 connector. When no auxiliary output file is installed in the cabinet, connect the C5 connector to a storage socket located on the Input Panel or on the rear of the PDA.

Do not wire pin 12 of the load switch sockets.

In addition to the requirements of LA Specification No. 54-053-08, ensure relay K1 on the Power Distribution Assembly (PDA) is a four pole relay and K2 on the PDA is a two pole relay.

Provide a two pole, ganged circuit breaker for the flash bus circuit. Ensure the flash bus circuit breaker is an inverse time circuit breaker rated for 10 amps at 120 VAC with a minimum of 10,000 RMS symmetrical amperes short circuit current rating. Do not provide the auxiliary switch feature on the flash bus circuit breaker. Ensure the ganged flash bus circuit breaker is certified by the circuit breaker manufacturer to provide gang tripping operation.

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Ensure auxiliary output files are wired as follows:

AUXILIARY OUTPUT FILE TERMINAL BLOCK TA ASSIGNMENTS				
POSITION	FUNCTION			
1	Flasher Unit #1, Circuit 1/FTR1 (OLA, OLB)/FTR3 (OLE)			
2	Flasher Unit #1, Circuit 2/FTR2 (OLC, OLD)/FTR3 (OLF)			
3	Flash Transfer Relay Coils			
4	AC -			
5	Power Circuit 5			
6	Power Circuit 5			
7	Equipment Ground Bus			
8	NC			

Provide four spare load resistors mounted in each cabinet. Ensure each load resistor is rated as shown in the table below. Wire one side of each load resistor to AC-. Connect the other side of each resistor to a separate terminal on a four (4) position terminal block. Mount the load resistors and terminal block either inside the back of Output File No. 1 or on the upper area of the Service Panel.

ACCEPTABLE LOAD RESISTOR VALUES		
VALUE (ohms)	WATTAGE	
1.5K – 1.9 K	25W (min)	
2.0K – 3.0K	10W (min)	

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Provide Model 200 load switches, Model 204 flashers, Model 242 DC isolators, Model 252 AC isolators, and Model 206L power supply units that conform to CALTRANS' "Transportation Electrical Equipment Specifications" dated March 12, 2009 with Erratum 1.

C. Type 170 E Cabinet Physical Requirements:

Do not mold, cast, or scribe the name "City of Los Angeles" on the outside of the cabinet door as specified in LA Specification No. 54-053-08. Do not provide a Communications Terminal Panel as specified in LA Specification No. 54-053-08. Do not provide terminal block TBB on the Service Panel. Do not provide Cabinet Verification Test Program software or associated test jigs as specified in LA Specification No. 54-053-08.

Furnish unpainted, natural, aluminum cabinet shells. Ensure that all non-aluminum hardware on the cabinet is stainless steel or a Department approved non-corrosive alternate.

Ensure the lifting eyes, gasket channels, police panel, and all supports welded to the enclosure and doors are fabricated from 0.125 inch minimum thickness aluminum sheet and meet the same standards as the cabinet and doors.

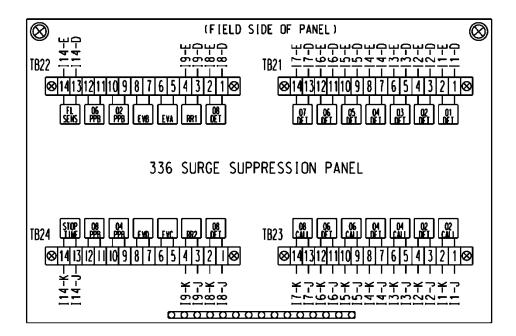
Provide front and rear doors with latching handles that allow padlocking in the closed position. Furnish 0.75 inch minimum diameter stainless steel handles with a minimum 0.5 inch shank. Place the padlocking attachment at 4.0 inches from the handle shank center to clear the lock and key. Provide an additional 4.0 inches minimum gripping length.

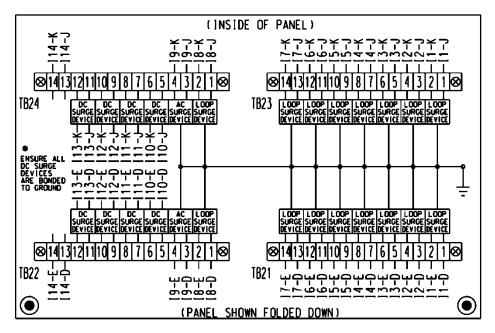
Provide Corbin #2 locks on the front and rear doors. Provide one (1) Corbin #2 and one (1) police master key with each cabinet. Ensure main door locks allow removal of keys in the locked position only.

Provide a surge protection panel with 16 loop surge protection devices and designed to allow sufficient free space for wire connection/disconnection and surge protection device replacement. For model 332 cabinets, provide an additional 20 loop surge protection devices. Provide an additional two AC+ interconnect surge devices to protect one slot and eight DC surge protection devices to protect four slots. Provide no protection devices on slot I14.

For pole mounted cabinets, mount surge protection devices for the AC+ interconnect inputs, inductive loop detector inputs, and low voltage DC inputs on a swing down panel assembly fabricated from sturdy aluminum. Attach the swing down panel to the bottom rear cabinet rack assembly using thumb screws. Ensure the swing down panel allows for easy removal of the input file without removing the surge protection panel assembly or its parts. Have the surge protection devices mounted horizontally on the panel and soldered to the feed through terminals of four 14 position terminal blocks with #8 screws mounted on the other side. Ensure the top row of terminals is connected to the upper slots and the bottom row of terminals is connected to the bottom slots. Provide a 15 position copper equipment ground bus attached to the field terminal side (outside) of the swing down panel for termination of loop lead-in shield grounds. Ensure that a Number 4 AWG green wire connects the surge protection panel assembly ground bus to the main cabinet equipment ground.

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For base mounted cabinets, mount surge protection panels on the left side of the cabinet as viewed from the rear. Attach each panel to the cabinet rack assembly using bolts and make it easily removable. Mount the surge protection devices in vertical rows on each panel and connect the devices to one side of 12 position, double row terminal blocks with #8 screws. For each surge protection panel, terminate all grounds from the surge protection devices on a copper equipment ground bus attached to the surge protection panel. Wire the terminals to the rear of a standard input file using spade lugs for input file protection.

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Provide permanent labels that indicate the slot and the pins connected to each terminal that may be viewed from the rear cabinet door. Label and orient terminals so that each pair of inputs is next to each other. Indicate on the labeling the input file (I or J), the slot number (1-14) and the terminal pins of the input slots (either D & E for upper or J & K for lower).

Provide a minimum 14 x 16 inch pull out, hinged top shelf located immediately below controller mounting section of the cabinet. Ensure the shelf is designed to fully expose the table surface outside the controller at a height approximately even with the bottom of the controller. Ensure the shelf has a storage bin interior which is a minimum of 1 inch deep and approximately the same dimensions as the shelf. Provide an access to the storage area by lifting the hinged top of the shelf. Fabricate the shelf and slide from aluminum or stainless steel and ensure the assembly can support the 2070L controller plus 15 pounds of additional weight. Ensure shelf has a locking mechanism to secure it in the fully extended position and does not inhibit the removal of the 2070L controller or removal of cards inside the controller when fully extended. Provide a locking mechanism that is easily released when the shelf is to be returned to its non-use position directly under the controller.

D. Model 2018 Enhanced Conflict Monitor:

Furnish Model 2018 Enhanced Conflict Monitors that provide monitoring of 18 channels. Ensure each channel consists of a green, yellow, and red field signal input. Ensure that the conflict monitor meets or exceeds CALTRANS' Transportation Electrical Equipment Specifications dated March 12, 2009, with Erratum 1 (hereafter referred to as CALTRANS' 2009 TEES) for a model 210 monitor unit and other requirements stated in this specification.

Ensure the conflict monitor is provided with an 18 channel conflict programming card. Pin EE and Pin T of the conflict programming card shall be connected together. Pin 16 of the conflict programming card shall be floating. Ensure that the absence of the conflict programming card will cause the conflict monitor to trigger (enter into fault mode), and remain in the triggered state until the programming card is properly inserted and the conflict monitor is reset.

Provide a conflict monitor that incorporates LED indicators into the front panel to dynamically display the status of the monitor under normal conditions and to provide a comprehensive review of field inputs with monitor status under fault conditions. Ensure that the monitor indicates the channels that were active during a conflict condition and the channels that experienced a failure for all other per channel fault conditions detected. Ensure that these indications and the status of each channel are retained until the Conflict Monitor is reset. Furnish LED indicators for the following:

- AC Power (Green LED indicator)
- VDC Failed (Red LED indicator)
- WDT Error (Red LED indicator)
- Conflict (Red LED indicator)
- Red Fail (Red LED indicator)
- Dual Indication (Red LED indicator)
- Yellow/Clearance Failure (Red LED indicator)
- PCA/PC Ajar (Red LED indicator)
- Monitor Fail/Diagnostic Failure (Red LED indicator)
- 54 Channel Status Indicators (1 Red, 1 Yellow, and 1 Green LED indicator for each of the 18 channels)

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Provide a switch to set the Red Fail fault timing. Ensure that when the switch is in the ON position the Red Fail fault timing value is set to 1350 +/- 150 ms (2018 mode). Ensure that when the switch is in the OFF position the Red Fail fault timing value is set to 850 +/- 150 ms (210 mode).

Provide a switch to set the Watchdog fault timing. Ensure that when the switch is in the ON position the Watchdog fault timing value is set to 1.0 + - 0.1 s (2018 mode). Ensure that when the switch is in the OFF position the Watchdog fault timing value is set to 1.5 + - 0.1 s (210 mode).

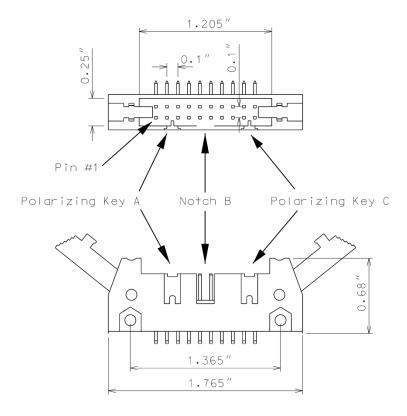
Provide a jumper or switch to set the AC line brown-out levels. Ensure that when the jumper is present or the switch is in the ON position the AC line dropout voltage threshold is $98 \pm 2 \text{ Vrms}$, the AC line restore voltage threshold is $103 \pm 2 \text{ Vrms}$, and the AC line brown-out timing value is set to $400 \pm 50 \text{ ms}$ (2018 mode). Ensure that when the jumper is not present or the switch is in the OFF position the AC line dropout voltage threshold is $92 \pm 2 \text{ Vrms}$, the AC line restore voltage threshold is $98 \pm 2 \text{ Vrms}$, and the AC line brown-out timing value is set to $80 \pm 10 \text{ Jrms}$ (210 mode).

Provide a jumper or switch that will enable and disable the Watchdog Latch function. Ensure that when the jumper is not present or the switch is in the OFF position the Watchdog Latch function is disabled. In this mode of operation, a Watchdog fault will be reset following a power loss, brownout, or power interruption. Ensure that when the jumper is present or the switch is in the ON position the Watchdog Latch function is enabled. In this mode of operation, a Watchdog fault will be retained until a Reset command is issued.

Provide a jumper that will reverse the active polarity for pin #EE (output relay common). Ensure that when the jumper is not present pin #EE (output relay common) will be considered 'Active' at a voltage greater than 70 Vrms and 'Not Active' at a voltage less than 50 Vrms (Caltrans mode). Ensure that when the jumper is present pin #EE (output relay common) will be considered 'Active' at a voltage less than 50 Vrms and 'Not Active' at a voltage greater than 70 Vrms (Failsafe mode).

In addition to the connectors required by CALTRANS' 2009 TEES, provide the conflict monitor with a red interface connector mounted on the front of the monitor. Ensure the connector is a 20 pin, right angle, center polarized, male connector with latching clip locks and polarizing keys. Ensure the right angle solder tails are designed for a 0.062" thick printed circuit board. Keying of the connector shall be between pins 3 and 5, and between 17 and 19. Ensure the connector has two rows of pins with the odd numbered pins on one row and the even pins on the other row. Ensure the connector pin row spacing is 0.10" and pitch is 0.10". Ensure the mating length of the connector pins is 0.24". Ensure the pins are finished with gold plating 30µ" thick.

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Ensure the red interface connector pins on the monitor have the following functions:

Pin #	Function	Pin #	Function
1	Channel 15 Red	2	Channel 16 Red
3	Channel 14 Red	4	Chassis Ground
5	Channel 13 Red	6	Special Function 2
7	Channel 12 Red	8	Special Function 1
9	Channel 10 Red	10	Channel 11 Red
11	Channel 9 Red	12	Channel 8 Red
13	Channel 7 Red	14	Channel 6 Red
15	Channel 5 Red	16	Channel 4 Red
17	Channel 3 Red	18	Channel 2 Red
19	Channel 1 Red	20	Red Enable

Ensure that removal of the P20 cable connector will cause the conflict monitor to recognize a latching fault condition and place the cabinet into flashing operation.

Provide Special Function 1 and Special Function 2 inputs to the unit which shall disable only Red Fail Monitoring when either input is sensed active. A Special Function input shall be sensed active when the input voltage exceeds 70 Vrms with a minimum duration of 550 ms. A Special Function input shall be sensed not active when the input voltage is less than 50 Vrms or the duration is less

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than 250 ms. A Special Function input is undefined by these specifications and may or may not be sensed active when the input voltage is between 50 Vrms and 70 Vrms or the duration is between 250 ms and 550 ms.

Ensure the conflict monitor recognizes field signal inputs for each channel that meet the following requirements:

- consider a Red input greater than 70 Vrms and with a duration of at least 500 ms as an "on" condition;
- consider a Red input less than 50 Vrms or with a duration of less than 200 ms as an "off" condition (no valid signal);
- consider a Red input between 50 Vrms and 70 Vrms or with a duration between 200 ms and 500 ms to be undefined by these specifications;
- consider a Green or Yellow input greater than 25 Vrms and with a duration of at least 500 ms as an "on" condition;
- consider a Green or Yellow input less than 15 Vrms or with a duration of less than 200 ms as an "off" condition; and
- consider a Green or Yellow input between 15 Vrms and 25 Vrms or with a duration between 200 ms and 500 ms to be undefined by these specifications.

Provide a conflict monitor that recognizes the faults specified by CALTRANS' 2009 TEES and the following additional faults. Ensure the conflict monitor will trigger upon detection of a fault and will remain in the triggered (in fault mode) state until the unit is reset at the front panel or through the external remote reset input for the following failures:

- 1. **Red Monitoring or Absence of Any Indication (Red Failure):** A condition in which no "on" voltage signal is detected on any of the green, yellow, or red inputs to a given monitor channel. If a signal is not detected on at least one input (R, Y, or G) of a conflict monitor channel for a period greater than 1000 ms when used with a 170 controller and 1500 ms when used with a 2070 controller, ensure monitor will trigger and put the intersection into flash. If the absence of any indication condition lasts less than 700 ms when used with a 170 controller and 1200 ms when used with a 2070 controller, ensure conflict monitor will not trigger. Red fail monitoring shall be enabled on a per channel basis by the use of switches located on the conflict monitor. Have red monitoring occur when all of the following input conditions are in effect:
 - a) Red Enable input to monitor is active (Red Enable voltages are "on" at greater than 70 Vrms, off at less than 50 Vrms, undefined between 50 and 70 Vrms), and
 - b) Neither Special Function 1 nor Special Function 2 inputs are active.
 - c) Pin #EE (output relay common) is not active
- 2. Short/Missing Yellow Indication Fault (Clearance Error): Yellow indication following a green is missing or shorter than 2.7 seconds (with \pm 0.1-second accuracy). If a channel fails to detect an "on" signal at the Yellow input for a minimum of 2.7 seconds (\pm 0.1 second) following the detection of an "on" signal at a Green input for that channel, ensure that the monitor triggers and generates a clearance/short yellow error fault indication. Short/missing

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yellow (clearance) monitoring shall be enabled on a per channel basis by the use of switches located on the conflict monitor. This fault shall not occur when the channel is programmed for Yellow Inhibit, when the Red Enable signal is inactive or pin #EE (output relay common) is active.

- 3. **Dual Indications on the Same Channel:** In this condition, more than one indication (R,Y,G) is detected as "on" at the same time on the same channel. If dual indications are detected for a period greater than 500 ms, ensure that the conflict monitor triggers and displays the proper failure indication (Dual Ind fault). If this condition is detected for less than 200 ms, ensure that the monitor does not trigger. G-Y-R dual indication monitoring shall be enabled on a per channel basis by the use of switches located on the conflict monitor. G-Y dual indication monitoring shall be enabled for all channels by use of a switch located on the conflict monitor. This fault shall not occur when the Red Enable signal is inactive or pin #EE (output relay common) is active.
- 4. Configuration Settings Change: The configuration settings are comprised of (as a minimum) the permissive diode matrix, dual indication switches, yellow disable jumpers, any option switches, any option jumpers, and the Watchdog Enable switch. Ensure the conflict monitor compares the current configuration settings with the previous stored configuration settings on power-up, on reset, and periodically during operation. If any of the configuration settings are changed, ensure that the conflict monitor triggers and causes the program card indicator to flash. Ensure that configuration change faults are only reset by depressing and holding the front panel reset button for a minimum of three seconds. Ensure the external remote reset input does not reset configuration change faults.

Ensure the conflict monitor will trigger and the AC Power indicator will flash at a rate of $2 \text{ Hz} \pm 20\%$ with a 50% duty cycle when the AC Line voltage falls below the "drop-out" level. Ensure the conflict monitor will resume normal operation when the AC Line voltage returns above the "restore" level. Ensure the AC Power indicator will remain illuminated when the AC voltage returns above the "restore" level. Should an AC Line power interruption occur while the monitor is in the fault mode, then upon restoration of AC Line power, the monitor will remain in the fault mode and the correct fault and channel indicators will be displayed.

Provide a flash interval of at least 6 seconds and at most 10 seconds in duration following a power-up, an AC Line interruption, or a brownout restore. Ensure the conflict monitor will suspend all fault monitoring functions, close the Output relay contacts, and flash the AC indicator at a rate of 4 Hz \pm 20% with a 50% duty cycle during this interval. Ensure the termination of the flash interval after at least 6 seconds if the Watchdog input has made 5 transitions between the True and False state and the AC Line voltage is greater than the "restore" level. If the watchdog input has not made 5 transitions between the True and False state within 10 ± 0.5 seconds, the monitor shall enter a WDT error fault condition.

Ensure the conflict monitor will monitor an intersection with a minimum of four approaches using the four-section Flashing Yellow Arrow (FYA) vehicle traffic signal as outlined by the NCHRP 3-54 research project for protected-permissive left turn signal displays. Ensure the conflict monitor will operate in the FYA mode and FYAc (Compact) mode as specified below to monitor each channel pair for the following fault conditions: Conflict, Flash Rate Detection, Red Fail, Dual Indication, and

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Clearance. Provide a switch to select between the FYA mode and FYAc mode. Provide a switch to select each FYA phase movement for monitoring.

FYA mode

FYA Signal Head	Phase 1	Phase 3	Phase 5	Phase 7
Red Arrow	Channel 9 Red	Channel 10 Red	Channel 11 Red	Channel 12 Red
Yellow Arrow	Channel 9 Yellow	Channel 10 Yellow	Channel 11 Yellow	Channel 12 Yellow
Flashing Yellow Arrow	Channel 9 Green	Channel 10 Green	Channel 11 Green	Channel 12 Green
Green Arrow	Channel 1 Green	Channel 3 Green	Channel 5 Green	Channel 7 Green

FYAc mode

FYA Signal Head	Phase 1	Phase 3	Phase 5	Phase 7
Red Arrow	Channel 1 Red	Channel 3 Red	Channel 5 Red	Channel 7 Red
Yellow Arrow	Channel 1 Yellow	Channel 3 Yellow	Channel 5 Yellow	Channel 7 Yellow
Flashing Yellow Arrow	Channel 1 Green	Channel 3 Green	Channel 5 Green	Channel 7 Green
Green Arrow	Channel 9 Green	Channel 9 Yellow	Channel 10 Green	Channel 10 Yellow

If a FYA channel pair is enabled for FYA operation, the conflict monitor will monitor the FYA logical channel pair for the additional following conditions:

- 1. **Conflict:** Channel conflicts are detected based on the permissive programming jumpers on the program card. This operation remains unchanged from normal operation except for the solid Yellow arrow (FYA clearance) signal.
- 2. Yellow Change Interval Conflict: During the Yellow change interval of the Permissive Turn channel (flashing Yellow arrow) the conflict monitor shall verify that no conflicting channels to the solid Yellow arrow channel (clearance) are active. These conflicting channels shall be determined by the program card compatibility programming of the Permissive Turn channel (flashing Yellow arrow). During the Yellow change interval of the Protected Turn channel (solid Green arrow) the conflict monitor shall verify that no conflicting channels to the solid Yellow arrow channel (clearance) are active as determined by the program card compatibility programming of the Protected Turn channel (solid Green arrow).

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- 3. **Flash Rate Detection:** The conflict monitor unit shall monitor for the absence of a valid flash rate for the Permissive turn channel (flashing Yellow arrow). If the Permissive turn channel (flashing Yellow arrow) is active for a period greater than 1600 milliseconds, ensure the conflict monitor triggers and puts the intersection into flash. If the Permissive turn channel (flashing Yellow arrow) is active for a period less than 1400 milliseconds, ensure the conflict monitor does not trigger. Ensure the conflict monitor will remain in the triggered (in fault mode) state until the unit is reset at the front panel or through the external remote reset input. Provide a jumper or switch that will enable and disable the Flash Rate Detection function. Ensure that when the jumper is not present or the switch is in the OFF position the Flash Rate Detection function is enabled. Ensure that when the jumper is present or the switch is in the ON position the Flash Rate Detection function is disabled.
- 4. **Red Monitoring or Absence of Any Indication (Red Failure):** The conflict monitor unit shall detect a red failure if there is an absence of voltage on all four of the inputs of a FYA channel pair (RA, YA, FYA, GA).
- 5. **Dual Indications on the Same Channel:** The conflict monitor unit shall detect a dual indication if two or more inputs of a FYA channel pair (RA, YA, FYA, GA) are "on" at the same time.
- 6. **Short/Missing Yellow Indication Fault (Clearance Error):** The conflict monitor unit shall monitor the solid Yellow arrow for a clearance fault when terminating both the Protected Turn channel (solid Green arrow) interval and the Permissive Turn channel (flashing Yellow arrow) interval.

Ensure that the conflict monitor will log at least nine of the most recent events detected by the monitor in non-volatile EEPROM memory (or equivalent). For each event, record at a minimum the time, date, type of event, status of each field signal indication with RMS voltage, and specific channels involved with the event. Ensure the conflict monitor will log the following events: monitor reset, configuration, previous fault, and AC line. Furnish the signal sequence log that shows all channel states (Greens, Yellows, and Reds) and the Red Enable State for a minimum of 2 seconds prior to the current fault trigger point. Ensure the display resolution of the inputs for the signal sequence log is not greater than 50 ms.

For conflict monitors used within an Ethernet communications system, provide a conflict monitor with an Ethernet 10/100 Mbps, RJ-45 port for data communication access to the monitor by a local notebook computer and remotely via a workstation or notebook computer device connected to the signal system local area network. The Ethernet port shall be electrically isolated from the conflict monitor's electronics and shall provide a minimum of 1500 Vrms isolation. Integrate monitor with Ethernet network in cabinet. Provide software to retrieve the time and date from a network server in order to synchronize the on-board times between the conflict monitor and the controller. Furnish and install the following Windows based, graphic user interface software on workstations and notebook computers where the signal system client software is installed: 1) software to view and retrieve all event log information, 2) software that will search and display a list of conflict monitor IP addresses and IDs on the network, and 3) software to change the conflict monitor's network parameters such as IP address and subnet mask.

For non-Ethernet connected monitors, provide a RS-232C/D compliant port (DB-9 female connector) on the front panel of the conflict monitor in order to provide communications from the conflict monitor to the 170/2070 controller or to a Department-furnished laptop computer. Electrically isolate the port interface electronics from all monitor electronics, excluding Chassis Ground. Ensure that the controller can receive all event log information through a controller

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Asynchronous Communications Interface Adapter (Type 170E) or Async Serial Comm Module (2070). Furnish and connect a serial cable from the conflict monitor's DB-9 connector to Comm Port 1 of the 2070 controller. Ensure conflict monitor communicates with the controller. Provide a Windows based graphic user interface software to communicate directly through the same monitor RS-232C/D compliant port to retrieve and view all event log information to a Department-furnished laptop computer. The RS-232C/D compliant port on the monitor shall allow the monitor to function as a DCE device with pin connections as follows:

Conflict Monitor RS-232C/D (DB-9 Female) Pinout			
Pin Number	Function	I/O	
1	DCD	0	
2	TX Data	0	
3	RX Data	I	
4	DTR	I	
5	Ground	-	
6	DSR	0	
7	CTS	I	
8	RTS	0	
9	NC	-	

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MONITOR BOARD EDGE CONNECTOR			
Pin #	Function (Back Side)	Pin#	Function (Component Side)
1	Channel 2 Green	A	Channel 2 Yellow
2	Channel 13 Green	В	Channel 6 Green
3	Channel 6 Yellow	C	Channel 15 Green
4	Channel 4 Green	D	Channel 4 Yellow
5	Channel 14 Green	E	Channel 8 Green
6	Channel 8 Yellow	F	Channel 16 Green
7	Channel 5 Green	Н	Channel 5 Yellow
8	Channel 13 Yellow	J	Channel 1 Green
9	Channel 1 Yellow	K	Channel 15 Yellow
10	Channel 7 Green	L	Channel 7 Yellow
11	Channel 14 Yellow	M	Channel 3 Green
12	Channel 3 Yellow	N	Channel 16 Yellow
13	Channel 9 Green	P	Channel 17 Yellow
14	Channel 17 Green	R	Channel 10 Green
15	Channel 11 Yellow	S	Channel 11 Green
16	Channel 9 Yellow	T	Channel 18 Yellow
17	Channel 18 Green	U	Channel 10 Yellow
18	Channel 12 Yellow	V	Channel 12 Green
19	Channel 17 Red	W	Channel 18 Red
20	Chassis Ground	X	Not Assigned
21	AC-	Y	DC Common
22	Watchdog Timer	Z	External Test Reset
23	+24VDC	AA	+24VDC
24	Tied to Pin 25	BB	Stop Time (Output)
25	Tied to Pin 24	CC	Not Assigned
26	Not Assigned	DD	Not Assigned
27	Relay Output, Side #3, N.O.	EE	Relay Output,Side #2,Common
28	Relay Output, Side #1, N.C.	FF	AC+

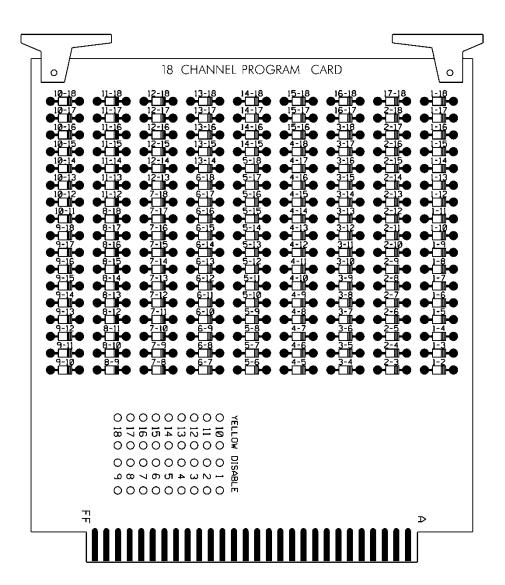
⁻⁻ Slotted for keying between Pins 17/U and 18/V

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	CONFLICT PROGRAM CARD PIN ASSIGNMENTS			
Pin #	Function (Back Side)	Pin #	Function (Component Side)	
1	Channel 2 Green	A	Channel 1 Green	
2	Channel 3 Green	В	Channel 2 Green	
3	Channel 4 Green	C	Channel 3 Green	
4	Channel 5 Green	D	Channel 4 Green	
5	Channel 6 Green	E	Channel 5 Green	
6	Channel 7 Green	F	Channel 6 Green	
7	Channel 8 Green	Н	Channel 7 Green	
8	Channel 9 Green	J	Channel 8 Green	
9	Channel 10 Green	K	Channel 9 Green	
10	Channel 11 Green	L	Channel 10 Green	
11	Channel 12 Green	M	Channel 11 Green	
12	Channel 13 Green	N	Channel 12 Green	
13	Channel 14 Green	P	Channel 13 Green	
14	Channel 15 Green	R	Channel 14 Green	
15	Channel 16 Green	S	Channel 15 Green	
16	N/C	T	PC AJAR	
17	Channel 1 Yellow	U	Channel 9 Yellow	
18	Channel 2 Yellow	V	Channel 10 Yellow	
19	Channel 3 Yellow	W	Channel 11 Yellow	
20	Channel 4 Yellow	X	Channel 12 Yellow	
21	Channel 5 Yellow	Y	Channel 13 Yellow	
22	Channel 6 Yellow	Z	Channel 14 Yellow	
23	Channel 7 Yellow	AA	Channel 15 Yellow	
24	Channel 8 Yellow	BB	Channel 16 Yellow	
25	Channel 17 Green	CC	Channel 17 Yellow	
26	Channel 18 Green	DD	Channel 18 Yellow	
27	Channel 16 Green	EE	PC AJAR (Program Card)	
28	Yellow Inhibit Common	FF	Channel 17 Green	

⁻⁻ Slotted for keying between Pins 24/BB and 25/CC

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3.4. MATERIALS – TYPE 170 DETECTOR SENSOR UNITS

Furnish detector sensor units that comply with Chapter 5 Section 1, "General Requirements," and Chapter 5 Section 2, "Model 222 & 224 Loop Detector Sensor Unit Requirements," of the CALTRANS "Transportation Electrical Equipment Specifications" dated March 12, 2009 with Erratum 1.

3.5. MATERIALS – TYPE 2070E CONTROLLERS

Furnish model 2070E controller units that conform to CALTRANS *Transportation Electrical Equipment Specifications* (TEES) (dated March 12, 2009, plus Errata 1 dated January 21, 2010 and Errata 2 dated December 5, 2014) except as required herein.

The Department will provide software at the beginning of the burning-in period. Contractor shall give 5 working days notice before needing software. Program software provided by the Department.

Provide model 2070E controllers with OS-9 release 1.3.1 or later with kernel edition #380 or later operating software and device drivers, composed of the unit chassis and at a minimum the following modules and assemblies:

1. MODEL 2070-1E, CPU Module, Single Board, with 8Mb Datakey (blue in color)

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- 2. MODEL 2070-2E+, Field I/O Module (FI/O)
 - 3. Note: Configure the Field I/O Module to disable both the External WDT Shunt/Toggle Switch and SP3 (SP3 active indicator is "off")
- 4. MODEL 2070-3B, Front Panel Module (FP), Display B (8x40)
- 5. MODEL 2070-4A, Power Supply Module, 10 AMP
- 6. MODEL 2070-7A, Async Serial Com Module (9-pin RS-232)

3.6. MEASUREMENT AND PAYMENT

Actual number of 2070E Controllers furnished and installed.

Payment will be made under:

2070E Controller Each

4. VIDEO IMAGING LOOP EMULATOR DETECTOR SYSTEMS

4.1. DESCRIPTION

Design, furnish, provide training, and install video imaging loop emulator detection systems with all necessary hardware in accordance with the plans and specifications.

Unless otherwise specified in the contract, all loop emulator detection equipment will remain the property of the contractor.

4.2. MATERIALS

A. General:

Material and equipment furnished under this section must be pre-approved on the Department's QPL by the date of installation except miscellaneous hardware such as cables and mounting hardware do not need to be pre-approved.

Used equipment will be acceptable provided the following conditions have been met:

- Equipment is listed on the current QPL.
- Equipment is in good working condition.
- Equipment is to remain the property of the contractor.

Ensure that software is licensed for use by the Department and by any other agency responsible for maintaining or operating the loop emulation system. Provide the Department with a license to duplicate and distribute the software as necessary for design and maintenance support.

Design and furnish video imaging loop emulator detection systems that detect vehicles at signalized intersections by processing video images and providing detection outputs to the signal controller in real time (within 112 milliseconds of vehicle arrival).

Furnish all required camera sensor units, loop emulator processor units, hardware and software packages, cabling, poles, mast arms, harnesses, camera mounting assemblies, surge protection panels, grounding systems, messenger cable and all necessary hardware. Furnish systems that allow the display of detection zones superimposed on an image of the roadway on a Department-furnished monitor or laptop computer screen. Ensure detection zones can be defined and data entered using a simple keyboard or mouse and monitor, or using a laptop PC with software.

Provide design drawings showing design details and camera sensor unit locations for review and acceptance before installation. Provide mounting height and location requirements for camera sensor units on the design based on site survey. Design video imaging loop emulator detection systems with all necessary hardware. Indicate all necessary poles, spans, mast arms, luminaire arms, cables,

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camera mounting assemblies and hardware to achieve the required detection zones where Department owned poles are not adequate to locate the camera sensor units. Do not design for the installation of poles in medians.

Obtain the Engineer's approval before furnishing video imaging loop emulator detection systems. The contractor is responsible for the final design of video imaging loop emulator detection systems. Review and acceptance of the designs by the Department does not relieve the contractor from the responsibility to provide fully functional systems and to ensure that the required detection zones can be provided.

Provide the ability to program each detection call (input to the controller) with the following functions:

- Full Time Delay Delay timer is active continuously,
- Normal Delay Delay timer is inhibited when assigned phase is green (except when used with TS 2 and 170/2070L controllers),
- Extend Call is extended for this amount of time after vehicle leaves detection area,
- Delay Call/Extend Call This feature uses a combination of full time delay and extend time on the same detection call. Ensure operation is as follows: Vehicle calls are received after the delay timer times out. When a call is detected, it is held until the detection area is empty and the programmed extend time expires. If another vehicle enters the detection area before the extend timer times out, the call is held and the extend time is reset. When the extend timer times out, the delay timer has to expire before another vehicle call can be received.

Provide the ability to program each detection zone as one of the following functions:

- Presence detector.
- Directional presence detector,
- Pulse detector,
- Directional pulse detector.

Ensure previously defined detector zones and configurations can be edited.

Provide each individual system with all the necessary equipment to focus and zoom the camera lenses without the need to enter the camera enclosure.

Provide systems that allow for the placement of at least 8 detection zones within the combined field of view of a single camera sensor unit. Provide a minimum of 8 detection outputs per camera.

Provide detection zones that can be overlapped. Ensure systems reliably detect vehicles when the horizontal distance from the camera sensor unit to the detection zone area is less than ten times the mounting height of the sensor. Ensure systems detect vehicles in multiple travel lanes.

Ensure systems can detect vehicle presence within a 98 to 102 percent accuracy (up to 2 percent of the vehicles missed and up to 2 percent of false detection) for clear, dry, daylight conditions, a 96 to 105 percent accuracy (up to 4 percent of the vehicles missed and up to 5 percent false detection) for dawn and dusk conditions, and a 96 percent accuracy (up to 4 percent of the vehicles missed) for night and adverse conditions (fog, snow, rain, etc.) using standard sensor optics and in the absence of occlusion.

Repair and replace all failed components within 72 hours.

The Department may conduct field-testing to ensure the accuracy of completed video imaging loop emulator detection systems.

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B. Loop Emulator System:

Furnish loop emulator systems that receive and simultaneously process information from camera sensor units, and provides detector outputs to signal controllers.

Ensure systems provide the following:

- Operate in a typical roadside environment and meet the environmental specifications and are fully compatible with NEMA TS 1, NEMA TS 2, or Type 170/2070L controllers and cabinets,
- provide a "fail-safe" mode whereby failure of one or more of the camera sensor units or power failure of the loop emulator system will cause constant calls to be placed on the affected vehicle detection outputs to the signal controller,
- provide compensation for minor camera movement of up to 2 percent of the field of view at 400 feet without falsely detecting vehicles,
- process the video at a minimum rate of 30 times per second,
- provide separate wired connectors inside the controller cabinet for video recording each camera,
- provide remote video monitoring with a minimum refresh rate at 1 frame per second over a standard dial-up telephone line,
- provide remote video detection monitoring.

Furnish camera sensor units that comply with the following:

- have an output signal conforming to EIA RS-170 standard,
- have a nominal output impedance of 75 ohms,
- be immune to bright light sources, or have built in circuitry or protective devices to prevent damage to the sensor when pointed directly at strong light sources,
- be housed in a light colored environmental enclosure that is water proof and dust tight, and that conforms to NEMA-4 specifications or better,
- simultaneously monitor at least five travel lanes when placed at the proper mounting location with a zoom lens,
- have a sunshield attached to the environmental enclosure to minimize solar heating,
- meet FCC class B requirements for electromagnetic interference emissions,
- have a heater attached to the viewing window of the environmental enclosure to prevent ice and condensation in cold weather.

Where coaxial video cables and other cables are required between the camera sensor and other components located in the controller cabinet, furnish surge protection in the controller cabinet.

If furnishing coaxial communications cable comply with the following, as recommended by the approved loop emulator manufacturer:

- Number 20 AWG, solid bare copper conductor terminated with crimped-on BNC connectors (do not use BNC adapters) from the camera sensor to the signal controller cabinet.
- Number 22 AWG, stranded bare copper conductor terminated with crimped-on BNC connectors (do not use BNC adapters) from the camera sensor unit to the junction box, and within the signal controller cabinet.

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Furnish power cable appropriately sized to meet the power requirements of the sensors. At a minimum, provide three conductor 120 VAC field power cable.

As determined during the site survey, furnish sensor junction boxes with nominal 6 x 10 x 6 inches dimensions at each sensor location. Provide terminal blocks and tie points for coaxial cable.

C. Video Imaging Loop Emulator System Support:

Furnish video imaging loop emulator systems with either a simple keyboard or a mouse with monitor and appropriate software, or with system software for use on department-owned laptop PCs. Ensure the system is Windows 2000 and Windows XP compatible.

Provide Windows 2000 and Windows XP compatible personal computer software, if needed, to provide remote video and video detection monitoring.

Ensure systems allow the user to edit previously defined detector configurations. When a vehicle is within a detection zone, provide for a change in color or intensity of the detection zone perimeter or other appropriate display changes on the Department-furnished monitor or laptop computer screen.

Provide cabling and interconnection hardware with 6-foot minimum length interconnection cable to interface with the system.

Provide all associated equipment manuals and documentation.

4.3. CONSTRUCTION METHODS

Arrange and conduct site surveys with the system manufacturer's representative and Department personnel to determine proper camera sensor unit selection and placement. Provide the Department at least 3 working days notice before conducting site surveys. Upon completion of the site surveys the Department will provide revised plans reflecting the findings of the site survey.

Before beginning work at locations requiring video imaging loop emulator detection systems, furnish system software. Upon activation of detection zones, provide detector configuration files. Ensure that up-to-date detection configuration files are furnished for various detection zone configurations that may be required for construction phasing.

Place into operation loop emulator detection systems. Configure loop emulator detection systems to achieve required detection in designated zones. Have a certified manufacturer's representative on site to supervise and assist with installation, set up, and testing of the system.

Install the necessary processing and communications equipment in the signal controller cabinet. Make all necessary modifications to install equipment, cabling harnesses, and camera sensor interface panels with surge suppression.

Perform modifications to camera sensor unit gain, sensitivity, and iris limits necessary to complete the installation.

Do not install camera sensor units on signal poles unless approved by the Engineer.

Install the necessary cables from each sensor to the signal controller cabinet along signal cabling routes. Install surge protection and terminate all cable conductors.

Relocate camera sensor units and reconfigure detection zones as necessary according to the plans for construction phases.

Provide at least 8 hours of training on the set up, operation, troubleshooting, and maintenance of the loop emulator detection system to a maximum of ten Department personnel. Arrange for training to be conducted by the manufacturer's representative at an approved site within the Division responsible for administration of the project. Thirty days before conducting training submit a

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detailed course curriculum, draft manuals and materials, and resumes. Obtain approval of the submittal before conducting the training. At least one week before beginning training, provide three sets of complete documentation necessary to maintain and operate the system. Do not perform training until installation of loop emulator detection systems is complete.

4.4. MEASUREMENT AND PAYMENT

Actual number of site surveys, arranged, conducted, and accepted.

Actual number of cameras without internal loop emulator processing units furnished, installed, and accepted.

Actual number of external loop emulator processing units furnished, installed, and accepted.

No measurement will be made of video imaging loop emulator system support or training, power and video cables, and trenching as these items will be considered incidental to furnishing and installing video imaging loop emulator detection systems.

Payment will be made under:

Site Survey	Each
Camera without Internal Loop Emulator Processing Unit	
External Loop Emulator Processing Unit	

5. METAL POLE SUPPORTS

5.1. METAL POLES

A. General:

Furnish and install metal poles, grounding systems, and all necessary hardware. Work covered under this special provision includes requirements for design, fabrication, and installation of standard and custom/site-specific designed metal pole supports and associated foundations.

Comply with applicable sections of the 2018 STANDARD SPECIFICATIONS FOR ROADS & STRUCTURES, hereinafter referred to as the Standard Specifications. Provide designs of completed assemblies with hardware equaling or exceeding AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals 6th Edition, 2013 (hereinafter called 6th Edition AASHTO), including the latest interim specifications. Provide assemblies with a round or near-round (18 sides or more) cross-section, or a multi-sided cross section with no less than six sides. The sides may be straight, convex, or concave.

For bid purposes, pole heights shown on plans are estimated from available data. Prior to furnishing metal poles, use field measurements and adjusted cross-sections to determine whether pole heights will meet required clearances. If pole heights do not meet required clearances, the Contractor should immediately notify the Engineer of the required revised pole heights.

Standard Drawings for Metal Poles are available that supplement these project special provisions. The drawings are located on the Department's website:

https://connect.ncdot.gov/resources/safety/pages/ITS-Design-Resources.aspx

Comply with article 1098-1B of the *Standard Specifications* for submittal requirements. Furnish shop drawings for approval. Provide copies of detailed shop drawings for each type of structure as summarized below. Ensure shop drawings include material specifications for each component. Ensure shop drawings identify welds by type and size on the <u>detail drawing only</u>, not in table format. **Do not release structures for fabrication until shop drawings have been approved by NCDOT**.

Ensure shop drawings contain an itemized bill of materials for all structural components and associated connecting hardware.

Comply with article 1098-1A of the *Standard Specifications* for Qualified Products List (QPL) submittals. All shop drawings must include project location description, signal or asset inventory number(s) and project number or work order number.

Summary of information required for metal pole review submittal:

Item	Electronic Submittal	Comments / Special Instructions
Sealed, Approved Signal or ITS Plan/Loading Diagram	1 set	All structure design information needs to reflect the latest approved Signal or ITS plans
Custom Pole Shop Drawings	1 set	Submit drawings on 11" x 17" format media. Show NCDOT signal or asset inventory number(s), Contractor's name and relevant revision number in the title block. All drawings must have a <u>unique drawing number</u> for each project.
Standard Strain Pole Shop Drawings (from the QPL)	1 set	Submit drawings on 11" x 17" format media. Show NCDOT signal inventory number(s), Contractor's name and relevant revision number in the title block. All drawings must have a unique drawing number for each project.
Structure Calculations	1 set	Not required for Standard QPL Poles
Standard Strain Pole Foundation Drawings	1 set	Submit drawings on 11" x 17" format media. Submit a completed Standard Foundation Selection form for each pole using foundation table on Metal Pole Drawing M8.
Custom Foundation Drawings	1 set	Submit drawings on 11" x 17" format media. Show NCDOT signal or asset inventory number(s), Contractor's name and relevant revision number in the title block. All drawings must have a <u>unique drawing number</u> for each project. If QPL Poles are used, include the corresponding QPL pole shop drawings with this submittal.
Foundation Calculations	1 set	Submit copies of LPILE input, output, and pile tip deflection graph per Section titled Drilled Pier Foundations for Metal Poles of this specification for each foundation. Not required for Standard Strain Poles (from the QPL)
Soil Boring Logs and Report	1 set	Report shall include a location plan and a soil classification report including soil capacity, water level, hammer efficiency, soil bearing pressure, soil density, etc. for each pole.

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NOTE – All shop drawings and custom foundation design drawings must be sealed by a Professional Engineer licensed in the state of North Carolina. All geotechnical information must be sealed by either a Professional Engineer or Geologist licensed in the state of North Carolina. Include a title block and revision block on the shop drawings and foundation drawings showing the NCDOT signal or asset inventory number(s).

Shop drawings and foundation drawings may be submitted together or separately for approval. However, shop drawings must be approved before foundations can be reviewed. Foundation designs will be returned without review if the associated shop drawing has not been approved. Boring reports shall include the following: Engineer's summary, boring location maps, soil classification per AASHTO Classification System, hammer efficiency, and Metal Pole Standard Foundation Selection Form. Incomplete submittals will be returned without review. The Reviewer has the right to request additional analysis and copies of the calculations to expedite the approval process.

B. Materials:

Fabricate metal pole from coil or plate steel that meet the requirements of ASTM A 595 Grade A tubes. For structural steel shapes, plates, and bars use, as a minimum, ASTM A572 Gr 50, AASHTO M270 Gr 50, ASTM A709 Gr 50, or an approved equivalent. Provide pole shafts of round or near round (18 sides or more) cross-section, or multi-sided tubular cross-section with no less than six sides, having a uniform linear taper of 0.14 in/ft. Construct shafts from one piece of single-ply plate or coil. For anchor base fabrication, conform to the applicable bolt pattern and orientation as shown on Metal Pole Standard Drawing Sheet M2.

Use the submerged arc process, or other NCDOT previously approved process suitable for shafts, to continuously weld pole shafts along their entire length. Finish the longitudinal seam weld flush with the outside contour of the base metal. Ensure shaft has no circumferential welds except at the lower end joining the shaft to the pole base. Use full penetration groove welds with backing ring for all tube-to-transverse-plate connections in accordance with 6th Edition AASHTO. Provide welding that conforms to Article 1072-18 of the *Standard Specifications*. No field welding on any part of the pole will be permitted unless approved by a qualified Engineer.

After fabrication, hot-dip galvanize steel poles and all assembly components in accordance with section 1076-3 of the *Standard Specifications*. Design structural assemblies with weep holes large enough and properly located to drain molten zinc during the galvanization process. Galvanize hardware in accordance with section 1076-4 of the *Standard Specifications*. Ensure threaded material is brushed and retapped as necessary after galvanizing. Perform repair of damaged galvanizing in accordance with section 1076-7 of the Standard *Specifications*. *Ensure* all hardware is galvanized steel or stainless steel. The Contractor is responsible for ensuring the Designer/Fabricator specifies connecting hardware and/or materials that prevent a dissimilar metal corrosive reaction.

Ensure each anchor rod is 2-inch minimum diameter and 60-inch length. Provide 10-inch minimum thread projection at the top of the rod, and 8-inch minimum at the bottom of the rod. Use anchor rod assembly and drilled pier foundation materials complying with SP09_R005, hereinafter referred to as *Foundations and Anchor Rod Assemblies for Metal Poles*.

Ensure anchor bolt hole diameters are ¼-inch larger than the anchor bolt diameters in the base plate.

Provide a circular anchor bolt lock plate securing the anchor bolts at the embedded end with two (2) washers and two (2) nuts. Provide a base plate template matching the bolt circle diameter of the

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anchor bolt lock plate. Construct plates and templates from ¼-inch minimum thick steel with a minimum width of 4 inches. Hot-dip galvanizing is not required for both plates.

Provide four (4) heavy hex nuts and four (4) flat washers for each anchor bolt. For nuts, use AASHTO M291 grade 2H, DH, or DH3 or equivalent material. For flat washers, use AASHTO M293 or equivalent material. Ensure anchor bolts have required diameters, lengths, and positions, and will develop strengths comparable to their respective poles.

For each pole, provide a grounding lug with a ½-inch minimum thread diameter, coarse thread stud and nut that will accommodate #4 AWG ground wire. Ensure the lug is electrically bonded to the pole and is conveniently located inside the pole at the hand hole.

Provide a removable pole cap with stainless steel attachment screws for the top of each pole. Ensure cap is cast aluminum conforming to Aluminum Association Alloy 356.0F. Furnish cap attached to the pole with a sturdy stainless-steel chain that is long enough to permit cap to hang clear of the pole-top opening when cap is removed.

Where required by the plans, furnish couplings 42 inches above bottom of the pole base for mounting of pedestrian pushbuttons. Provide mounting points consisting of 1½-inch internally threaded half-couplings complying with the NEC, mounted within the poles. Ensure that couplings are essentially flush with the outside surfaces of the poles and are installed before any required hot-dip galvanizing. Provide a threaded plug in each mounting point. Ensure the surface of the plug is essentially flush with the outer end of the mounting point when installed and has a recessed slot that will accommodate a ½ "drive standard socket wrench.

Metal poles may be erected and fully loaded after concrete has attained a minimum allowable compressive strength of 3,000 psi.

Connect poles to grounding electrodes and bond them to the electrical service grounding electrodes

When field drilling is necessary for wire or cable entrances into the pole, comply with the following requirements:

- Do not drill holes within 2 inches of any welds.
- Do not drill any holes larger than 3 inches in diameter without checking with the ITS & Signals Structure Engineers.
- Avoid drilling multiple holes along the same cross section of tube shafts.
- Install rubber grommets in all field drilled holes that wire, or cable will directly enter unless holes are drilled for installation of weather heads or couplings.
- Treat the inside of the drilled holes and repair all galvanized surfaces in accordance with Section 1076-7 of the latest edition of the *Standard Specification prior to installing grommets*, *caps*, *or plugs*.
- Cap or plug any existing field drilled holes that are no longer used with rubber, aluminum, or stainless-steel hole plugs.

When street lighting is installed on metal signal structures, isolate the conductors feeding the luminaires inside the pole shaft using liquid tight flexible metal conduit (Type LFMC), liquid tight flexible nonmetallic conduit (Type LFNC), high density polyethylene conduit (Type HDPE), or approved equivalent. All conductors supplying power for luminaires must run through an external disconnect prior to entrance into the structure. Comply with applicable National Electrical Safety Codes (NESC). Refer to Article "G" Luminaire Arms.

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Install a ¼-inch thick plate for a concrete foundation tag to include the following information: concrete grade, depth, diameter, and reinforcement sizes of the installed foundation. Install galvanized wire mesh to cover gap between the base plate and top of foundation for debris and pest control. Refer to standard drawing M7 for further details.

Immediately notify the Engineer of any structural deficiency that becomes apparent in any assembly, or member of any assembly, because of the design requirements imposed by these specifications, the plans, or the typical drawings.

C. Design:

Unless otherwise specified, design all metal pole support structures using the following 6th Edition AASHTO specifications:

- Design for a 50-year service life as recommended by Table 3.8.3-2.
- Use wind pressure map developed from 3-second gust speeds, as provided in Section 3.8.
- Assume wind loads as shown in Figures 3.9.4.2-2 and 3.9.4.2-3 of the 6th Edition AASHTO for Group III loading with Ice.
- Ensure metal pole support structures include natural wind gust loading and truck-induced gust loading for fatigue design, as provided in Sections 11.7.1.2 and 11.7.1.3, respectively. Designs need not consider periodic galloping forces.
- Assume 11.2 mph natural wind gust speed in North Carolina. For natural wind fatigue stress
 calculations, utilize a drag coefficient (C_d) based on the yearly mean wind velocity of 11.2
 mph.
- When selecting Fatigue Importance Factors, utilize Fatigue Importance Category II, as provided for in Table 11.6-1, unless otherwise specified.
- Calculate all stresses using applicable equations from Section 5. The Maximum allowable stress ratio for all metal pole support designs is 0.9.
- Conform to Sections 10.4.2 and 11.8 for deflection requirements. For CCTV support structures, ensure maximum deflection at top of pole does not exceed 2.0 percent of pole height.
- Assume the combined minimum weight of a messenger cable bundle (including messenger cable, signal cable and detector lead-in cables) is 1.3 lbs/ft. Assume the combined minimum diameter of the cable bundle is 1.3 inches.

Unless otherwise specified by special loading criteria, the following computed surface area for ice load on signal heads shall be used:

- 3-section, 12-inch, Surface area: 26.0 ft²
- 4-section, 12-inch, Surface area: 32.0 ft²
- 5-section, 12-inch, Surface area: 42.0 ft²

Design a base plate for each pole. The minimum base plate thickness for all poles is determined by the following criteria:

<u>Case 1</u> Circular or rectangular solid base plate with the upright pole welded to the top surface of base plate with full penetration butt weld, where no stiffeners are provided. A base plate with a small center hole, which is less than 1/3 of the upright diameter, and located concentrically with the upright pole, may be considered as a solid base plate.

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The magnitude of bending moment in the base plate, induced by the anchoring force of each anchor bolt is $M = (P \times D_1) / 2$, where

M = bending moment at the critical section of the base plate induced by one (1) anchor bolt

P = anchoring force of each anchor bolt

 D_1 = horizontal distance between the anchor bolt center and the outer face of the upright, or the difference between the bolt circle radius and the outside radius of the upright

Locate the critical section at the face of the anchor bolt and perpendicular to the bolt circle radius. The overlapped part of two (2) adjacent critical sections is considered ineffective.

<u>Case 2</u> Circular or rectangular base plate with the upright pole socketed into and attached to the base plate with two (2) lines of fillet weld, and where no stiffeners are provided, or any base plate with a center hole that is larger in diameter than 1/3 of the upright diameter.

The magnitude of bending moment induced by the anchoring force of each anchor bolt is $M = P \times D_2$,

where P = anchoring force of each anchor bolt

 D_2 = horizontal distance between the face of the upright and the face of the anchor bolt nut

Locate the critical section at the face of the anchor bolt top nut and perpendicular to the radius of the bolt circle. The overlapped part of two (2) adjacent critical sections is considered ineffective. If the base plate thickness calculated for Case 2 is less than Case 1, use the thickness calculated for Case 1.

The following additional requirements apply concerning pole base plates.

- Ensure that whichever case governs as defined above, the anchor bolt diameter is set to match the base plate thickness. If the minimum diameter required for the anchor bolt exceeds the thickness required for the base plate, set the base plate thickness equal to the required bolt diameter.
- For all metal poles, use a full penetration groove weld with a backing ring to connect the pole upright component to the base. Refer to Metal Pole Standard Drawing Sheet M3 or M4.

The Professional Engineer is wholly responsible for the design of all poles. Review and acceptance of these designs by the Department does not relieve the said Professional Engineer of his or her responsibility.

D. Mast Arm Poles:

Refer to Metal Pole Standard Drawing Sheets M2 through M5 for fabrication details.

Fabricate metal arm shaft from coil or plate steel that meet the requirements of ASTM A 595 Grade A tubes. Provide arm shafts of round or near round (18 sides or more) cross-section, or multisided tubular cross-section with no less than six sides, having a uniform linear taper of 0.14 in/ft. Construct shafts from one piece of single-ply plate or coil, eliminating circumferential weld splices.

Use the submerged arc process, or other NCDOT previously approved process suitable for arm shafts, to continuously weld arm shafts along their entire length. The longitudinal seam weld shall be finished flush to the outside contour of the base metal. Ensure arm shaft has no circumferential welds except at the lower end joining the shaft to the arm flange plate. Use full penetration groove welds with backing ring for all tube-to-transverse-plate connections in accordance with 6th Edition AASHTO. Provide welding that conforms to Article 1072-18 of the *Standard Specifications*, except

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no field welding on any part of the arm shaft will be permitted unless approved by a qualified Engineer.

After fabrication, hot-dip galvanize steel arm shafts and all assembly components per section 1076 of the *Standard Specifications*. Design arm shafts with weep holes large enough and properly located to drain molten zinc during the galvanization process. Provide hot-dip galvanizing on steel arm shafts that meets or exceeds ASTM Standard A-123, AASHTO M111, or an approved equivalent. Perform repair of damaged galvanizing that complies with the following *Standard Specifications* article:

Repair of GalvanizingArticle 1076-7

Ensure metal arm shafts permit cables to be installed inside arm shafts. For holes in arm shafts used to accommodate cables, provide full-circumference grommets. Wire access holes for arm flange plates should be deburred, non-grommeted, and oversized to fit around 4-inch diameter grommeted wire access holes for shaft flange plates.

Provide a minimum of four (4) 1-1/2" diameter high strength bolts for connection between arm plate and pole plate. Increase number of bolts to a minimum of six (6) 1-1/2" diameter high strength bolts when arm lengths are greater than 50'-0" long.

Provide designs with a 6" x 12" hand hole with reinforcing frame for each pole.

Provide a terminal compartment with cover and screws in each pole encompassing the hand hole and containing a 12-terminal barrier type terminal block. Provide two (2) terminal screws with a removable shorting bar between them for each termination. Furnish terminal compartment covers attached to the pole by a sturdy chain or cable approved by the Engineer. Ensure chain or cable is long enough to permit cover to hang clear of the compartment opening when cover is removed and is strong enough to prevent vandalism. Ensure chain or cable will not interfere with service to cables in the pole base.

Have poles permanently stamped above the hand holes with the identification tag details as shown on Metal Pole Standard Drawing Sheets M2 and M4.

Provide a removable end cap with stainless steel attachment screws for the end of each mast arm. Ensure cap is cast aluminum conforming to Aluminum Association Alloy 356.0F. Furnish cap attached to arm with a sturdy chain or cable approved by the Engineer. Ensure chain or cable is long enough to permit cap to hang clear of arm end opening when cap is removed.

Provide pole flange plates and associated gussets and fittings for attachment of required mast arms. As part of each mast arm attachment, provide a cable passage hole in pole to allow passage of cables from pole to arm. Provide a grommeted 4-inch diameter cable passage hole on the shaft side of the connection to allow passage of cables from pole to arm.

Furnish all arm plates and necessary attachment hardware, including bolts and brackets.

Provide two (2) extra bolts for each arm.

Provide arms with weatherproof connections for attaching to the pole shaft.

Provide hardware that is galvanized steel, stainless steel, or corrosive-resistant aluminum.

Install metal poles, hardware, and fittings as shown on the manufacturer's installation drawings. Ensure the installed pole, when fully loaded, is within 1 degree 40 minutes (1°40') of vertical. Install poles with the manufacturer's recommended "rake." Where required, use threaded leveling nuts to establish rake.

Install horizontal-type arms with a manufactured rise preventing arm from deflecting below arm attachment height.

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Ensure maximum angular rotation of the top of mast arm pole does not exceed 1 degree 40 minutes (1°40'). Ensure allowable mast arm deflection does not exceed that allowed per 6th Edition AASHTO. For all group load combinations specified under Section 3 of 6th Edition AASHTO, restrict tip of fully loaded arm from going below arm attachment point with the pole.

5.2. DRILLED PIER FOUNDATIONS FOR METAL POLES

Analysis procedures and formulas shall be based on AASHTO 6th Edition, latest ACI-318 code and the *Drilled Shafts: Construction Procedures and Design Methods* FHWA-NHI-10-016 manual. Design methods based on engineering publications or research papers must have prior approval from NCDOT. The Department reserves the right to accept or reject any method used for the analysis.

Use the following Safety Factors for the foundation design:

- 1.0 x Service (Unfactored) Loads for LPile Shaft Lateral Deflection
- 1.3 x Torsion (Unfactored) Load for Drilled Shaft Concrete and Steel Strength
- (1.3 / 1.33) x Torsion (Unfactored) Load for Shaft Soil-to-Concrete Torsion Capacity
- (2.0 / 1.33) x Axial (Unfactored) Load for Shaft Axial Capacity in Soil

Ensure deflection at top of foundation does not exceed 1 inch for worst-case lateral load.

Use LPILE Plus V6.0 or later for lateral analysis. Submit inputs, results and corresponding graphs with the design calculations.

Calculate skin friction using the α -method for cohesive soils and the β -method for cohesion-less soils (**Broms method will not be accepted**). Detailed descriptions of the " α " and " β " methods can be found in *FHWA-NHI-10-016*.

Omit first 2.5 feet for cohesive soils when calculating skin friction.

Assume a hammer efficiency of 0.70 unless value is provided.

Design custom foundations to carry maximum capacity of each metal pole. For standard case strain poles with custom design, use actual shear, axial and moment reactions from the Standard Strain Pole Foundation Selection Table shown on Standard Drawing No. M8.

When poor soil conditions are encountered, which could create an excessively large foundation design, consideration may be given to allow an exemption to the maximum capacity design. The Contractor must gain approval from the Engineer before reducing a foundation's capacity. On projects where poor soil is known to be present, the Contractor should have foundation designs approved before releasing poles for fabrication.

Have the Contractor notify the Engineer if the proposed foundation is to be installed on a slope other than 8H: 1V or flatter.

A. Description:

Furnish and install foundations for NCDOT metal poles with all necessary hardware in accordance with the plans and specifications.

Metal Pole Standards have been developed and implemented by NCDOT for use at signalized intersections in North Carolina. If the plans call for a standard strain pole, then a standard foundation may be selected from the plans. However, the Contractor is not required to use a standard foundation. If the Contractor chooses to design a non-standard site-specific foundation for a standard strain pole or if the plans call for a non-standard site-specific pole, design the foundation to conform to the applicable provisions in the NCDOT Metal Pole Standard Drawings and Section B4 (Non-Standard Foundation Design) below. If non-standard site-specific foundations are designed for standard QPL approved strain poles, the foundation designer must use the design moment

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specified by load case on Metal Pole Standard Drawing Sheet M8. Failure to conform to this requirement will be grounds for rejection of the design.

If the Contractor chooses to design a non-standard foundation for a standard strain pole and the soil test results indicate a standard foundation is feasible for the site, the Contractor will be paid the cost of the standard foundation. Any additional cost associated with a non-standard site-specific foundation including additional materials, labor and equipment will be considered incidental to the cost of the standard foundation. All costs for the non-standard foundation design will be considered incidental to the cost of the standard foundation.

B. Soil Test and Foundation Determination:

1. General:

Drilled piers are reinforced concrete sections, cast-in-place against in situ, undisturbed material. Drilled piers are of straight shaft type and vertical.

2. Soil Test:

Perform a soil test at each proposed metal pole location. Complete all required fill placement and excavation at each pole location to finished grade before drilling each boring. Soil tests performed that are not in compliance with this requirement may be rejected and will not be paid. Drill one boring to a depth of 26 feet within a 25-foot radius of each proposed foundation.

Perform standard penetration tests (SPT) in accordance with ASTM D 1586 at depths of 1, 2.5, 5, 7.5, 10, 15, 20 and 26 feet. Discontinue the boring if one of the following occurs:

- A total of 100 blows have been applied in any two consecutive 6-inch intervals.
- A total of 50 blows have been applied with < 3-inch penetration.

Describe each pole location along the project corridor in a manner that is easily discernible to both the Contractor's Designer and NCDOT Reviewers. If the pole is at an intersection, label the boring the "Intersection of (*Route or SR #*), (*Street Name*) and (*Route or SR #*), (*Street Name*),

______ County, Signal or Asset Inventory No. ______ ". Label borings with "B- N, S, E, W, NE, NW, SE or SW" corresponding to the quadrant location within the intersection.

If the pole location is located between intersections, provide a coordinate location and offset, or milepost number and offset. Pole numbers should be made available to the Drill Contractor. Include pole numbers in the boring label if they are available. If they are not available, ensure the boring labels can be cross-referenced to corresponding pole numbers. For each boring, submit a legible (hand-written or typed) boring log signed and sealed by a licensed Geologist or Professional Engineer registered in North Carolina. Include on each boring the SPT blow counts and N-values at each depth, depth of the boring, hammer efficiency, depth of water table and a general description of the soil types encountered using the AASHTO Classification System.

Borings that cannot be easily correlated to their specific pole location will be returned to the Contractor for clarification; or if approved by the Engineer, the foundation may be designed using the worst-case soil condition obtained as part of this project.

3. Standard Foundation Determination:

Use the following method for determining the Design N-value:

$$\begin{split} N_{AVG} &= \frac{N_{@1'} + N_{@2.5'} + \dots + N_{@Deepest\ Boring\ Depth}}{Total\ Number\ of\ N\ values} \\ Y &= (N_{@1'})^2 + (N_{@2.5'})^2 + \dots + (N_{@Deepest\ Boring\ Depth})^2 \end{split}$$

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$$Z = N_{@1'} + N_{@2.5'} + \dots + N_{@Deeepest\ Boring\ Depth}$$

$$N_{STD\ DEV} = \sqrt{\frac{(Total\ Number\ of\ N\ values\ \times Y) - Z^2}{(Total\ Number\ of\ N\ values) \times (Total\ Number\ of\ N\ values - 1)}}$$

Design N-value equals lesser of the following two conditions:

$$N_{AVG}-(N_{STD\ DEV}\times 0.45)$$

$$OR$$

$$Average\ of\ First\ Four\ (4)N\ values=\frac{N_{@1},+N_{@2.5},+N_{@5},+N_{@7.5},}{4}$$

Note: If less than four (4) N-values are obtained because of criteria listed in Section 2 above, use average of N-values collected for second condition. Do not include the N-value at the deepest boring depth for above calculations if the boring is discontinued at or before the required boring depth because of criteria listed in Section 2 above. Use N-value of zero (0) for weight of hammer or weight of rod. If N-value is greater than fifty (50), reduce N-value to fifty (50) for calculations.

If standard NCDOT strain poles are shown on the plans and the Contractor chooses to use standard foundations, determine a drilled pier length, "L," for each signal pole from the Standard Strain Pole Foundations Chart (sheet M8) based on the Design N-value and the predominant soil type. For each standard pole location, submit a completed "Metal Pole Standard Foundation Selection Form" signed by the Contractor's representative. Signature on form is for verification purposes only. Include the Design N-value calculation and resulting drilled pier length, "L," on each form.

If non-standard site-specific poles are shown on the plans, submit completed boring logs collected in accordance with Section 2 (Soil Test) along with pole loading diagrams from the plans to the Contractor-selected pole Fabricator to assist in the pole and foundation design.

If one of the following occurs, the Standard Foundations Chart shown on the plans may not be used and a non-standard foundation may be required. In such case, contact the Engineer.

- The Design N-value is less than four (4).
- The drilled pier length, "L", determined from the Standard Foundations Chart, is greater than the depth of the corresponding boring.

In the case where a standard foundation cannot be used, the Department will be responsible for the additional cost of the non-standard foundation.

Foundation designs are based on level ground around the traffic signal pole. If the slope around the edge of the drilled pier is steeper than 8:1 (H:V) or the proposed foundation will be less than 10 feet from the top of an embankment slope, the Contractor is responsible for providing slope information to the foundation Designer and to the Engineer so it can be considered in the design.

The "Metal Pole Standard Foundation Selection Form" may be found at:

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https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

If assistance is needed, contact the Engineer.

4. Non-Standard Foundation Design:

Design non-standard foundations based upon site-specific soil test information collected in accordance with Section 2 (Soil Test). Design drilled piers for side resistance in accordance with Section 4.6 of the 2002 AASHTO Standard Specifications for Highway Bridges, 17th Edition. Use computer software LPILE version-6.0 or later manufactured by Ensoft, Inc. to analyze drilled piers. Use computer software gINT V8i or later manufactured by Bentley Systems, Inc. with the current NCDOT gINT library and data template to produce SPT boring logs. Provide a drilled pier foundation for each pole with a length and diameter resulting in horizontal lateral movement less than 1 inch at top of the pier, and horizontal rotational movement less than 1 inch at the edge of pier. Contact the Engineer for pole loading diagrams of standard poles used for non-standard foundation designs. Submit non-standard foundation designs including drawings, calculations, and soil boring logs to the Engineer for review and approval, before construction.

C. Drilled Pier Construction:

Construct drilled pier foundation and Install anchor rod assemblies in accordance with the *Foundations and Anchor Rod Assemblies for Metal Poles* Standard Special Provision SP09-R005 located at:

https://connect.ncdot.gov/resources/Specifications/Pages/2018-Specifications-and-Special-Provisions.aspx

5.3. POLE NUMBERING SYSTEM

A. New Poles

Attach an identification tag to each pole shaft section as shown on Metal Pole Standard Sheet M2 "Typical Fabrication Details for All Metal Poles."

5.4. MEASUREMENT AND PAYMENT

Actual number of metal poles with single mast arms furnished, installed, and accepted.

Actual number of metal poles with dual mast arms furnished, installed, and accepted.

Actual number of designs for mast arms with metal poles furnished and accepted.

Actual number of metal signal pole foundations removed and disposed.

Actual number of metal signal poles removed and disposed.

Actual number of soil tests with SPT borings drilled furnished and accepted.

Actual volume of concrete poured in cubic yards of drilled pier foundation furnished, installed and accepted.

No measurement will be made for foundation designs prepared with metal pole designs, as these will be considered incidental to designing Traffic Signal or CCTV support structures.

Payment will be made under:

Metal Pole with Single Mast Arm	Each
Metal Pole with Dual Mast Arm	Each
Mast Arm with Metal Pole Design	Each
Metal Pole Foundation Removal	Each
Metal Pole Removal	Each

Soil Test	Each
Drilled Pier Foundation	Cubic Yard

6. PROTECTIVE COATING FOR METAL POLES

6.1. Description

Protective coating for metal poles is a supplemental durable color coating that is applied to galvanized steel and aluminum traffic signal structures installed in locations where maintaining an aesthetic appearance is important. Powder Coating is the preferred supplemental protective coating process for coating galvanized steel and aluminum structures. However, for the purposes of this special provision, an Acrylic Primer and topcoat paint system is included as an acceptable alternative when protective color coating is required.

Provide protective coating over galvanization for all steel poles including all necessary hardware in accordance with the plans and specifications. Any aluminum components do not need to be galvanized before application of protective coating.

6.2. Materials

With the exception of aluminum components, furnish all metal poles with galvanic protection along with a tough and durable application of protective coating. Aluminum components shall have a durable powder coating application. Galvanization is not required for aluminum components.

Furnish pole caps that have a low gloss powder finish applied over a hot-dipped galvanized surface. Comply with the applicable provisions of Section 442-10 and 442-13 of the 2018 *Standard Specifications*.

Ensure the selected color for protective coating has been verified and approved by the Engineer prior to fabrication.

6.3. Coating Shop Approval

Approve the coating shop facility prior to the application of any coating process. Submit all requests, procedures, and documents electronically to:

- Mr. Cabell Garbee, P.E., Manufactured Products Engineer
- cgarbee@ncdot.gov
- A) Submit a quality control procedure that the company has established to ensure a quality and durable coating. The quality control procedure shall contain at a minimum the following:
 - Qualified / Certified personnel to manage the QC Program and to conduct Quality Control tests
 - Qualified / certified coaters
 - Source and type of powder
 - How the powder will be stored
 - Powder application facility (heated or unheated)
 - Surface pre-treatment
 - Surface preparation including profile
 - Application methods
 - Curing conditions (conventional or infrared)

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- Curing Temperature
- Adhesion & Holiday Detection
- Repair Procedure
- Storage and protection of coated items
- Shipping and handling (packing, protection, and wrapping)
- B) Submit a powder certification from the manufacturer
- C) Submit the following to the Chemical Testing Engineer a minimum of four weeks prior to coating application.
 - 1. Two test panels of ASTM A36 steel, ¼ or greater in thickness measuring 8 inches by 11 inches using the proposed color of the final coat; a powder coated over galvanized test panel and a powder coated over un-galvanized test panel.
 - 2. In addition, provide two (2) samples of the same or comparable material and thickness as production pieces. Ensure production piece replicas do not exceed twelve inches (12") in length and width nor 50 pounds in weight.
 - 3. Submit all test panels with inspection reports and records according to *Standard Specifications*, Section 442, Section 1072, Section 1076, and Section 1080.
 - 4. Acceptance of the panels is determined by meeting the requirements of ASTM D-4541 of 800 psi for both galvanized and un-galvanized and production piece test panels.
 - 5. Send all panels to:

Materials and Tests Unit 1801 Blue Ridge Road Raleigh, NC 27607

Attn: Chemical Testing Engineer

6.4. POWDER COATING

A. Galvanizing

Galvanize steel products in accordance with Section 1076 of the *Standard Specifications*. Ensure the fabricator or designated representative(s) that is supplying the components to be galvanized communicates with the galvanizer to indicate that the galvanized pieces will be powder coated to avoid water or chromate quenching.

B. Surface Preparation

Comply with manufacturer's recommended surface coating specifications, Steel Structure Painting Council (SSPC) specifications and applicable articles of Section 442 (Painting Steel Structures) of the *Standard Specifications*. Ensure that surface preparations and treatments are performed and meet the requirements of the above referenced specifications.

Some pole components, specifically steel plates ¾ inches or more in thickness, may need blast cleaning prior to structure assembly to remove impurities and non-metallic foreign materials. Mechanically remove all weld flux after structure is assembled

Degrease and prepare steel structure for zinc coating after assembly using full immersion baths and pickling processes in heat controlled caustic and acid solutions.

Rinse and clean structure to remove caustic or acid solutions by immersion in a circulating fresh water bath. Immerse structure in a heat controlled concentrated zinc ammonium chloride flux solution and air dry as a final prep before hot-dip galvanization.

Ensure that the surface preparation is no less than specified by the powder manufacturer's recommendations. Prepare all components to be coated in accordance with SSPC SP-2 (Hand Tool Cleaning) and/or SSPC SP-3 (Power Tool Cleaning). Remove all drainage spikes, high spots, protrusions or other surface defects using hand or power tools. Do not remove the galvanization below the limits set forth in AASHTO M111.

Remove grease, oils, moisture, scale, rust or any other foreign matter prior to powder coating to ensure ideal adhesion and coating performance. Prepare and coat the galvanized surface as soon as possible after the galvanization process.

C. Powder Coating Application and Curing

Prepare galvanized finish for powder coating by brush blasting in accordance with SSPC-SP7. Ensure all threaded components of the structure are protected from damage during blasting process.

Use thermosetting powder resin that meets 5A or 5B classifications of ASTM D3359. Apply powder coating electrostatically. Follow manufacturer's recommended preheating requirements. Ensure the topcoat finish is applied uniformly to all surfaces with a dry film thickness of between 3.0 to 5.0 mils. Cure the topcoat by heating the structure to manufacturer recommended temperatures at the duration required to ensure complete and uniform bond.

D. Quality Control

Ensure the applicator provides all test reports and documentation and inspects all coated material as outlined in the *Standard Specifications*, Section 442, Section 1072, Section 1076, and Section 1080. Ensure the quality control inspection is kept separate from the production functions.

E. Storage, Shipping, and Handling

Store all powder coated material inside or as directed by the Engineer.

Protect the product from incurring damage during all shipping, handling, and storing activities. Do not store the product directly on the ground or in areas where water may pool; the Engineer determines the effectiveness of all storage, shipping and handling methods.

F. Repair of Powder Coated Material

Repair all damage to the coating by the original method of application as outlined in the coating facility's repair procedure. Ensure all repair areas meet the original requirements for adhesion as stated in this Project Special Provision.

Photograph, document, and report all damages upon delivery to the project site prior to unloading. Provide documented damage notifications to the Engineer or to their authorized representative so the application firm can be notified. The Engineer has the authority to accept or reject the material as outlined in the *Standard Specifications*.

Submit to the Engineer a repair procedure for damaged coatings which occur during storage, transporting, handling and or installation. Utilize a liquid paint approved by the

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Department, compatible with the powder applied product. Ensure all repair areas demonstrate an adhesion rating of 400 psi in accordance with ASTM D-4541. Obtain Engineer's acceptance of the final finish.

6.5.ACRYLIC PRIMER AND TOP COAT PAINT SYSTEM

A. Description

Follow NCDOT procedures for Powder Coating over Galvanizing. Provide an Acrylic Primer and top coat when a substitute for powder coating is necessary.

Provide supplemental coating for all mast arms with metal signal poles and all necessary hardware for the signalized intersection in accordance with the Structural Steel Shop Coatings Program, NCDOT Standard specifications – sections 442 and 1080, as contained herein, and as shown on the plans. The Structural Steel Shop Coatings Program can be found at the following link: https://connect.ncdot.gov/resources/Materials/MaterialsResources/Structural%20Steel%20Shop%20 Coatings%20Program.pdf

Ensure all painting work for new structures, except field touch-up and bolt painting is performed in the shop.

Coatings Shop Approval

Use only NCDOT approved shop coating facilities meeting the requirements outlined in the current edition of the Structural Steel Shop Coatings Program. This program is available on the Materials and Tests website.

Provide shop certification in accordance with the Structural Steel Shop Coatings Program (Shop facilities that are currently certified and in good standing with the American Institute Steel Construction (AISC) / Sophisticated Paint Endorsement (SPE) and/or the Society of Protective Coatings (SSPC) Qualification Procedure Three (QP-3).

B. Surface Preparation

Ensure all surface preparation is not less than that specified by the paint manufacturer's recommendations.

Clean galvanized surfaces to be painted with a 2,500 psi pressure washer. Allow surfaces to dry completely before beginning surface preparation.

Ensure all components to be coated are prepared in accordance with SSPC SP2 (Hand Tool Cleaning and or SSPC SP-3 (Power Tool Cleaning). Smooth high spots and rough edges, such as metal drip lines, of galvanized surfaces in accordance with ASTM D6386. Do not remove the galvanization below the limits set forth in AASHTO M111.

Perform abrasive sweep blasting in accordance with ASTM D6386. Refer to this section for a description of the abrasive blast material to be used. Use a material and technique capable of

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stripping action to remove corrosion products and to provide a rough surface profile while leaving base zinc layers intact.

Blow down all blasted surfaces with clean compressed air to provide a clean, dry surface.

Ensure all surfaces are free of visible zinc oxides or zinc hydroxides.

C. Materials

Use an approved/qualified waterborne paint meeting the requirements of NCDOT Standard specification section 1080. Do not apply paint until each batch has been tested by the Department. Provide color as specified in the contract documents.

Ensure all paint used on this contract is produced by the same manufacturer.

D. Painting

Apply paint in accordance with the requirements of the Structural Steel Shop Coatings Program, Section 442 and Section 1080 of the *Standard Specifications* as modified herein.

System for Paint over Galvanize Acrylic Primer and Topcoats

Coat	Material	Mils Dry/Wet Film	Mils Dry/Wet Film	
		Thickness	Thickness	
		Minimum	Maximum	
Primer	1080-9 White	3.0 DFT	5.0 DFT	
Stripe	1080-9 *	4.0 WFT	7.0 WFT	
Topcoat	1080-9 *	2.0 DFT	4.0 DFT	
Total		5.0 DFT	9.0 DFT	

^{*}Ensure the selected color for protective coating has been verified and approved by the Engineer prior to fabrication.

The time between blast and coating application shall be in accordance with ASTM D6386 time requirements. In no case shall the prepared surface extend beyond 8 hours.

Mask off and do not paint all data plates and faying surfaces prior to application.

Spray apply all coatings except for the stripe coat. Brush apply the stripe coat to all plate edges, welds, bolt holes and bolts prior to applying the finish coat.

E. Curing

Follow manufacturer recommendations.

F. Inspection

Quality Control shall conduct the required quality control tests as outlined in the Structural Steel Shop Coatings Program and report the minimum information required by the appropriate ASTM test methods. At a minimum, quality control forms shall be on company letterhead with logo that provides a daily inspection report form equivalent to the information required on the M&T-611

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Form. The M&T-611 Form can be found in the Structural Steel Shop Coatings Program. Dry Film Thickness (DFT) measurements shall be obtained on all coating layers, including the galvanized layer and shall incorporate the use of a Type 2 gauge as defined in SSPC PA-2.

Ensure all material is of a uniform appearance free of runs, drips, and sags.

G. Handling

Do not handle, ship, or erect coated members until paint is thoroughly dry.

Protect all shipping and handling either from the coating facility to project site and or storage site to area(s) to construction location from incurring damage to product. Wood blocks and nylon slings are recommended for securing, loading, hoisting or storing members.

H. Repair of Damaged Coating

Repair damage occurring to the galvanized portion of the coating during shipment or installation in accordance with Articles 1076-7 and 1080-7 of the *Standard Specifications*. Repair damage occurring to the painted portion of the coating during shipment or installation by applying 4.0-7.0 wet mils of topcoat with a brush or roller and feather or taper this to be level with the surrounding areas.

6.6. MEASUREMENT AND PAYMENT

Actual number of single mast arm poles with protective coating applied furnished, installed, and accepted.

Actual number of dual mast arm poles with protective coating applied furnished, installed, and accepted.

Actual number of signal pedestals with protective coating applied furnished, installed, and accepted.

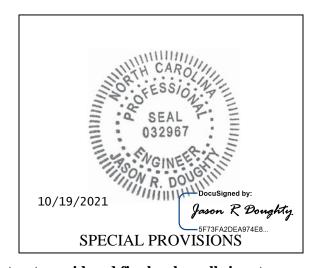
Payment will be made under:

Protective Coating for Single Mast Arm Pole ()Each
Protective Coating for Dual Mast Arm Pole (
	 Each

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PROJECT SPECIAL PROVISIONS STRUCTURES, CULVERTS & SOUND BARRIER WALLS

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Document not considered final unless all signatures complete.

R-2233BB Rutherford County

(8-13-04)

MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE AT STATION 774+41.49 -L3-

1.0 GENERAL

Maintain traffic on <u>US 74 Business (-Y2-)</u> as shown in Traffic Control Plans and as directed by the Engineer.

Provide a minimum temporary vertical clearance of 16'-6" at all times during construction.

Submit plans and calculations for review and approval for protecting traffic and bracing girders, as described herein, at the above station before beginning work at this location. Have the drawings and design calculations prepared, signed, and sealed by a North Carolina Registered Professional Engineer. The approval of the Engineer will not relieve the Contractor of the responsibility for the safety of the method or equipment.

2.0 PROTECTION OF TRAFFIC

Protect traffic from any operation that affords the opportunity for construction materials, equipment, tools, etc. to be dropped into the path of traffic beneath the structure. Based on Contractor means and methods determine and clearly define all dead and live loads for this system, which, at a minimum, shall be installed between beams or girders over any travelway or shoulder area where traffic is maintained. Install the protective system before beginning any construction operations over traffic. In addition, for these same areas, keep the overhang falsework in place until after the rails have been poured.

3.0 Bracing Girders

Brace girders to resist wind forces, weight of forms and other temporary loads, especially those eccentric to the vertical axis of the member during all stages of erection and construction. Before casting of intermediate diaphragms, decks, or connecting steel diaphragms do not allow the horizontal movement of girders to exceed ½ inch.

4.0 BASIS OF PAYMENT

Payment at the contract unit prices for the various pay items will be full compensation for the above work.

STEEL REINFORCED ELASTOMERIC BEARINGS

(6-22-16)

The 2018 Standard Specifications shall be revised as follows:

In **Section 1079-2(A)** – **Elastomeric Bearings** add the following after the second paragraph:

Internal holding pins are required for all shim plates when the contract plans indicate the structure contains the necessary corrosion protection for a corrosive site.

Repair laminated (reinforced) bearing pads utilizing external holding pins via vulcanization. Submit product data for repair material and a detailed application procedure to the Materials and Tests Unit for approval before use and annually thereafter.

THERMAL SPRAYED COATINGS (METALLIZATION)

(12-1-2017)

1.0 DESCRIPTION

Apply a thermal sprayed coating (TSC) and sealer to metal surfaces in accordance with the Thermal Sprayed Coatings (Metallization) Program and as specified herein when called for on the plans or by other Special Provisions. Use only Arc Sprayed application methods to apply TSC. The Engineer must approve other methods of application.

The Thermal Sprayed Coatings (Metallization) Program is available on the Materials and Tests Unit website.

2.0 QUALIFICATIONS

Only use NCDOT approved TSC Contractors meeting the requirements outlined in the Thermal Sprayed Coatings (Metallization) Program.

3.0 MATERIALS

Use only materials meeting the requirements of Section 7 of the Thermal Sprayed Coatings (Metallization) Program.

4.0 SURFACE PREPARATION AND TSC APPLICATION

Surface preparation of TSC surfaces shall meet the requirements of Section 8 of the Thermal Sprayed Coatings (Metallization) Program. Apply TSC with the alloy to the thickness specified on the plans or as required by Thermal Sprayed Coatings (Metallization) Program.

5.0 Inspection and Testing

The TSC Contractor must conduct inspections and tests listed in the Thermal Sprayed Coatings (Metallization) Program.

6.0 REPAIRS

Perform all shop repairs in accordance with the procedures outlined in the Thermal Sprayed Coatings (Metallization) Program.

Repairs associated with field welding shall be made by removing the existing metallizing by blast or power tool cleaning. Affected areas shall be addressed as follows:

• For Marine Environments, incorporate a minimum surface preparation in accordance with SSPC SP-11 (Power Tool Cleaning to Bare Metal) and require an approved epoxy mastic coating applied in accordance with the manufacturer's recommendation. Apply a minimum of two (2) coats at a rate of 5-7 (WFT) per coat to the affected area.

- For Non-Marine Environments, incorporate a minimum surface preparation in accordance with SSPC SP-11 (Power Tool Cleaning to Bare Metal) and require an approved organic zinc-rich coating applied in accordance with the manufacturer's recommendation. Apply a minimum of two (2) coats at a rate of 5-7 (WFT) per coat to the affected area.
 - 1. Minor localized areas less than or equal to 0.1 ft² with exposed substrate shall be repaired as outlined above for marine and non-marine environments.
 - 2. Large localized areas greater than 0.1 ft² with exposed substrate shall require the Contractor to submit a detailed repair procedure to the Engineer for review and approval.
- Repair methods for areas where the substrate has not been exposed shall be mutually agreed upon between the Contractor and TSC Contractor as approved by the Engineer.

7.0 TWELVE MONTH OBSERVATION PERIOD

All TSC materials applied under the Thermal Sprayed Coatings (Metallization) Program shall be evaluated twelve (12) months after project acceptance for defective materials and workmanship.

8.0 BASIS OF PAYMENT

The contract price bid for the metal component to which the TSC is applied will be full compensation for the thermal sprayed coating.

SOUND BARRIER WALL

(8-29-19)

1.0 DESCRIPTION

This work consists of furnishing precast panels with an architectural surface treatment, structural steel, concrete, handling, transporting, fabricating, galvanizing, storing materials, furnishing erection drawings, pile excavation, backfilling, erecting and installing the sound barrier wall members and all other materials as required by the plans, Standard Specifications and this Special Provision.

Precast panels with an architectural surface treatment shall be constructed using form lining materials and patterns to match the appearance (size, shape, color, texture, pattern, and relief) of the textured finish as specified on the plans and approved by the Engineer.

The contractor is required to use the same form liner and coloration contractor to construct the precast panels with an architectural surface treatment.

The Standard Plans allow pile spacing of 10, 15 or 20 feet. Pile spacing greater than 15 feet will not be allowed for the precast concrete panels detailed in the standard plans. Provide consistent pile spacing for the entire length of the wall. Use odd pile spacing, if necessary, only at the ends of the wall and at turning points as approved by the Engineer. Architectural surface treatment shall not be applied to piles. Piles shall have a smooth, non-textured finish, and remain unstained in their natural color.

A maximum one foot drop or rise in elevation between wall sections is permitted. Elevation changes greater than one foot, if necessary, will be allowed only at the end of the wall. Top of wall elevation changes that result in a jagged appearance will not be allowed.

2.0 QUALIFICATIONS

Prior to beginning work the contractor shall submit the following qualifications to the Engineer for approval:

A. Architectural Surface Treatment Construction

The Contractor shall have a minimum of three years of experience in architectural concrete surface treatment construction on similar types of projects. The Contractor shall furnish to the Engineer 3 references who were responsible for supervision of similar projects. Include name, address, telephone number, and specific type of application.

B. Form Liners and Coloring System

The manufacturer of form liners for the standard textured finishes and coloring system shall have at least five years of experience making molds and color stains to create formed concrete surfaces to match the specified textured finish and colors. The Contractor shall schedule a pre-installation conference with a form liner manufacturer

representative and the Engineer to assure understanding of simulated textured finish form liner use, color application, requirements for construction of sample panel(s), and to coordinate the work. The Contractor shall be required to disclose their source of form liner manufacturer and final coloration contractor prior to the Preconstruction Conference.

3.0 ALTERNATE PILE SPACING FOR STANDARD PRECAST PANELS

As an alternate, the Contractor may submit plans for pile spacings greater than 10 feet and less than 15 feet for review and approval. The pile excavation diameter, excavation depth and reinforcing steel shall be equal to the amount shown on the existing plans for the 15 feet pile spacing. A variance in the reinforcing steel will be allowed for the length of horizontal and number of vertical reinforcement bars in the precast panel for the alternate pile spacing.

Submit two sets of detailed plans for review. Include all details in the plans, including the size and spacing of required reinforcement necessary to fabricate the precast panels. Have a North Carolina registered Professional Engineer check, seal and date the plans. After the plans are reviewed and, if necessary, corrections made, submit one set of reproducible tracings on 22" x 34" sheets to become part of the contract plans.

4.0 ALTERNATE WALL TYPE

Walls that have been assigned "Approved" or "Approved for Provisional Use" status by the Product Evaluation Program will be considered for substitution to the detailed Standard Sound Barrier Wall only when noted on the plans. Alternate wall types, piles and pile spacing must meet the design and construction requirements of the project. Pile spacing greater than 20 feet will not be permitted. Alternate pile and wall structural stability and connection details shall conform to the current edition of the AASHTO LRFD Bridge Design Specifications.

Prior to submittal of Working Drawings, as described herein, submit a copy of the signed NCDOT Product Status Notification Letter and two sets of preliminary plans for review and approval. Include material specifications for all components. Once preliminary plans are approved, submit Working Drawings in accordance with all applicable portions of the requirements herein, including details necessary to fabricate and construct the proposed alternate.

Have a North Carolina registered Professional Engineer check, seal and date the plans and, when requested, provide calculations. After the plans are reviewed and, if necessary, corrections made, submit one set of reproducible tracings on 22" x 34" sheets to become part of the contract plans.

5.0 WORKING DRAWINGS

Submit precast panel casting drawings in accordance with Article 1077-2 of the Standard Specifications prior to casting. Show the inserts, method of handling, and support details

used for transportation on the casting drawings. Submit fabrication drawings for approval prior to fabrication of wall components. Submit an erection plan and precast panel placing plan, including location of various heights of panels, for review and acceptance prior to fabrication of forms. Submit five sets of detail drawings on 22" x 34" sheets.

Submit for review and acceptance, wall plan and elevation views and details showing overall simulated textured pattern, joint locations, and end, edge or other special conditions. The drawings should include typical cross sections of precast panels, joints, corners, texture relief, texture size, pitch/working line, mortar joint and bed depths. If necessary, the Contractor shall revise the working drawings until the proposed form liner patterns and arrangement have been accepted by the Engineer. Working drawings should be of sufficient scale to show the detail of all textured finishes and joint patterns. Shop drawings shall be reviewed and approved prior to fabrication of form liners.

6.0 MATERIALS AND FABRICATION OF STANDARD PRECAST PANELS

Provide materials and fabricate members in accordance with the requirements of Division 10 of the Standard Specifications for Roads and Structures. Provide precast panels 4 inches \pm ½ inch thick, excluding relief for a textured finish. Architectural surface treatment shall consist of a standard textured finish and a single color of stain applied to both faces of the precast panels as specified on the plans and approved by the Engineer. Relief of any texture is not to exceed an average depth of 1 inch. No textured finish or stain shall be applied on the uppermost foot of each wall segment and along the vertical edges of the panels. These areas shall have a smooth, non-textured finish, and remain in its natural concrete color.

Furnish three 12" x 12" samples for approval which establish the acceptable variations in color, texture, and uniformity. After the color, texture, and uniformity of the furnished samples are approved, produce a full scale panel unit meeting design requirements. This mock-up and the furnished samples establish the standard quality for determining acceptance of the panels. When producing the final installed panels, use fine and coarse aggregate, retarder, and cement from the same source as those used in the approved sample panels.

The standard textured finish shall be constructed using form lining materials. The form liner shall be a high quality, re-useable product manufactured of high strength urethane rubber or other approved material which attaches easily to the form work system, and shall not compress more than ¼ inch when concrete is poured at a rate of 10 vertical feet per hour. The form liners shall be removable without causing deterioration of the surface or underlying concrete.

The form liner shall be patterned such that long continuous horizontal or vertical lines do not occur on the finished exposed surface. The line pattern shall be random in nature and shall conceal construction joint lines.

Prior to each concrete pour, the form liners shall be clean and free of build-up. Each liner shall be visually inspected for blemishes and tears. Repairs shall be made in accordance with the manufacturer's recommendations. Repairs shall be accepted by the Engineer before being used. Form liner panels that do not perform as intended or are no longer repairable shall be replaced.

Form liners shall be securely attached to forms in accordance with the manufacturer's recommendations, with less than a ¼ inch seam. Blend form liner butt joints into the textured surface pattern and finish off the final concrete surface. Create no visible vertical or horizontal seams or conspicuous form liner butt joint marks. At locations where the form liners are joined, carefully blend to match the balance of the textured finish.

Form liners shall be installed to withstand anticipated concrete placement pressures without leakage and without causing physical or visual defects.

When the approved textured finish requires simulated grout pattern joints, construct grout pattern joints to simulate the appearance of mortared joints produced in laid up masonry work. Grout pattern joints shall be produced in accordance with the form liner / concrete color system manufacturer.

The Contractor shall have a technical representative from the form liner manufacturer on site for technical supervision during the installation and removal of form liners. Unless directed by the Engineer, installation and removal of form liners shall not be permitted if the technical representative is not present.

Form release agent shall be a non-staining petroleum distillate free from water, asphaltic, and other insoluble residue, or an equivalent product and shall be applied in accordance with the manufacturer's recommendations. The form release agent shall be compatible with the form liner material, the concrete coloring system, any special surface finish and in accordance with this Special Provision. Form release agent should be worked into all areas, especially pattern recesses.

All form defects in finished uncolored surface shall be filled or repaired within 48 hours of form removal. Use patching materials and procedures in accordance with the manufacturer's recommendations.

Precast concrete shall be finished in accordance with the Standard Specifications, except that curing of concrete should been done to accommodate the application of coloring and surface finish treatment.

7.0 SURFACE COLORING

All surfaces that are to receive coloring agent application shall be free of all laitance, dirt, dust, grease, efflorescence, paint or any other foreign material prior to the application of coloring agent. Cleaning of surfaces to be accomplished by pressure washing with water set at 3,000 psi to remove laitance. The fan nozzle shall be held perpendicular to the surface at a distance of 1 to 2 feet. Sandblasting will not be permitted.

Surface coloring shall be achieved using an approved stain suitable for the purpose intended and applied in a manner consistent with the design intent of the project. Color system shall be a single color of stain in brown or gray tones as specified on the plans and approved by the Engineer. The approved sample panel shall be the basis for determining the appropriate stain application.

The coloring agent shall be a penetrating stain mix or other approved coloring system designed for exterior application on old or new concrete with field evidence of resistance to moisture, acid or alkali, mildew, mold or fungus discoloration or degradation. The coloring agent shall be breathable, allowing moisture and vapor transmission. Final coloring system and color of stain are subject to approval by the Engineer.

Application of coloring/staining agent to finished precast concrete and patches shall occur at a minimum of 30 days after form liners are removed. Maintain the concrete temperature between 40°F and 85°F during color/stain application and for 48 hours after color/stain application. Consult the manufacturer's recommendations for preparation, application, curing, and storage of coloring agents/stains. The contractor shall provide a Color Application Artist who is experienced in producing realistic surface appearances. Treated surfaces located adjacent to exposed soil or pavement shall be temporarily covered to prevent dirt or soil splatter from rain.

Final surface shall be free of blemishes, discolorations, surface voids, and other irregularities. All patterns should be continuous without visual disruption. Linear butt joints shall be carefully blended into the approved pattern and finished off the final concrete surface. No visible vertical or horizontal seams or conspicuous form marks created by butt joining will be permitted.

Following the completion of all work, repairs of any damage made by other construction operations shall be made to the form lined and colored surfaces as directed by the Engineer.

8.0 Construction Methods

Complete the final survey of existing ground profile after clearing the wall area but prior to submitting any working drawings. Submit the final groundline survey with the working drawings.

If the Department is responsible for the survey, the Engineer field verifies the existing ground profile along the sound barrier wall. Contact the Engineer to obtain the survey information. Otherwise, complete the existing ground survey prior to submittal of working drawings.

Excavate holes with the diameters shown on the plans. Perform pile excavation to the depths shown on the plans and install piles as shown on the plans or in the accepted submittals with a tolerance of ½ inch per foot from vertical. Backfill excavations with concrete after placing piles.

A. Pile Excavation

Use equipment of adequate capacity and capable of drilling through soil and non-soil including rock, boulders, debris, man-made objects and any other materials encountered. Blasting is not permitted to advance the excavation. Blasting for core removal is only permitted when approved by the Engineer. Dispose of drilling spoils in accordance with Section 802 of the Standard Specifications and as directed by the Engineer. Drilling spoils consist of all excavated material including water removed from the excavation either by pumping or drilling tools.

If unstable, caving or sloughing soils are anticipated or encountered, stabilize excavations with either slurry or steel casing. When using slurry, submit slurry details including product information, manufacturer's recommendations for use, slurry equipment information and written approval from the slurry supplier that the mixing water is acceptable before beginning drilling. When using steel casing, use either the sectional type or one continuous corrugated or non-corrugated piece. Steel casings should consist of clean watertight steel of ample strength to withstand handling and driving stresses and the pressures imposed by concrete, earth or backfill. Use steel casings with an outside diameter equal to the hole size and a minimum wall thickness of ½ inch.

B. Concrete Placement

Before placing concrete, center and support the pile in the excavation and check the water inflow rate in the excavation after any pumps have been removed. If the inflow rate is less than 6 inches per half hour, remove any water and free fall the concrete into the excavation. Ensure that concrete flows completely around the pile. If the water inflow rate is greater than 6 inches per half hour, propose a concrete placement procedure to the Engineer. The Engineer shall approve the concrete placement procedure before placing concrete.

Fill the excavation with Class A concrete in accordance with Section 1000 of the Standard Specifications except as modified herein. Provide concrete with a slump of 6 to 8 inches. Use an approved high-range water reducer to achieve this slump. Place concrete in a continuous manner and remove all casings.

9.0 METHOD OF MEASUREMENT

The quantity of form liner textured finish and coloring stain to be paid for will be the actual square feet of architectural surface treatment that has been incorporated into the completed and accepted work. The area of architectural surface treatment will be measured by the area of treated panels. Do not include the uppermost foot of each wall segment, panel vertical edges without architectural surface treatment, or piles in the measurement. Area of sample panels shall not be included in the measurement of architectural surface treatment.

The quantity of sound barrier wall to be paid for will be the actual square feet of completed and accepted wall. In any individual section of sound barrier wall or in comparably dimensioned sections, the wall height is from the bottom of the bottom panel to the top of

the top panel and the width is the distance between the centerline of the piles at the ends of the section. Include the full width of the piles at the ends of the wall.

10.0 BASIS OF PAYMENT

The quantity of sound barrier wall and architectural surface treatment, measured as provided above, will be paid for at the contract unit price bid per square foot.

The unit price bid per square foot for "Sound Barrier Wall" will be full compensation for work covered by this Special Provision including, but not limited to, furnishing precast panels, steel or concrete piles, miscellaneous structural steel, concrete, and all other materials; handling, transporting, fabricating, galvanizing, and storing materials; furnishing erection drawings, backfilling, pile excavation including any casing or slurry, and erecting and installing the sound barrier wall members.

The unit price bid per square foot for "Architectural Surface Treatment" will be full compensation for the architectural treatment covered by this Special Provision including, but not limited to, furnishing architectural detail drawings, sample panels; the construction, finishing, and removal of all equipment, materials, labor, and incidentals necessary for furnishing and use of all form liners to produce approved textured finish and application of approved surface coloring.

Payment will be made under:		
Sound Barrier Wall		Square Foot
Architectural Surface Treats	ment (Sound Barrier Wall)	Square Foot

FALSEWORK AND FORMWORK

(4-5-12)

1.0 DESCRIPTION

Use this Special Provision as a guide to develop temporary works submittals required by the Standard Specifications or other provisions; no additional submittals are required herein. Such temporary works include, but are not limited to, falsework and formwork.

Falsework is any temporary construction used to support the permanent structure until it becomes self-supporting. Formwork is the temporary structure or mold used to retain plastic or fluid concrete in its designated shape until it hardens. Access scaffolding is a temporary structure that functions as a work platform that supports construction personnel, materials, and tools, but is not intended to support the structure. Scaffolding systems that are used to temporarily support permanent structures (as opposed to functioning as work platforms) are considered to be falsework under the definitions given. Shoring is a component of falsework such as horizontal, vertical, or inclined support members. Where the term "temporary works" is used, it includes all of the temporary facilities used in bridge construction that do not become part of the permanent structure.

Design and construct safe and adequate temporary works that will support all loads imposed and provide the necessary rigidity to achieve the lines and grades shown on the plans in the final structure.

2.0 MATERIALS

Select materials suitable for temporary works; however, select materials that also ensure the safety and quality required by the design assumptions. The Engineer has authority to reject material on the basis of its condition, inappropriate use, safety, or nonconformance with the plans. Clearly identify allowable loads or stresses for all materials or manufactured devices on the plans. Revise the plan and notify the Engineer if any change to materials or material strengths is required.

3.0 DESIGN REQUIREMENTS

A. Working Drawings

Provide working drawings for items as specified in the contract, or as required by the Engineer, with design calculations and supporting data in sufficient detail to permit a structural and safety review of the proposed design of the temporary work.

On the drawings, show all information necessary to allow the design of any component to be checked independently as determined by the Engineer.

When concrete placement is involved, include data such as the drawings of proposed sequence, rate of placement, direction of placement, and location of all construction joints. Submit the number of copies as called for by the contract.

When required, have the drawings and calculations prepared under the guidance of, and sealed by, a North Carolina Registered Professional Engineer who is knowledgeable in temporary works design.

If requested by the Engineer, submit with the working drawings manufacturer's catalog data listing the weight of all construction equipment that will be supported on the temporary work. Show anticipated total settlements and/or deflections of falsework and forms on the working drawings. Include falsework footing settlements, joint take-up, and deflection of beams or girders.

As an option for the Contractor, overhang falsework hangers may be uniformly spaced, at a maximum of 36 inches, provided the following conditions are met:

Member Type (PCG)	Member Depth, (inches)	Max. Overhang Width, (inches)	Max. Slab Edge Thickness, (inches)	Max. Screed Wheel Weight, (lbs.)	Bracket Min. Vertical Leg Extension, (inches)
II	36	39	14	2000	26
III	45	42	14	2000	35
IV	54	45	14	2000	44
MBT	63	51	12	2000	50
MBT	72	55	12	1700	48

Overhang width is measured from the centerline of the girder to the edge of the deck slab.

For Type II, III & IV prestressed concrete girders (PCG), 45-degree cast-in-place half hangers and rods must have a minimum safe working load of 6,000 lbs.

For MBT prestressed concrete girders, 45-degree angle holes for falsework hanger rods shall be cast through the girder top flange and located, measuring along the top of the member, 1'-2 ½" from the edge of the top flange. Hanger hardware and rods must have a minimum safe working load of 6,000 lbs.

The overhang bracket provided for the diagonal leg shall have a minimum safe working load of 3,750 lbs. The vertical leg of the bracket shall extend to the point that the heel bears on the girder bottom flange, no closer than 4 inches from the bottom of the member. However, for 72-inch members, the heel of the bracket shall bear on the web, near the bottom flange transition.

Provide adequate overhang falsework and determine the appropriate adjustments for deck geometry, equipment, casting procedures and casting conditions.

If the optional overhang falsework spacing is used, indicate this on the falsework submittal and advise the girder producer of the proposed details. Failure to notify the

Engineer of hanger type and hanger spacing on prestressed concrete girder casting drawings may delay the approval of those drawings.

Falsework hangers that support concentrated loads and are installed at the edge of thin top flange concrete girders (such as bulb tee girders) shall be spaced so as not to exceed 75% of the manufacturer's stated safe working load. Use of dual leg hangers (such as Meadow Burke HF-42 and HF-43) are not allowed on concrete girders with thin top flanges. Design the falsework and forms supporting deck slabs and overhangs on girder bridges so that there will be no differential settlement between the girders and the deck forms during placement of deck concrete.

When staged construction of the bridge deck is required, detail falsework and forms for screed and fluid concrete loads to be independent of any previous deck pour components when the mid-span girder deflection due to deck weight is greater than ³/₄".

Note on the working drawings any anchorages, connectors, inserts, steel sleeves or other such devices used as part of the falsework or formwork that remains in the permanent structure. If the plan notes indicate that the structure contains the necessary corrosion protection required for a Corrosive Site, epoxy coat, galvanize or metalize these devices. Electroplating will not be allowed. Any coating required by the Engineer will be considered incidental to the various pay items requiring temporary works.

Design falsework and formwork requiring submittals in accordance with the 1995 AASHTO *Guide Design Specifications for Bridge Temporary Works* except as noted herein.

1. Wind Loads

Table 2.2 of Article 2.2.5.1 is modified to include wind velocities up to 110 mph. In addition, Table 2.2A is included to provide the maximum wind speeds by county in North Carolina.

Pressure, lb/ft² for Indicated Wind Velocity, mph Height Zone 70 80 feet above ground 90 100 110 0 to 30 15 20 25 30 35 20 25 30 35 40 30 to 50 50 to 100 25 30 35 40 45 over 100 30 35 40 45 50

Table 2.2 - Wind Pressure Values

2. Time of Removal

The following requirements replace those of Article 3.4.8.2.

Do not remove forms until the concrete has attained strengths required in Article 420-16 of the Standard Specifications and these Special Provisions.

Do not remove forms until the concrete has sufficient strength to prevent damage to the surface.

Table 2.2A - Steady State Maximum Wind Speeds by Counties in North Carolina

COUNTY	25 YR (mph)	COUNTY	25 YR (mph)	COUNTY	25 YR (mph)
Alamance	70	Franklin	70	Pamlico	100
Alexander	70	Gaston	70	Pasquotank	100
Alleghany	70	Gates	90	Pender	100
Anson	70	Graham	80	Perquimans	100
Ashe	70	Granville	70	Person	70
Avery	70	Greene	80	Pitt	90
Beaufort	100	Guilford	70	Polk	80
Bertie	90	Halifax	80	Randolph	70
Bladen	90	Harnett	70	Richmond	70
Brunswick	100	Haywood	80	Robeson	80
Buncombe	80	Henderson	80	Rockingham	70
Burke	70	Hertford	90	Rowan	70
Cabarrus	70	Hoke	70	Rutherford	70
Caldwell	70	Hyde	110	Sampson	90
Camden	100	Iredell	70	Scotland	70
Carteret	110	Jackson	80	Stanley	70
Caswell	70	Johnston	80	Stokes	70
Catawba	70	Jones	100	Surry	70
Cherokee	80	Lee	70	Swain	80
Chatham	70	Lenoir	90	Transylvania	80
Chowan	90	Lincoln	70	Tyrell	100
Clay	80	Macon	80	Union	70
Cleveland	70	Madison	80	Vance	70
Columbus	90	Martin	90	Wake	70
Craven	100	McDowell	70	Warren	70
Cumberland	80	Mecklenburg	70	Washington	100
Currituck	100	Mitchell	70	Watauga	70
Dare	110	Montgomery	70	Wayne	80
Davidson	70	Moore	70	Wilkes	70
Davie	70	Nash	80	Wilson	80
Duplin	90	New Hanover	100	Yadkin	70
Durham	70	Northampton	80	Yancey	70
Edgecombe	80	Onslow	100	_	
Forsyth	70	Orange	70		

B. Review and Approval

The Engineer is responsible for the review and approval of temporary works' drawings.

Submit the working drawings sufficiently in advance of proposed use to allow for their review, revision (if needed), and approval without delay to the work.

The time period for review of the working drawings does not begin until complete drawings and design calculations, when required, are received by the Engineer.

Do not start construction of any temporary work for which working drawings are required until the drawings have been approved. Such approval does not relieve the Contractor of the responsibility for the accuracy and adequacy of the working drawings.

4.0 CONSTRUCTION REQUIREMENTS

All requirements of Section 420 of the Standard Specifications apply.

Construct temporary works in conformance with the approved working drawings. Ensure that the quality of materials and workmanship employed is consistent with that assumed in the design of the temporary works. Do not weld falsework members to any portion of the permanent structure unless approved. Show any welding to the permanent structure on the approved construction drawings.

Provide tell-tales attached to the forms and extending to the ground, or other means, for accurate measurement of falsework settlement. Make sure that the anticipated compressive settlement and/or deflection of falsework does not exceed 1 inch. For cast-in-place concrete structures, make sure that the calculated deflection of falsework flexural members does not exceed 1/240 of their span regardless of whether or not the deflection is compensated by camber strips.

A. Maintenance and Inspection

Inspect and maintain the temporary work in an acceptable condition throughout the period of its use. Certify that the manufactured devices have been maintained in a condition to allow them to safely carry their rated loads. Clearly mark each piece so that its capacity can be readily determined at the job site.

Perform an in-depth inspection of an applicable portion(s) of the temporary works, in the presence of the Engineer, not more than 24 hours prior to the beginning of each concrete placement. Inspect other temporary works at least once a month to ensure that they are functioning properly. Have a North Carolina Registered Professional Engineer inspect the cofferdams, shoring, sheathing, support of excavation structures, and support systems for load tests prior to loading.

B. Foundations

Determine the safe bearing capacity of the foundation material on which the supports for temporary works rest. If required by the Engineer, conduct load tests to verify proposed bearing capacity values that are marginal or in other high-risk situations.

The use of the foundation support values shown on the contract plans of the permanent structure is permitted if the foundations are on the same level and on the same soil as those of the permanent structure.

Allow for adequate site drainage or soil protection to prevent soil saturation and washout of the soil supporting the temporary works supports.

If piles are used, the estimation of capacities and later confirmation during construction using standard procedures based on the driving characteristics of the pile is permitted. If preferred, use load tests to confirm the estimated capacities; or, if required by the Engineer conduct load tests to verify bearing capacity values that are marginal or in other high risk situations.

The Engineer reviews and approves the proposed pile and soil bearing capacities.

5.0 REMOVAL

Unless otherwise permitted, remove and keep all temporary works upon completion of the work. Do not disturb or otherwise damage the finished work.

Remove temporary works in conformance with the contract documents. Remove them in such a manner as to permit the structure to uniformly and gradually take the stresses due to its own weight.

6.0 METHOD OF MEASUREMENT

Unless otherwise specified, temporary works will not be directly measured.

7.0 BASIS OF PAYMENT

Payment at the contract unit prices for the various pay items requiring temporary works will be full compensation for the above falsework and formwork.

SUBMITTAL OF WORKING DRAWINGS

(1-29-21)

1.0 GENERAL

Submit working drawings in accordance with Article 105-2 of the *Standard Specifications* and this provision. For this provision, "submittals" refers to only those listed in this provision. The list of submittals contained herein does not represent a list of required submittals for the project. Submittals are only necessary for those items as required by the contract. Make submittals that are not specifically noted in this provision directly to the Engineer. Either the Structures Management Unit or the Geotechnical Engineering Unit or both units will jointly review submittals.

If a submittal contains variations from plan details or specifications or significantly affects project cost, field construction or operations, discuss the submittal with and submit all copies to the Engineer. State the reason for the proposed variation in the submittal. To minimize review time, make sure all submittals are complete when initially submitted. Provide a contact name and information with each submittal. Direct any questions regarding submittal requirements to the Engineer, Structures Management Unit contacts or the Geotechnical Engineering Unit contacts noted below.

In order to facilitate in-plant inspection by NCDOT and approval of working drawings, provide the name, address and telephone number of the facility where fabrication will actually be done if different than shown on the title block of the submitted working drawings. This includes, but is not limited to, precast concrete items, prestressed concrete items and fabricated steel or aluminum items.

2.0 ADDRESSES AND CONTACTS

For submittals to the Structures Management Unit, use the following addresses:

Via US mail:

Mr. B. C. Hanks, P. E. State Structures Engineer North Carolina Department of Transportation Structures Management Unit

1581 Mail Service Center Raleigh, NC 27699-1581

Attention: Mr. J. L. Bolden, P. E.

Submittals may also be made via email.

Send submittals to:

<u>ilbolden@ncdot.gov</u> (James Bolden)

Send an additional e-copy of the submittal to the following address:

<u>eomile@ncdot.gov</u> (Emmanuel Omile)

Via other delivery service:

Mr. B. C. Hanks, P. E. State Structures Engineer North Carolina Department

of Transportation

Structures Management Unit 1000 Birch Ridge Drive Raleigh, NC 27610

Attention: Mr. J. L. Bolden, P. E.

raieign, 110 27010

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mrorie@ncdot.gov (Madonna Rorie)

For submittals to the Geotechnical Engineering Unit, use the following addresses:

For projects in Divisions 1-7, use the following Eastern Regional Office address:

Via US mail: Via other delivery service:

Mr. David Hering, L. G., P. E.

Eastern Regional Geotechnical

Mr. David Hering, L. G., P. E.

Eastern Regional Geotechnical

Manager Manager

North Carolina Department North Carolina Department

of Transportation of Transportation

Geotechnical Engineering Unit Geotechnical Engineering Unit

Eastern Regional Office Eastern Regional Office

1570 Mail Service Center 3301 Jones Sausage Road, Suite 100

Raleigh, NC 27699-1570 Garner, NC 27529

Via Email: <u>EastGeotechnicalSubmittal@ncdot.gov</u>

For projects in Divisions 8-14, use the following Western Regional Office address:

Via US mail or other delivery service:

Mr. Eric Williams, P. E.

Western Regional Geotechnical

Manager

North Carolina Department

of Transportation

Geotechnical Engineering Unit

Western Regional Office

5253 Z Max Boulevard

Harrisburg, NC 28075

Via Email: WestGeotechnicalSubmittal@ncdot.gov

The status of the review of structure-related submittals sent to the Structures Management Unit can be viewed from the Unit's website, via the "Drawing Submittal Status" link.

The status of the review of geotechnical-related submittals sent to the Geotechnical Engineering Unit can be viewed from the Unit's website, via the "Geotechnical Construction Submittals" link.

Direct any questions concerning submittal review status, review comments or drawing markups to the following contacts:

Primary Structures Contact: James Bolden (919) 707 – 6408

(919) 250 - 4082 facsimile

ilbolden@ncdot.gov

Secondary Structures Contacts: Emmanuel Omile (919) 707 – 6451

Madonna Rorie (919) 707 – 6508

Eastern Regional Geotechnical Contact (Divisions 1-7):

David Hering (919) 662 – 4710 dthering@ncdot.gov

Western Regional Geotechnical Contact (Divisions 8-14):

Eric Williams (704) 455 – 8902 ewilliams3@ncdot.gov

3.0 SUBMITTAL COPIES

Furnish one complete copy of each submittal, including all attachments, to the Engineer. At the same time, submit the number of hard copies shown below of the same complete submittal directly to the Structures Management Unit and/or the Geotechnical Engineering Unit.

The first table below covers "Structure Submittals". The Engineer will receive review comments and drawing markups for these submittals from the Structures Management Unit. The second table in this section covers "Geotechnical Submittals". The Engineer will receive review comments and drawing markups for these submittals from the Geotechnical Engineering Unit.

Unless otherwise required, submit one set of supporting calculations to either the Structures Management Unit or the Geotechnical Engineering Unit unless both units require submittal copies in which case submit a set of supporting calculations to each unit. Provide additional copies of any submittal as directed.

STRUCTURE SUBMITTALS

Submittal	Copies Required by Structures Management Unit	Copies Required by Geotechnical Engineering Unit	Contract Reference Requiring Submittal ¹
Arch Culvert Falsework	5	0	Plan Note, SN Sheet & "Falsework and Formwork"
Box Culvert Falsework ⁷	5	0	Plan Note, SN Sheet & "Falsework and Formwork"
Cofferdams	6	2	Article 410-4
Foam Joint Seals ⁶	9	0	"Foam Joint Seals"

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	D1-23		
Project R-2233BB			Rutherford County
Expansion Joint Seals (hold down plate type with base angle)	9	0	"Expansion Joint Seals"
Expansion Joint Seals (modular)	2, then 9	0	"Modular Expansion Joint Seals"
Expansion Joint Seals (strip seals)	9	0	"Strip Seals"
Falsework & Forms ² (substructure)	8	0	Article 420-3 & "Falsework and Formwork"
Falsework & Forms (superstructure)	8	0	Article 420-3 & "Falsework and Formwork"
Girder Erection over Railroad	5	0	Railroad Provisions
Maintenance and Protection of Traffic Beneath Proposed Structure	8	0	"Maintenance and Protection of Traffic Beneath Proposed Structure at Station"
Metal Bridge Railing	8	0	Plan Note
Metal Stay-in-Place Forms	8	0	Article 420-3
Metalwork for Elastomeric Bearings ^{4,5}	7	0	Article 1072-8
Miscellaneous Metalwork ^{4,5}	7	0	Article 1072-8
Disc Bearings ⁴	8	0	"Disc Bearings"
Overhead and Digital Message Signs (DMS) (metalwork and foundations)	13	0	Applicable Provisions
Placement of Equipment on Structures (cranes, etc.)	7	0	Article 420-20
Precast Concrete Box Culverts	2, then 1 reproducible	0	"Optional Precast Reinforced Concrete Box Culvert at Station"
Prestressed Concrete Cored Slab (detensioning sequences) ³	6	0	Article 1078-11
Prestressed Concrete Deck Panels	6 and 1 reproducible	0	Article 420-3

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Project R-2233BB			Rutherford County
Prestressed Concrete Girder (strand elongation and detensioning sequences)	6	0	Articles 1078-8 and 1078- 11
Removal of Existing Structure over Railroad	5	0	Railroad Provisions
Revised Bridge Deck Plans (adaptation to prestressed deck panels)	2, then 1 reproducible	0	Article 420-3
Revised Bridge Deck Plans (adaptation to modular expansion joint seals)	2, then 1 reproducible	0	"Modular Expansion Joint Seals"
Sound Barrier Wall (precast items)	10	0	Article 1077-2 & "Sound Barrier Wall"
Sound Barrier Wall Steel Fabrication Plans ⁵	7	0	Article 1072-8 & "Sound Barrier Wall"
Structural Steel ⁴	2, then 7	0	Article 1072-8
Temporary Detour Structures	10	2	Article 400-3 & "Construction, Maintenance and Removal of Temporary Structure at Station"
TFE Expansion Bearings ⁴	8	0	Article 1072-8

FOOTNOTES

- 1. References are provided to help locate the part of the contract where the submittals are required. References in quotes refer to the provision by that name. Articles refer to the *Standard Specifications*.
- 2. Submittals for these items are necessary only when required by a note on plans.
- 3. Submittals for these items may not be required. A list of pre-approved sequences is available from the producer or the Materials & Tests Unit.
- 4. The fabricator may submit these items directly to the Structures Management Unit.
- 5. The two sets of preliminary submittals required by Article 1072-8 of the *Standard Specifications* are not required for these items.
- 6. Submittals for Fabrication Drawings are not required. Submittals for Catalogue Cuts of Proposed Material are required. See Section 5.A of the referenced provision.
- 7. Submittals are necessary only when the top slab thickness is 18" or greater.

GEOTECHNICAL SUBMITTALS

Submittal	Copies Required by Geotechnical Engineering Unit	Copies Required by Structures Management Unit	Contract Reference Requiring Submittal ¹
Drilled Pier Construction Plans ²	1	0	Subarticle 411-3(A)
Crosshole Sonic Logging (CSL) Reports ²	1	0	Subarticle 411-5(A)(2)
Pile Driving Equipment Data Forms ^{2,3}	1	0	Subarticle 450-3(D)(2)
Pile Driving Analyzer (PDA) Reports ²	1	0	Subarticle 450-3(F)(3)
Retaining Walls ⁴	1 drawings, 1 calculations	2 drawings	Applicable Provisions
Temporary Shoring ⁴	1 drawings, 1 calculations	2 drawings	"Temporary Shoring" & "Temporary Soil Nail Walls"

FOOTNOTES

- 1. References are provided to help locate the part of the contract where the submittals are required. References in quotes refer to the provision by that name. Subarticles refer to the *Standard Specifications*.
- 2. Submit one hard copy of submittal to the Engineer. Submit a second copy of submittal electronically (PDF via email), US mail or other delivery service to the appropriate Geotechnical Engineering Unit regional office. Electronic submission is preferred.
- 3. The Pile Driving Equipment Data Form is available from: https://connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx See second page of form for submittal instructions.
- 4. Electronic copy of submittal is required. See referenced provision.

CRANE SAFETY (6-20-19)

Comply with the manufacturer specifications and limitations applicable to the operation of any and all cranes and derricks. Prime contractors, sub-contractors, and fully operated rental companies shall comply with the current Occupational Safety and Health Administration (OSHA) regulations.

Submit all items listed below to the Engineer prior to beginning crane operations. Changes in personnel or equipment must be reported to the Engineer and all applicable items listed below must be updated and submitted prior to continuing with crane operations.

CRANE SAFETY SUBMITTAL LIST

- A. <u>Competent Person:</u> Provide the name and qualifications of the "Competent Person" responsible for crane safety and lifting operations. The named competent person will have the responsibility and authority to stop any work activity due to safety concerns.
- B. <u>Riggers:</u> Provide the qualifications and experience of the persons responsible for rigging operations. Qualifications and experience should include, but not be limited to, weight calculations, center of gravity determinations, selection and inspection of sling and rigging equipment, and safe rigging practices.
- C. <u>Crane Inspections:</u> Inspection records for all cranes shall be current and readily accessible for review upon request.
- D. <u>Certifications:</u> Crane operators shall be certified by the National Commission for the Certification of Crane Operators (NCCCO) or the National Center for Construction Education and Research (NCCER). Other approved nationally accredited programs will be considered upon request. In addition, crane operators shall have a current CDL medical card. Submit a list of crane operator(s) and include current certification for each type of crane operated (small hydraulic, large hydraulic, small lattice, large lattice) and medical evaluations for each operator.

GROUT FOR STRUCTURES

(12-1-17)

1.0 DESCRIPTION

This special provision addresses grout for use in pile blockouts, grout pockets, shear keys, dowel holes and recesses for structures. This provision does not apply to grout placed in post-tensioning ducts for bridge beams, girders, decks, end bent caps, or bent caps. Mix and place grout in accordance with the manufacturer's recommendations, the applicable sections of the Standard Specifications and this provision.

2.0 MATERIAL REQUIREMENTS

Unless otherwise noted on the plans, use a Type 3 Grout in accordance with Section 1003 of the Standard Specifications.

Initial setting time shall not be less than 10 minutes when tested in accordance with ASTM C266

Construction loading and traffic loading shall not be allowed until the 3 day compressive strength is achieved.

3.0 SAMPLING AND PLACEMENT

Place and maintain components in final position until grout placement is complete and accepted. Concrete surfaces to receive grout shall be free of defective concrete, laitance, oil, grease and other foreign matter. Saturate concrete surfaces with clean water and remove excess water prior to placing grout.

4.0 BASIS OF PAYMENT

No separate payment will be made for "Grout for Structures". The cost of the material, equipment, labor, placement, and any incidentals necessary to complete the work shall be considered incidental to the structure item requiring grout.

ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES

(12-30-15)

1.0 Inspection for Asbestos Containing Material

Prior to conducting bridge demolition or renovation activities, the Contractor shall thoroughly inspect the bridge or affected components for the presence of asbestos containing material (ACM) using a firm prequalified by NCDOT to perform asbestos surveys. The inspection must be performed by a N.C. accredited asbestos inspector with experience inspecting bridges or other industrial structures. The N.C. accredited asbestos inspector must conduct a thorough inspection, identifying all asbestos-containing material as required by the Environmental Protection Agency National Emission Standards for Hazardous Air Pollutants (NESHAP) Code of Federal Regulations (CFR) 40 CFR, Part 61, Subpart M.

The Contractor shall submit an inspection report to the Engineer, which at a minimum must include information required in 40 CFR 763.85 (a)(4) vi)(A)-(E), as well as a project location map, photos of existing structure, the date of inspection and the name, N.C. accreditation number, and signature of the N.C. accredited asbestos inspector who performed the inspection and completed the report. The cover sheet of the report shall include project identification information. Place the following notes on the cover sheet of the report and check the appropriate box:

ACM	was	found
ACM	was	not found

2.0 REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIAL

If ACM is found, notify the Engineer. Compensation for removal and disposal of ACM is considered extra work in accordance with Article 104-7 of the Standard Specifications.

An Asbestos Removal Permit must be obtained from the Health Hazards Control Unit (HHCU) of the N.C. Department of Health & Human Services, Division of Public Health, if more than 35 cubic feet, 160 square feet, or 260 linear feet of regulated ACM (RACM) is to be removed from a structure and this work must be completed by a contractor prequalified by NCDOT to perform asbestos abatement. RACM is defined in 40 CFR, Part 61, Subpart M. Note: 40 CFR 763.85 (a)(4) vi)(D) defines ACM as surfacing, TSI and Miscellaneous which does not meet the NESHAP RACM.

3.0 DEMOLITION NOTIFICATION

Even if no ACM is found (or if quantities are less than those required for a permit), a Demolition Notification (DHHS-3768) must be submitted to the HHCU. Notifications and Asbestos Permit applications require an original signature and must be submitted to the HHCU 10 working days prior to beginning demolition activities. The 10 working day period starts based on the post-marked date or date of hand delivery. Demolition that does not begin as originally notified requires submission of a separate revision form HHCU

3768-R to HHCU. Reference the North Carolina Administrative Code, Chapter 10A, Subchapter 41C, Article .0605 for directives on revision submissions.

Contact Information

Health Hazards Control Unit (HHCU) N.C. Department of Health and Human Services 1912 Mail Service Center Raleigh, NC 27699-1912 Telephone: (919) 707-5950

Fax: (919) 870-4808

4.0 SPECIAL CONSIDERATIONS

Buncombe, Forsyth, and Mecklenburg counties also have asbestos permitting and NESHAP requirements must be followed. For projects involving permitted RACM removals, both the applicable county and the state (HHCU) must be notified.

For demolitions with no RACM, only the local environmental agencies must be notified. Contact information is as follows:

Buncombe County

WNC Regional Air Pollution Control Agency 49 Mt. Carmel Road Asheville, NC 28806 (828) 250-6777

Forsyth County

Environmental Affairs Department 537 N. Spruce Street Winston-Salem, NC 27101 (336) 703-2440

Mecklenburg County

Land Use and Environmental Services Agency Mecklenburg Air Quality 700 N. Tryon Street Charlotte, NC 28202 (704) 336-5430

5.0 ADDITIONAL INFORMATION

Additional information may be found on N.C. asbestos rules, regulations, procedures and N.C. accredited inspectors, as well as associated forms for demolition notifications and asbestos permit applications at the N.C. Asbestos Hazard Management Program website:

https://epi.dph.ncdhhs.gov/asbestos/ahmp.html

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Project R-2233BB Rutherford County

6.0 BASIS OF PAYMENT

Payment for the work required in this provision will be at the lump sum contract unit price for "Asbestos Assessment". Such payment will be full compensation for all asbestos inspections, reports, permitting and notifications.

PROJECT SPECIAL PROVISION

(10-18-95) (Rev. 3-21-17)

PERMITS

Z-1a

The Contractor's attention is directed to the following permits, which have been issued to the Department of Transportation by the authority granting the permit.

PERMIT
Dredge and Fill and/or
Work in Navigable Waters (404)

Water Quality (401)

L. S. Army Corps of Engineers

Division of Environmental Management, DEQ

State of North Carolina

The Contractor shall comply with all applicable permit conditions during construction of this project. Those conditions marked by * are the responsibility of the Department and the Contractor has no responsibility in accomplishing those conditions.

Agents of the permitting authority will periodically inspect the project for adherence to the permits.

The Contractor's attention is also directed to Articles 107-10 and 107-13 of the 2018 Standard Specifications and the following:

Should the Contractor propose to utilize construction methods (such as temporary structures or fill in waters and/or wetlands for haul roads, work platforms, cofferdams, etc.) not specifically identified in the permit (individual, general, or nationwide) authorizing the project it shall be the Contractor's responsibility to coordinate with the Engineer to determine what, if any, additional permit action is required. The Contractor shall also be responsible for initiating the request for the authorization of such construction method by the permitting agency. The request shall be submitted through the Engineer. The Contractor shall not utilize the construction method until it is approved by the permitting agency. The request normally takes approximately 60 days to process; however, no extensions of time or additional compensation will be granted for delays resulting from the Contractor's request for approval of construction methods not specifically identified in the permit.

Where construction moratoriums are contained in a permit condition which restricts the Contractor's activities to certain times of the year, those moratoriums will apply only to the portions of the work taking place in the restricted waters, wetlands or buffer zones, provided that activities outside those areas is done in such a manner as to not affect the restricted waters, wetlands or buffer zones.



DEPARTMENT OF THE ARMY WILMINGTON DISTRICT, CORPS OF ENGINEERS 69 DARLINGTON AVENUE WILMINGTON, NORTH CAROLINA 28403-1343

December 4, 2020

Regulatory Division

Action ID SAW-2008-02857, STIP R-2233 B

North Carolina Department of Transportation Division of Highways Attn: Mr. Philip S. Harris III, P.E., C.P.M. Natural Environment Section Head 1598 Mail Service Center Raleigh, NC 27699-1598

Dear Mr. Harris:

In accordance with your written request of March 13, 2020, additional information submitted after the original request, and the ensuing administrative record, enclosed are two copies of a Department of the Army permit to discharge fill material into streams and wetlands to construct STIP R-2233 B. Construction of STIP R-2233 B will permanently impact 10,149 linear feet (If) of streams and 0.66 acre of wetlands, and temporarily impact 1,980 If of streams, along the 8.5-mile project corridor in Rutherford County, North Carolina.

Any deviation in the authorized work will likely require modification of this permit. If a change in the authorized work is necessary, you should promptly submit revised plans to the Corps showing the proposed changes. You may not undertake the proposed changes until the Corps notifies you that your permit has been modified.

Carefully read your permit. The general and special conditions are important. Your failure to comply with these conditions could result in a violation of Federal law. Certain significant general conditions require that:

- a. You must complete construction before December 31, 2030.
- b. You must notify this office in advance as to when you intend to commence and complete work.

c. You must allow representatives from this office to make periodic visits to your worksite as deemed necessary to assure compliance with permit plans and conditions.

You should address all questions regarding this authorization to Ms. Lori Beckwith in the Asheville Regulatory Field Office at loretta.a.beckwith@usace.army.mil or by phone at (828) 271-7980, ext. 4223.

Thank you in advance for completing our Customer Survey Form. This can be accomplished by visiting our web-site at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0 and completing the survey online. We value your comments and appreciate your taking the time to complete a survey each time you interact with our office.

Sincerely,

Monte Date: 2020.12.04 Matthews 10:00:53 -05'00'

FOR/ Scott McLendon Chief
Regulatory Division

Wilmington District.

Enclosures

Copies Furnished electronically (with special conditions):

Ms. Janet Mizzi U.S. Fish and Wildlife Service Asheville Ecological Service Field Office 160 Zillicoa Street Asheville, North Carolina 28801-1082

Mr. Todd Bowers
Oceans, Wetlands and Streams Protection Branch
Wetlands and Streams Regulatory Section
U.S. Environmental Protection Agency – Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303-8931

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DEPARTMENT OF THE ARMY PERMIT

Permittee NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

ATTN: MR. PHILIP S. HARRIS III, P.E., C.P.M.

Permit No. **SAW-2008-02857, STIP R-2233 B**

Issuing Office CESAW-RG-A

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: The project (STIP R-2233 B) involves the permanent discharge of fill material into 10,149 linear feet (If) of streams and 0.66 acre of wetlands, and the temporary discharge of fill material into 1,980 lf of streams, along the 8.5-mile project corridor.

Project Location: STIP R-2233 B will extend along existing US 221 from north of 74 Bypass to north of US 74 Business (Section BA) and on new location from north of US 74 Business to US 221 just north of SR 1366, (Section BB) in Rutherford County, North Carolina. Center coordinates for the project are N 35.37867, W 81.94998.

THIS IS A PHASED PERMIT AUTHORIZATION: This permit only authorizes work on Section R-2233 BB (Phase 1 for permitting) of the STIP R-2233 B project. The permittee is authorized to impact regulated waters along the R-2233 BB Section as follows: permanent discharge of fill material into 4,736 lf of streams and 0.11 acre of wetlands. The permittee is also authorized to temporarily impact 382 lf of streams during construction. Construction on the remaining section of STIP R-2233 B (i.e., R-2233 BA/Phase 2) shall not commence until final design has been completed for that section; the permittee has minimized impacts to waters and wetlands to the maximum extent practicable, and; any modifications to the plans, and the compensatory mitigation plans, have been approved by the US Army Corps of Engineers (the Corps).

Permit Conditions:

General Conditions:

- 1. The time limit for completing the work authorized ends on <u>December 31, 2030</u>. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
- 2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
- 3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination

required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

- 4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
- 5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.
- 6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit,

Special Conditions:

SEE ATTACHED SPECIAL CONDITIONS

Further Information:

- 1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:
 - () Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).
 - (X) Section 404 of the Clean Water Act (33 U.S.C. 1344).
 - () Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).
- 2. Limits of this authorization.
 - a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.
 - b. This permit does not grant any property rights or exclusive privileges.
 - c. This permit does not authorize any injury to the property or rights of others.
 - d. This permit does not authorize interference with any existing or proposed Federal project.
- 3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:
- a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
- b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
- c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
 - d. Design or construction deficiencies associated with the permitted work.
 - e. Damage claims associated with any future modification, suspension, or revocation of this permit.
- 4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

ENG FORM 1721, Nov 86

EDITION OF SEP 82 IS OBSOLETE.

(33 CFR 325 (Appendix A))

- 5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:
 - a. You fail to comply with the terms and conditions of this permit.
 - b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).
 - c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit, Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Carla Dagnino	December 3, 2020
(PERMITTEE) NC DEPARTMENT OF TRANSPORTATION ATTN: MR. PHILIP S. HARRIS III	(DATE)
This permit becomes effective when the Federal official, designated to a	ct for the Secretary of the Army, has signed below.
Monte	ate: 2020.12.04
Monte Matthews 10	0:04:31 -05'00'
FOR (DISTRICT COMMANDER) BENJAMIN A. BENNETT, COLO	ONEL (DATE)
When the structures or work authorized by this permit are still in existent conditions of this permit will continue to be binding on the new owner(s and the associated liabilities associated with compliance with its terms at) of the property. To validate the transfer of this permit
(TRANSFEREE)	(DATE)

SPECIAL CONDITIONS ACTION ID. SAW-2008-02857 NC DEPARTMENT OF TRANSPORTATION RUTHERFORDTON BYPASS, RUTHERFORD COUNTY STIP No. R-2233 B

Failure to institute and carry out the details of the following special conditions will result in a directive to cease all ongoing and permitted work within waters of the U.S. associated with the permitted project, or such other remedies and/or fine as the Wilmington District Engineer, or his authorized representatives, may seek.

WORK LIMITS/NOTIFCATION

- 1) The entire 8.5-mile long project is identified as STIP R-2233 B. This permit only authorizes work on Section R-2233 BB of this project; this section is also known as "Phase 1" for permitting purposes. Construction on the remaining section (i.e., Section R-2233 BA "Phase 2") of the STIP R-2233 B project shall not commence until: (a) final design for those sections/phases has been completed and submitted to the U.S. Army Corps of Engineers (Corps); (b) the Permittee has minimized impacts to waters and wetlands to the maximum extent practicable for that section/phase and the Corps concurs with this assessment through standard Merger 4B and 4C meetings; (c) any modification(s) to the plans for that section/phase have been approved by the Corps in writing; and (d) a final compensatory mitigation plan for that section/phase has been submitted by the Permittee and approved by the Corps.
- 2) Work Limits: All work authorized by this permit shall be performed in strict compliance with the permit plans titled, "Wetland and Surface Water Impacts Permit, R-2233BB", permit drawing sheets 1-37, dated March 13, 2020, which are now part of this permit. The Permittee shall ensure that the construction design plans for this project do not deviate from the approved permit plans. Any modification to the approved permit plans must be approved by the US Army Corps of Engineers prior to any active construction in waters or wetlands.
- 3) Unauthorized Dredge or Fill: Except as authorized by this permit or any U.S. Army Corps of Engineers approved modification to this permit, no excavation, fill, or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands, or shall any activities take place that cause the degradation of waters or wetlands. There shall be no excavation from, waste disposal into, or degradation of, jurisdictional wetlands or waters associated with this permit without appropriate modification of

this permit, including appropriate compensatory mitigation. This prohibition applies to all borrow and waste activities connected with this project.

- 4) Maintain Flows and Circulation Patterns of Waters: Except as specified in the approved permit plans referenced above, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within waters or wetlands or to reduce the reach of waters and/or wetlands.
- 5) Permit Distribution: The Permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit. A copy of this permit, including all conditions, drawings and attachments shall be available at the project site during the construction and maintenance of this project.
- 6) Pre-Construction Meeting: The Permittee shall schedule and attend a preconstruction meeting between its representatives, the contractors representatives, and the U.S. Army Corps of Engineers, Asheville Regulatory Field Office, NCDOT Regulatory Project Manager, prior to any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all the terms and conditions contained with this Department of Army Permit. The Permittee shall provide the Corps, Asheville Regulatory Field Office, NCDOT Project Manager, with a copy of the final permit plans at least two weeks prior to the preconstruction meeting along with a description of any changes that have been made to the project's design, construction methodology or construction timeframe. The Permittee shall schedule the preconstruction meeting for a time frame when the Corps and NCDWR Project Managers can attend. The Permittee shall invite the Corps and NCDWR Project Managers a minimum of thirty (30) days in advance of the scheduled meeting in order to provide those individuals with ample opportunity to schedule and participate in the required meeting. The thirty (30) day requirement can be waived with the concurrence of the Corps.
- 7) Notification of Construction Commencement and Completion: The Permittee shall notify the U.S. Army Corps of Engineers in writing prior to beginning the work authorized by this permit and again upon completion of the work authorized by this permit.
- 8) Reporting Address: All reports, documentation, and correspondence required by the conditions of this permit shall be submitted to the following: U.S. Army Corps of Engineers, Wilmington District Asheville Regulatory Field Office, Attn:

Lori Beckwith, 151 Patton Ave., Room 208, Asheville, NC 28801-5006, or loretta.a.beckwith@usace.army.mil . The Permittee shall reference the following permit number, SAW-2008-02857, on all submittals.

- 9) Reporting Violations: Violation of these permit conditions or violation of Section 404 of the Clean Water Act shall be reported to the Corps by email to loretta.a.beckwith@usace.army.mil and by telephone at: 828-271-7980, ext. 4223, within 24 hours of the Permittee's discovery of the violation.
- 10) Permit Revocation: The Permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the work will, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the water or wetland to its pre-project condition.

RELATED LAWS

- 11) Clean Fill: The Permittee shall use only clean fill material for this project. The fill material shall be free from items such as trash, construction debris, metal and plastic products, and concrete block with exposed reinforcement bars. Soils used for fill shall not be contaminated with any toxic substance in concentrations governed by Section 307 of the Clean Water Act. Unless otherwise authorized by this permit, all fill material placed in waters or wetlands shall be generated from an upland source.
- 12) Water Contamination: All mechanized equipment shall be regularly inspected and maintained to prevent contamination of waters and wetlands from fuels, lubricants, hydraulic fluids, or other toxic materials. In the event of a spill of petroleum products or any other hazardous waste, the Permittee shall immediately report it to the N.C. Division of Water Resources at (919) 733-3300 or (800) 858-0368 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act shall be followed.
- 13) Federally Listed Species/Biological Opinion: The U.S. Fish and Wildlife Service issued a Biological Opinion (BO) titled, "Amended Biological Opinion, Proposed US 221 Widening and Bypass, Rutherfordton, Rutherford County, NC; STIP R-2233B", dated August 21, 2020, which contains conservation measures for the project's effect on the federally threatened dwarf-flowered heartleaf (DFHL) (*Hexastylis naniflora*). Your authorization under this permit is conditional upon your compliance with the conservation measures in the aforementioned BO, which are incorporated by reference in this permit. Failure to comply with the conservation measures would constitute non-compliance with your permit. The

- U.S. Fish and Wildlife Service is the appropriate authority to determine compliance with the conservation measures of its BO, and with the ESA.
- * 14) NCDOT shall abide by all stipulations identified in the Memorandum of Agreement titled, "MEMORANDUM OF AGREEMENT AMONG THE US ARMY CORPS OF ENGINEERS, THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, THE NORTH CAROLINA STATE HISTORIC PRESERVATION OFFICER AND THE OVERMOUNTAIN VICTORY NATIONAL HISTORIC TRAIL FOR US 221 BYPASS OF RUTHERFORDTON, RUTHERFORD COUNTY, NC, TIP PROJECT R-2233B", executed in 2013. This MOA is incorporated herein by reference.

AQUATIC LIFE/CULVERTS

- 15) Prohibitions on Concrete: The Permittee shall take measures necessary to prevent live or fresh concrete, including bags of uncured concrete, from coming into contact with any water in or entering into waters of the United States. Water inside coffer dams or casings that has been in contact with concrete shall only be returned to waters of the United States when it no longer poses a threat to aquatic organisms (concrete is set and cured).
- 16) Unless otherwise requested in the application and depicted on the approved permit plans, culverts greater than 48 inches in diameter shall be buried at least one foot below the bed of the stream. Culverts 48 inches in diameter and less shall be buried or placed on the stream bed as practicable and appropriate to maintain aquatic passage, and every effort shall be made to maintain existing channel slope. The bottom of the culvert shall be placed at a depth below the natural stream bottom to provide for passage during drought or low flow conditions. Culverts shall be designed and constructed in a manner that minimizes destabilization and head cutting.
- 17) Measures shall be included in the construction/installation of culverts that will promote the safe passage of fish and other aquatic organisms. The dimension, pattern, and profile of the stream above and below a pipe or culvert shall not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed opening shall be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. Spring flow should be determined from gauge data, if available. In the absence of such data, bankfull flow can be used as a comparable level.
- 18) Aquatic Life Movement: Unless otherwise requested in the application and depicted on the approved permit plans, no activity may substantially disrupt the

P-11

necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area. All discharges of dredged or fill material within waters of the United States shall be designed and constructed to maintain low flows to sustain the movement of aquatic species.

19) Culverts placed within wetlands must be installed in a manner that does not restrict the flows and circulation patterns of waters of the United States. Culverts placed across wetland fills purely for the purposes of equalizing surface water shall not be buried, but the culverts must be of adequate size and/or number to ensure unrestricted transmission of water.

SEDIMENT AND EROSION CONTROL

- 20) During the clearing phase of the project, heavy equipment shall not be operated in surface waters or stream channels. Temporary stream crossings will be used to access the opposite sides of stream channels. All temporary diversion channels and stream crossings will be constructed of non-erodible materials. Grubbing of riparian vegetation will not occur until immediately before construction begins on a given segment of stream channel.
- 21) No fill or excavation impacts for the purposes of sedimentation and erosion control shall occur within jurisdictional waters, including wetlands, unless the impacts are included on the approved plan drawings and specifically authorized by this permit. This includes, but is not limited to, sediment control fences and other barriers intended to catch sediment losses.
- 22) The Permittee shall remove all sediment and erosion control measures placed in waters and/or wetlands, and shall restore natural grades on those areas, prior to project completion.
- 23) The Permittee shall use appropriate sediment and erosion control practices which equal or exceed those outlined in the most recent version of the "North Carolina Sediment and Erosion Control Planning and Design Manual" to ensure compliance with the appropriate turbidity water quality standard. Erosion and sediment control practices shall be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to ensure compliance with the appropriate turbidity water quality standards. This shall include, but is not limited to, the immediate installation of silt fencing or similar appropriate devices around all areas subject to soil disturbance or the movement of earthen fill, and the immediate stabilization of all disturbed areas. Additionally, the project shall remain in full compliance with all aspects of the Sedimentation Pollution Control

Act of 1973 (North Carolina General Statutes Chapter 113A, Article 4). Adequate sedimentation and erosion control measures shall be implemented prior to any ground disturbing activities to minimize impacts to downstream aquatic resources. These measures shall be inspected and maintained regularly, especially following rainfall events. All fill material shall be adequately stabilized at the earliest practicable date to prevent sediment from entering into adjacent waters or wetlands.

- 24) The Permittee shall implement all reasonable and practicable measures to ensure that equipment, structures, fill pads, work, and operations associated with this project do not adversely affect upstream and/or downstream reaches. Adverse effects include, but are not limited to, channel instability, flooding, and/or stream bank erosion. The Permittee shall routinely monitor for these effects, cease all work when detected, take initial corrective measures to correct actively eroding areas, and notify this office immediately. Permanent corrective measures may require additional authorization by the U.S. Army Corps of Engineers.
- 25) Temporary Fills: Within thirty (30) days of the date of completing the authorized work, the Permittee shall remove all temporary fills in waters of the United States and restore the affected areas to pre-construction contours and elevations. The affected areas shall be re-vegetated with native, non-invasive vegetation as necessary to minimize erosion and ensure site stability.

BORROW AND WASTE

- 26) To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent waters and wetlands, except as authorized by this permit, the Permittee shall require its contractors and/or agents to identify all areas to be used as a borrow and/or waste site(s) associated with this project and provide this information to the U.S. Army Corps of Engineers, along with the following:
 - a) Borrow Sites: When any portion of an aquatic resource(s) (i.e., a stream, river, wetland, pond, seep, and/or spring) is located within the boundaries of the proposed borrow site(s), or within a distance of 400 feet from the nearest boundary of the proposed borrow site(s), the Permittee shall provide the U.S. Army Corps of Engineers with appropriate maps indicating: the locations of the proposed borrow site(s); boundaries of the proposed borrow site(s), and; delineation(s) of all aquatic resources (as described above) within the site, and out to 400 feet from the boundary of the site, as soon as such information is available.

b) Waste Sites: When any portion of an aquatic resource(s) (i.e., a stream, river, wetland, pond, seep, and/or spring) is located within the boundaries of the proposed waste site(s), the Permittee shall provide the U.S. Army Corps of Engineers with appropriate maps indicating: the locations of the proposed waste site(s); boundaries of the proposed waste site(s), and; delineation(s) of all aquatic resources (as described above) within the site, as soon as such information is available.

For those areas proposed as waste sites that have any aquatic resources within the boundaries, or borrow sites that have any aquatic resources within the boundary or out to 400 feet beyond the boundaries, the Permittee shall not approve those borrow and/or waste sites until the U.S. Army Corps of Engineers issues written confirmation that an area does or does not contain potentially jurisdictional resources. All delineations of aquatic sites on borrow and/or waste sites shall be verified by the U.S. Army Corps of Engineers and shown on the approved reclamation plans. The Permittee shall ensure that all borrow and/or waste sites comply with Special Condition #4 of this permit. Additionally, the Permittee shall produce and maintain documentation of all borrow and waste sites associated with this project. When aquatic resources are located within these designated areas, this documentation will include data regarding soils, vegetation, hydrology, delineation(s) of aquatic sites, and any jurisdictional determinations made by the Corps to clearly demonstrate compliance with Special Condition #4. All information will be available to the U.S. Army Corps of Engineers upon request. The Permittee shall require its contractors to complete and execute reclamation plans for each borrow and/or waste site and provide written documentation that the reclamation plans have been implemented and all work is completed to the Permittee. For areas with aquatic resources that the Corps has determined are potentially jurisdictional (or jurisdictional), this documentation will be provided to the U.S. Army Corps of Engineers within 30 days of the completion of the reclamation work. The permittee shall ensure that (1) waste material placed in a project-related waste site(s) does not migrate into an aquatic resource, even if that resource is located outside the boundaries of the waste site, and (2) that any project-related activities in borrow sites does not adversely impact any off-site waters, to include dewatering (due to project-related excavation/borrow activities in the borrow site) of those off-site waters.

COMPENSATORY MITIGATION

* 27) In order to compensate for impacts associated with this permit, mitigation shall be provided in accordance with the provisions outlined on the most recent version of the attached Compensatory Mitigation Responsibility Transfer Form. The requirements of this form, including any special conditions listed on this form, are hereby incorporated as special conditions of this permit.

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ROY COOPER Governor ELIZABETH S. BISER Secretary S. DANIEL SMITH Director



August 19, 2021

Mr. Philip S. Harris, III, P.E., CPM Natural Environment Section Head Project Development and Environmental Analysis North Carolina Department of Transportation 1598 Mail Service Center Raleigh, North Carolina, 27699-1598

Subject: Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water with ADDITIONAL CONDITIONS for proposed improvements to the Rutherfordton Bypass, US 221 South of US 74 Business to North of SR 1366 (Roper Loop Road) in Rutherford County, Federal Aid Project No. STBG-0024(083), TIP Nos. R-2233BB & BA.

NCDWR Project No. 20200362 v. 2

Dear Mr. Harris:

Attached hereto is a modification of Certification No. WQC004229 issued to The North Carolina Department of Transportation (NCDOT) dated June 10, 2020.

If we can be of further assistance, do not hesitate to contact us.

Sincerely,

Omy Chapman
S. = 9C9886312DCD474...

DocuSigned by:

Division of Water Resources

Attachments

Electronic copy only distribution:

Lori Beckwith, US Army Corps of Engineers, Asheville Field Office Roger Bryan, Division 13 Environmental Officer Colin Mellor, NC Department of Transportation Carla Dagnino, NC Department of Transportation Amanetta Somerville, US Environmental Protection Agency Holland Youngman, US Fish and Wildlife Service Marla Chambers, NC Wildlife Resources Commission Beth Harmon, Division of Mitigation Services File Copy



Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Resources (NCDWR) Regulations in 15 NCAC 2H .0500. This certification authorizes the NCDOT to impact an additional 0.01 acres of jurisdictional wetlands and 879 linear feet of jurisdictional streams in Rutherford County. The project shall be constructed pursuant to the modification dated received July 27, 2021. The authorized impacts are as described below:

Stream Impacts in the Broad River Basin

Site	Permanent Fill in Intermittent Stream (linear ft)	Temporary Fill in Intermittent Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)	Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear feet)	Stream Impacts Requiring Mitigation (linear ft)
Original approved impacts	204	43	4,532	339	5,118	3,714
New additional impacts with this approval at Site 19			879		879	879
TOTAL:	204	43	5,411	339	5,997	4,593

Total Stream Impact for R-2233BB: 5,615 linear feet

Wetland Impacts in the Broad River Basin (Riverine)

Site	Fill (ac)	Fill (temporary) (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Total Wetland Impact (ac)	Impacts Requiring Mitigation
Original approved impacts	0.11					0.11	0.11
New additional impacts with this approval at Site 20	0.01					0.01	0.01
Total	0.12	0.00	0.00	0.00	0.00	0.12	0.12

Total Wetland Impact for R-2233BB: 0.12 acres.

The application provides adequate assurance that the discharge of fill material into the waters of the Broad River Basin in conjunction with the proposed development will not result in a violation of applicable Water Quality Standards and discharge guidelines. Therefore, the State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of PL 92-500 and PL 95-217 if conducted in accordance with the application and conditions hereinafter set forth.

This approval is only valid for the purpose and design that you submitted in your modified application dated received July 27, 2021. All the authorized activities and conditions of certification associated with the original Water Quality Certification dated June 10, 2020, still apply except where superseded by this certification. Should your project change, you are required to notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one tenth of an acre or 300 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Conditions of Certification:

1. This modification is applicable only to the additional proposed activities. All of the authorized activities and conditions of certification associated with the original Water Quality Certification dated June 10, 2021, still apply except where superseded by this certification.

Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. This Certification shall become null and void unless the above conditions are made conditions of the Federal 404 and/or Coastal Area Management Act Permit. This Certification shall expire upon the expiration of the 404 or CAMA permit.

If you wish to contest any statement in the attached Certification you must file a petition for an administrative hearing. You may obtain the petition form from the office of Administrative hearings. You must file the petition with the office of Administrative Hearings within sixty (60) days of receipt of this notice. A petition is considered filed when it is received in the office of Administrative Hearings during normal office hours. The Office of Administrative Hearings accepts filings Monday through Friday between the hours of 8:00am and 5:00pm, except for official state holidays. The original and one (1) copy of the petition must be filed with the Office of Administrative Hearings.

The petition may be faxed-provided the original and one copy of the document is received by the Office of Administrative Hearings within five (5) business days following the faxed transmission.

The mailing address for the Office of Administrative Hearings is:

Office of Administrative Hearings 6714 Mail Service Center Raleigh, NC 27699-6714

Telephone: (919) 431-3000, Facsimile: (919) 431-3100

A copy of the petition must also be served on DEQ as follows:

Mr. Bill F. Lane, General Counsel Department of Environmental Quality 1601 Mail Service Center

This the 19th day of August 2021

DIVISION OF WATER RESOURCES

DocuSigned by:

Docusigned by:

Omy Chapman

9C9886312DCD474... S. Daniel Smith, Director

WQC No. 004229

DocuSign Envelope ID: 66DAA3D4-701B-4A13-B00D-11FC90C433E1



ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
S. DANIEL SMITH
Director

June 10, 2020

Mr. Philip S. Harris, III, P.E., CPM Natural Environment Section Head Project Development and Environmental Analysis North Carolina Department of Transportation 1598 Mail Service Center Raleigh, North Carolina, 27699-1598

Subject: 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with

ADDITIONAL CONDITIONS for the proposed Rutherfordton Bypass, US 221 North of US 74 Bypass to North of SR 1366 (Roper Loop Road) in Rutherford County, Federal Aid Project No. STBG-0024(083),

TIP Nos. R-2233BB & R-2233BA. NCDWR Project No. 20200362

Dear Mr. Harris:

Attached hereto is a copy of Certification No. WQC004229 issued to The North Carolina Department of Transportation (NCDOT) dated June 10, 2020.

If we can be of further assistance, do not hesitate to contact us.

Sincerely,

Docusigned by:

Omy Chapman

Softman Smith, Director

Division of Water Resources

Attachments

Electronic copy only distribution:

Lori Beckwith, US Army Corps of Engineers, Asheville Field Office Roger Bryan, Division 13 Environmental Officer Jeff Hemphill, NC Department of Transportation Colin Mellor, NC Department of Transportation Carla Dagnino, NC Department of Transportation Dr. Cynthia Van Der Wiele, US Environmental Protection Agency Claire Ellwanger, US Fish and Wildlife Service Marla Chambers, NC Wildlife Resources Commission Beth Harmon, Division of Mitigation Services File Copy



401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Resources (NCDWR) Regulations in 15 NCAC 2H .0500 and 15A NCAC 2B. This certification authorizes the NCDOT to impact 0.11 acres of jurisdictional wetlands and 4,736 linear feet of jurisdictional streams in Rutherford County. The project shall be constructed pursuant to the application dated received March 13, 2020. The authorized impacts are as described below:

Stream Impacts in the Broad River Basin

Site	Permanent Fill in Intermittent Stream (linear ft)	Temporary Fill in Intermittent Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)	Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear feet)	Stream Impacts Requiring Mitigation (linear ft)
1			43	34	77	0
1			24	14	38	0
4			139	18	157	139
4			698		698	698
4	68				68	
4			10	7	17	10
5			10	17	27	0
5			112		112	0
5	28	21			49	0
6			11	9	20	0
6			670		670	670
6			34	18	52	34
7			832		832	832
8			445		445	445
8			32		32	32
8			25	20	45	0
9			14	9	23	0
9			140		140	0
9			55	7	62	0
10			72	19	91	72
10			217		217	217
10			45	51	96	45
11			10	27	37	0
11			151		151	0
13			35	19	54	0
14			10	24	34	0
15			22	14	36	0
15			506		506	506
15			14	19	33	14
16	52	10			62	0
16	38				38	0
16	18	12			30	0
17			143		143	0
18			13	13	26	0
TOTAL:	204	43	4,532	339	5,118	3,714

Total Stream Impact for R-2233BB: 4,736 linear feet

Wetland Impacts in the Broad River Basin (Riverine)

Site	Fill (ac)	Fill (temporary) (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Total Wetland Impact (ac)	Impacts Requiring Mitigation (ac)
W8	0.11					0.11	0.00

Total Wetland Impact for R-2233BB: 0.11 acres.

The application provides adequate assurance that the discharge of fill material into the waters of the Broad River Basin in conjunction with the proposed development will not result in a violation of applicable Water Quality Standards and discharge guidelines. Therefore, the State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of PL 92-500 and PL 95-217 if conducted in accordance with the application and conditions hereinafter set forth.

This approval is only valid for the purpose and design that you submitted in your application dated received March 13, 2020. Should your project change, you are required to notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 300 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Condition(s) of Certification:

Project Specific Conditions

- 1. The NCDOT Division Environmental Officer or Environmental Assistant will conduct a preconstruction meeting with all appropriate staff to ensure that the project supervisor and essential staff understand the potential issues with stream and pipe alignment at the permitted site. NCDWR staff shall be invited to the pre-construction meeting. [15A NCAC 02H.0506(b)(2) and (b)(3)
- * 2. Compensatory mitigation for 3,714 linear feet of impact to streams is required. We understand that you have chosen to perform compensatory mitigation for impacts to streams through the North Carolina Division of Mitigation Service (DMS) (formerly NCEEP), and that the DMS has agreed to implement the mitigation for the project. The DMS has indicated in a letter dated March 4, 2020, that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the DMS Mitigation Banking Instrument signed July 28, 2010.
- * 3. When final design plans are completed for R-2233BA, a modification to the 401 Water Quality Certification shall be submitted with five copies and fees to the NC Division of Water Resources. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, and other surface waters, and buffers. No construction activities that impact any wetlands, streams, surface waters, or buffers located in R-2233BA shall begin until after the permittee applies for, and receives a written modification of the 401 Water Quality Certification from the NC Division of Water Resources.

General Conditions

1. Unless otherwise approved in this certification, placement of culverts and other structures in open waters and streams shall be placed below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and downstream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by NCDWR. If this condition is unable to be met due to

- bedrock or other limiting features encountered during construction, please contact NCDWR for guidance on how to proceed and to determine whether or not a permit modification will be required. [15A NCAC 02H.0506(b)(2)]
- 2. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills. [15A NCAC 02B.0200]
- 3. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers. [15A NCAC 02H.0506(b)(2)]
- 4. The dimension, pattern and profile of the stream above and below the crossing shall not be modified. Disturbed floodplains and streams shall be restored to natural geomorphic conditions. [15A NCAC 02H.0506(b)(2)]
- 5. The use of rip-rap above the Normal High Water Mark shall be minimized. Any rip-rap placed for stream stabilization shall be placed in stream channels in such a manner that it does not impede aquatic life passage. [15A NCAC 02H.0506(b)(2)]
- * 6. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]
 - 7. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water. [15A NCAC 02H.0506(b)(3) and (c)(3)]
 - 8. Heavy equipment shall be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the introduction of other pollutants into the stream. [15A NCAC 02H.0506(b)(3)]
 - 9. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials. [15A NCAC 02H.0506(b)(3)]
 - 10. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification. [15A NCAC 02H.0506(b)(3)]
 - 11. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited. [15A NCAC 02H.0506(b)(3)]
 - 12. When applicable, all construction activities shall be performed and maintained in full compliance with G.S. Chapter 113A Article 4 (Sediment and Pollution Control Act of 1973). Regardless of applicability of the Sediment and Pollution Control Act, all projects shall incorporate appropriate Best Management Practices for the control of sediment and erosion so that no violations of state water quality standards, statutes, or rules occur. [15A NCAC 02H .0506{b)(3) and (c)(3) and 15A NCAC 02B .0200]
 - 13. Design, installation, operation, and maintenance of all sediment and erosion control measures shall be equal to or exceed the requirements specified in the most recent version of the North Carolina Sediment and Erosion Control Manual, or for linear transportation projects, the NCDOT Sediment and Erosion Control Manual.
 - 14. All devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) sites, including contractor-owned or leased borrow pits associated with the project. Sufficient materials required for stabilization and/or repair of erosion control measures and stormwater routing and treatment shall be on site at all times.

- 15. For borrow pit sites, the erosion and sediment control measures shall be designed, installed, operated, and maintained in accordance with the most recent version of the North Carolina Surface Mining Manual. Reclamation measures and implementation shall comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act and the Mining Act of 1971.
- 16. If the project occurs in waters or watersheds classified as Primary Nursery Areas (PNAs), SA, WS-1, WS-11, High Quality Waters (HQW), or Outstanding Resource Waters (ORW), then the sedimentation and erosion control designs shall comply with the requirements set forth in 15A NCAC 04B .0124, Design Standards in Sensitive Watershed. [15A NCAC 02H.0506(b)(3) and (c)(3); GC 4135]
- 17. The permittee and its authorized agents shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State and Federal law. If the NCDWR determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, the NCDWR may reevaluate and modify this certification. [15A NCAC 02B.0200]
- 18. All fill slopes located in jurisdictional wetlands shall be placed at slopes no flatter than 3:1, unless otherwise authorized by this certification. [15A NCAC 02H.0506(b)(2)]
- 19. A copy of this Water Quality Certification shall be maintained on the construction site at all times. In addition, the Water Quality Certification and all subsequent modifications, if any, shall be maintained with the Division Engineer and the on-site project manager. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]
- 20. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification. [15A NCAC 02H.0501 and .0502]
- 21. The issuance of this certification does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (i.e. local, state, and federal) having jurisdiction, including but not limited to applicable buffer rules, stormwater management rules, soil erosion and sedimentation control requirements, etc.
- 22. The Permittee shall report any violations of this certification to the Division of Water Resources within 24 hours of discovery. [15A NCAC 02B.0506(b)(2)]
- * 23. Upon completion of the project (including any impacts at associated borrow or waste sites), the NCDOT Division Engineer shall complete and return the enclosed "Certification of Completion Form" to notify the NCDWR when all work included in the 401 Certification has been completed. [15A NCAC 02H.0502(f)]
 - 24. Native riparian vegetation must be reestablished in the riparian areas within the construction limits of the project by the end of the growing season following completion of construction. [15A NCAC 02B. 0506(b)(2)]
 - 25. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated with this permit without appropriate modification. Should waste or borrow sites, or access roads to waste or borrow sites, be located in wetlands or streams, compensatory mitigation will be required since that is a direct impact from road construction activities. [15A NCAC 02H.0506(b)(3) and (c)(3)]
 - 26. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards [15A NCAC 02H.0506(b)(3) and (c)(3]):
 - a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.

- b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
- c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
- d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.
- 27. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification. [15A NCAC 02H.0506(b)(3) and (c)(3)]

Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. This Certification shall become null and void unless the above conditions are made conditions of the Federal 404 and/or Coastal Area Management Act Permit. This Certification shall expire upon the expiration of the 404 or CAMA permit.

If you wish to contest any statement in the attached Certification you must file a petition for an administrative hearing. You may obtain the petition form from the office of Administrative hearings. You must file the petition with the office of Administrative Hearings within sixty (60) days of receipt of this notice. A petition is considered filed when it is received in the office of Administrative Hearings during normal office hours. The Office of Administrative Hearings accepts filings Monday through Friday between the hours of 8:00am and 5:00pm, except for official state holidays. The original and one (1) copy of the petition must be filed with the Office of Administrative Hearings.

The petition may be faxed-provided the original and one copy of the document is received by the Office of Administrative Hearings within five (5) business days following the faxed transmission. The mailing address for the Office of Administrative Hearings is:

Office of Administrative Hearings 6714 Mail Service Center Raleigh, NC 27699-6714

Telephone: (919)-431-3000, Facsimile: (919)-431-3100

A copy of the petition must also be served on DEQ as follows:

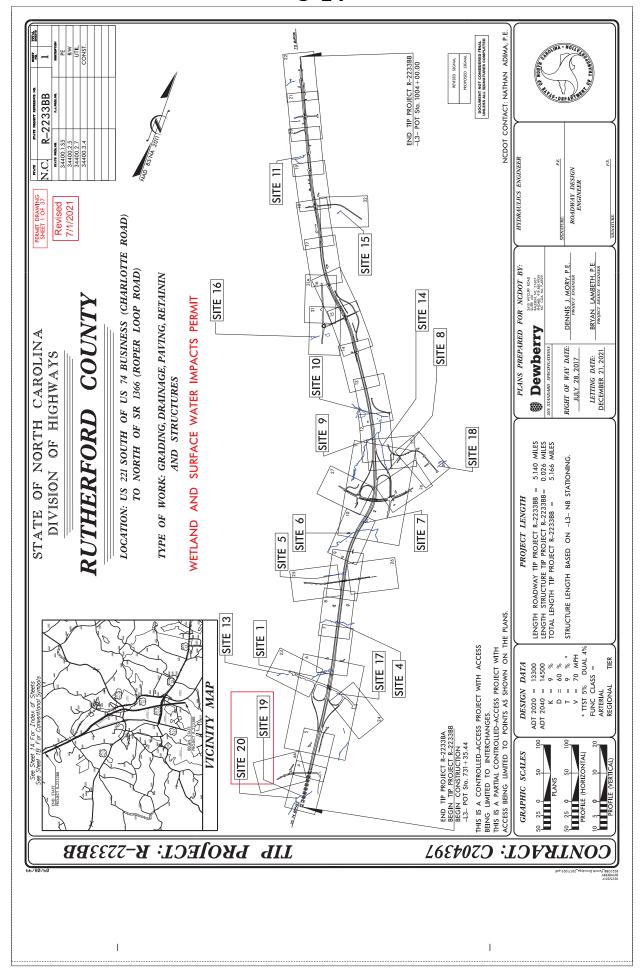
Mr. Bill F. Lane, General Counsel Department of Environmental Quality 1601 Mail Service Center

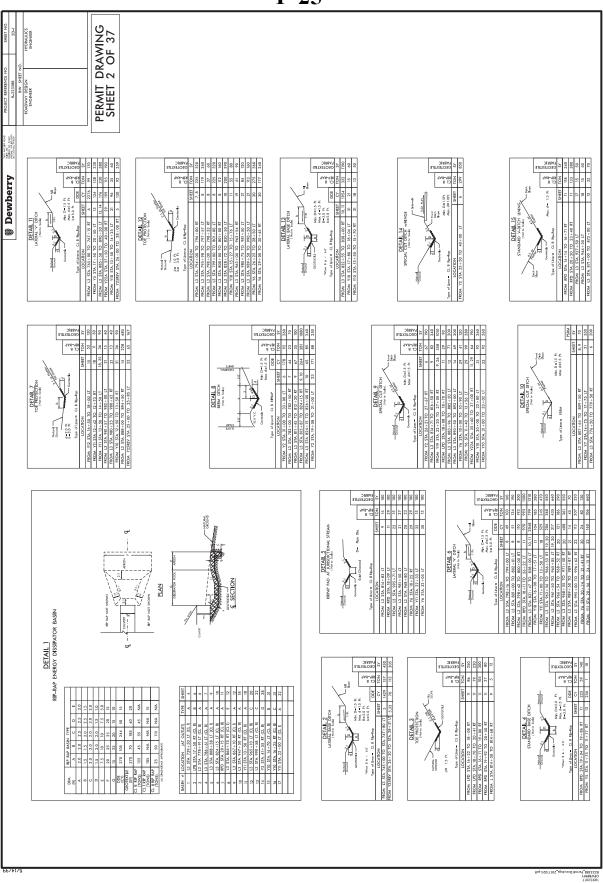
This the 10th day of June 2020

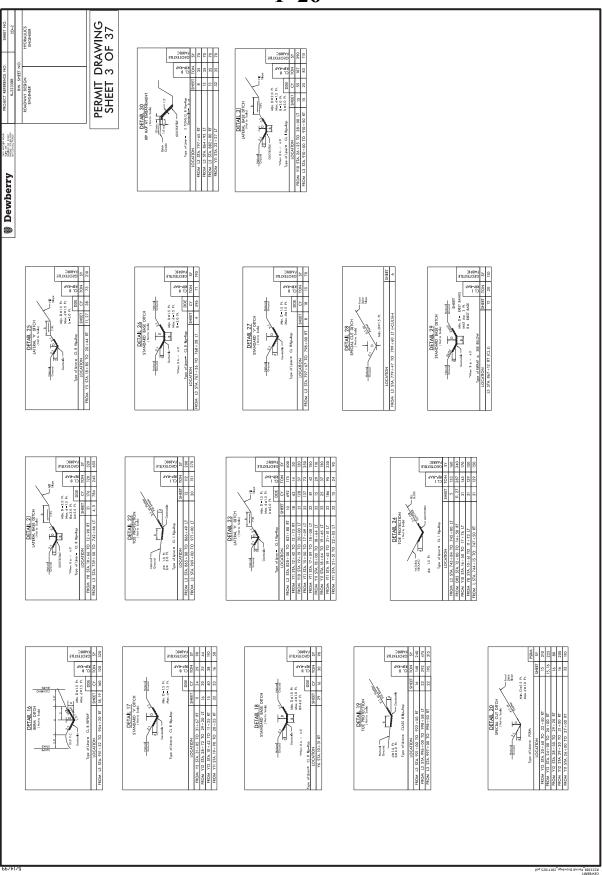
DIVISION OF WATER RESOURCES

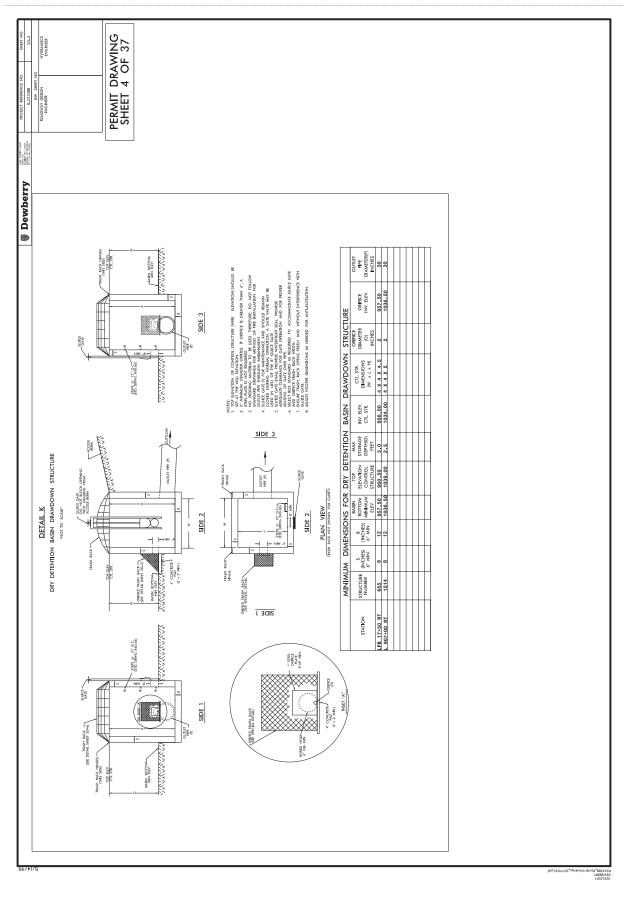
Docusigned by:
Omy Chapman
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S. Daniel Smith, Director

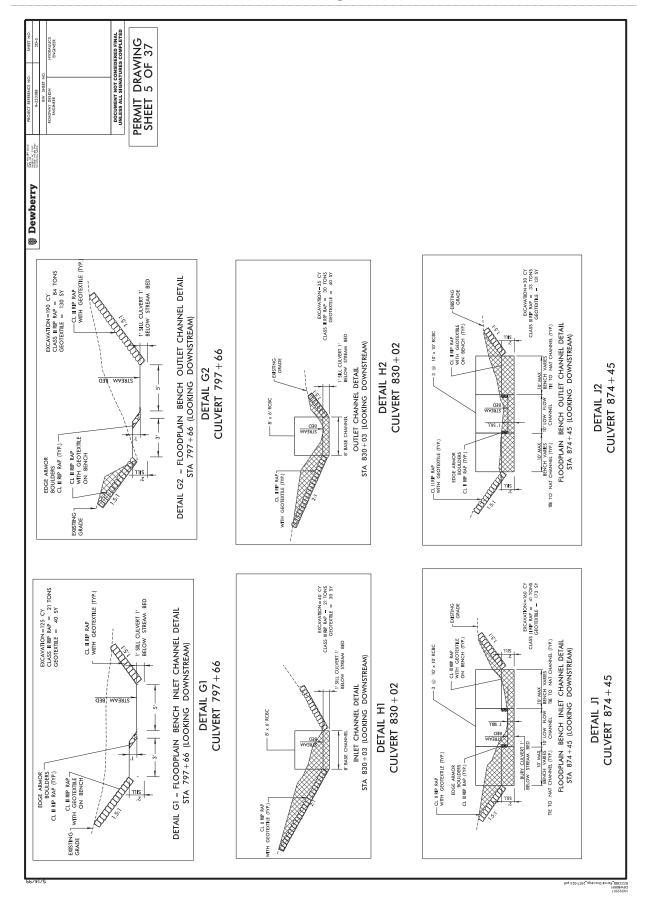


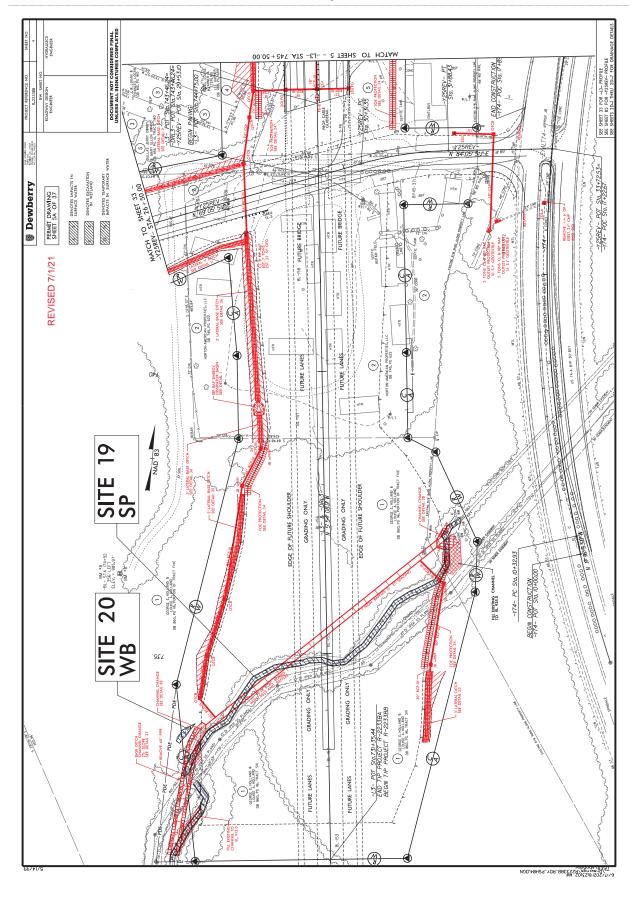


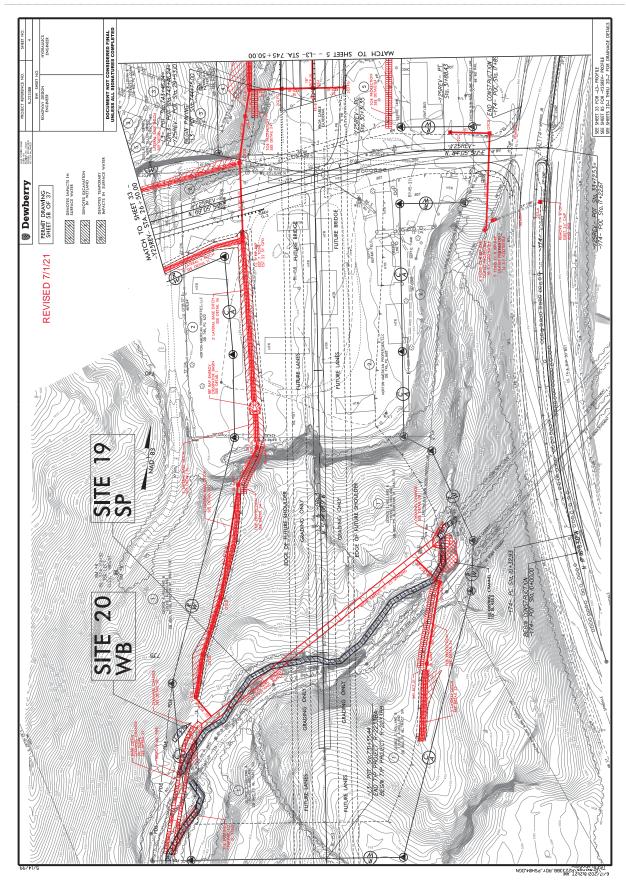


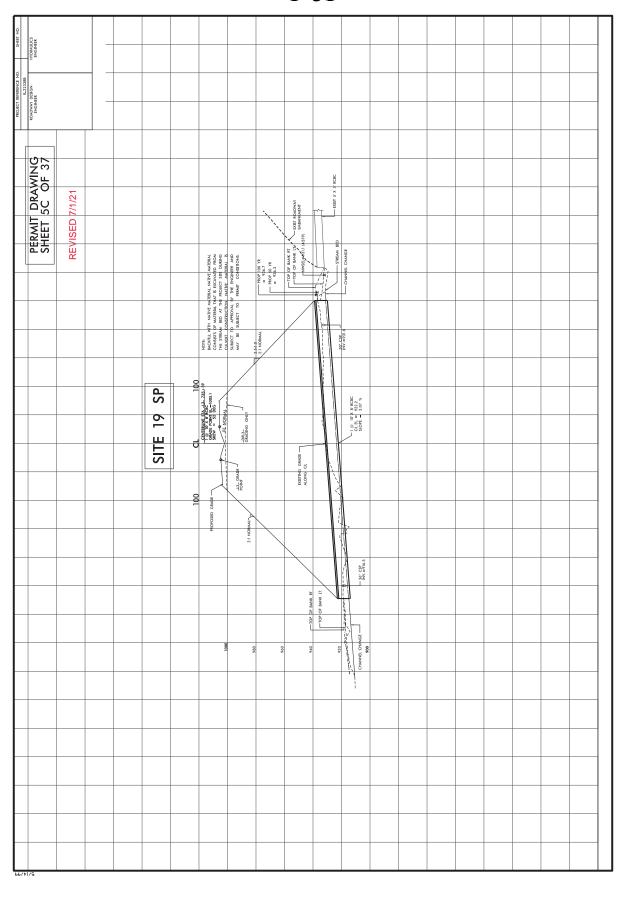


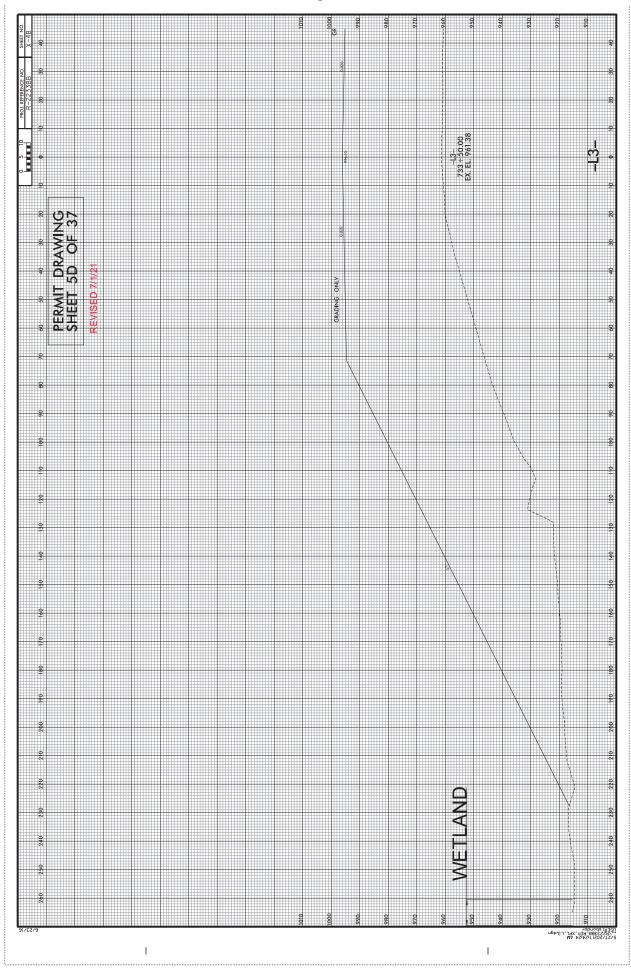
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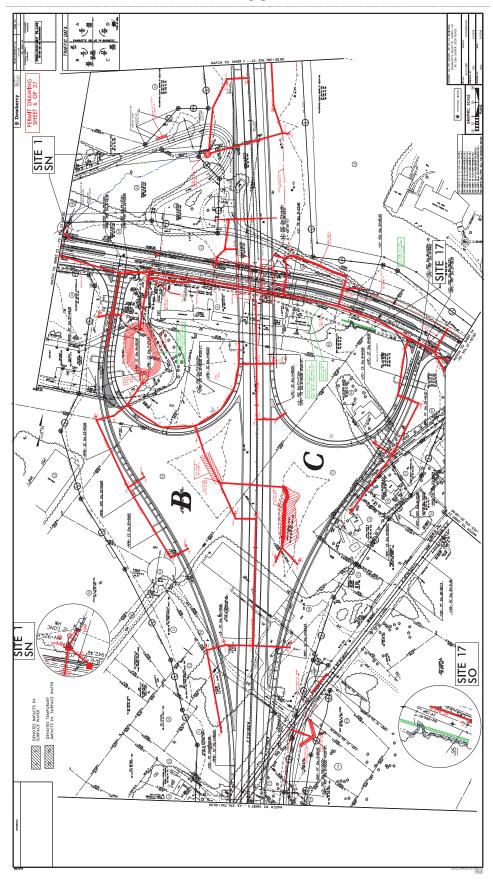


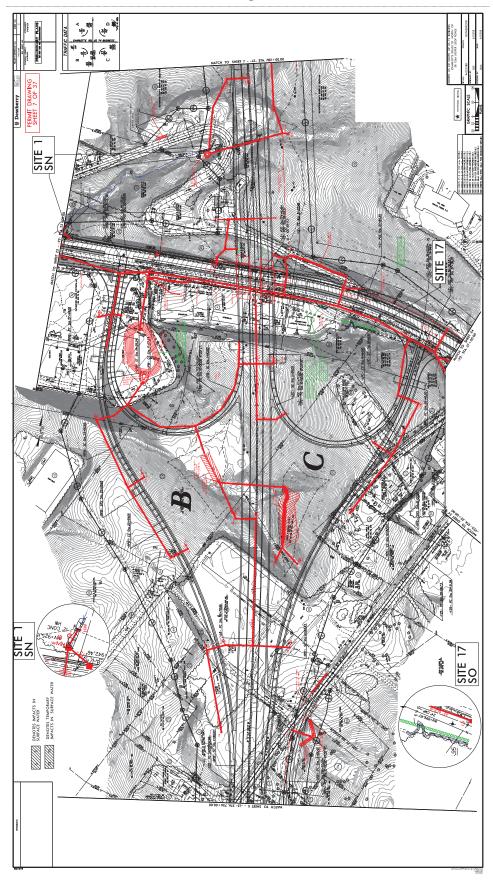


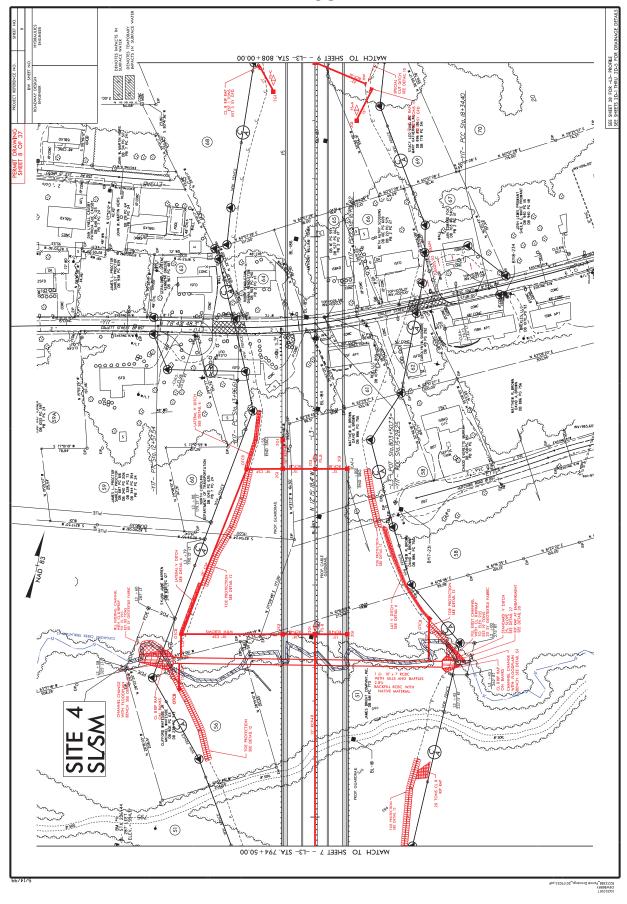


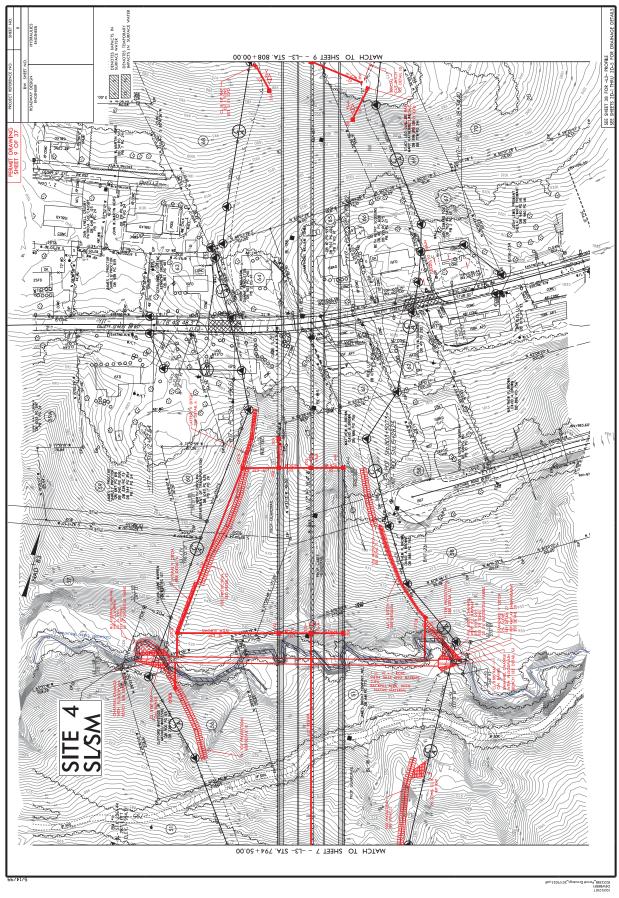


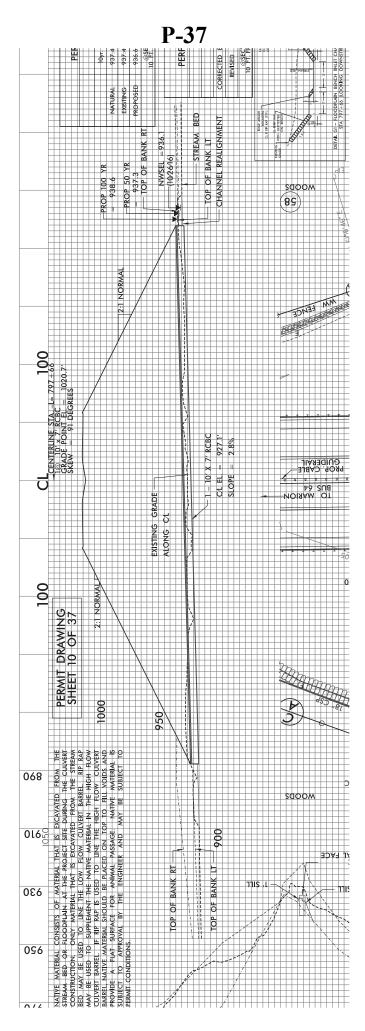


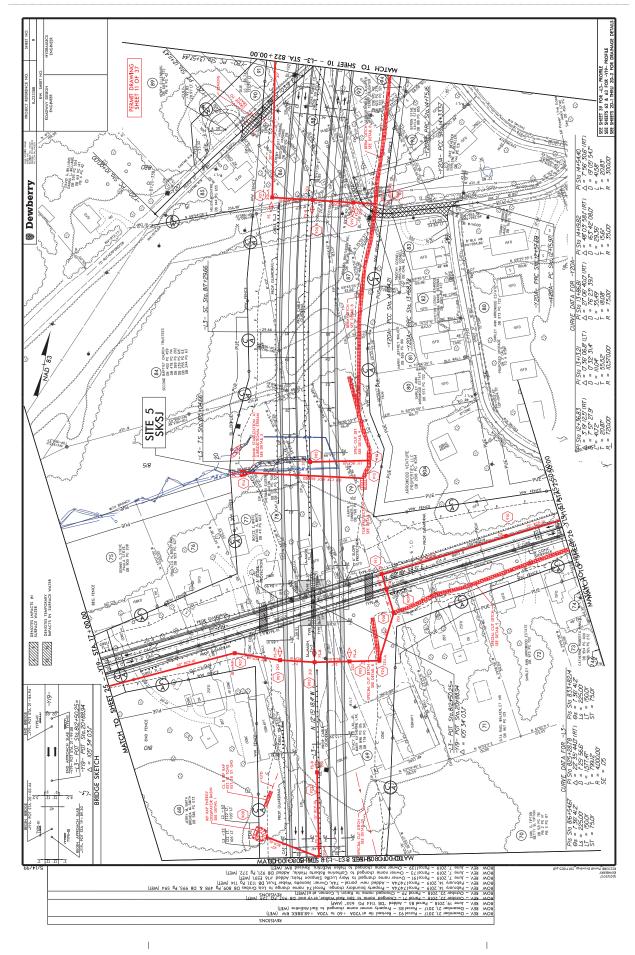


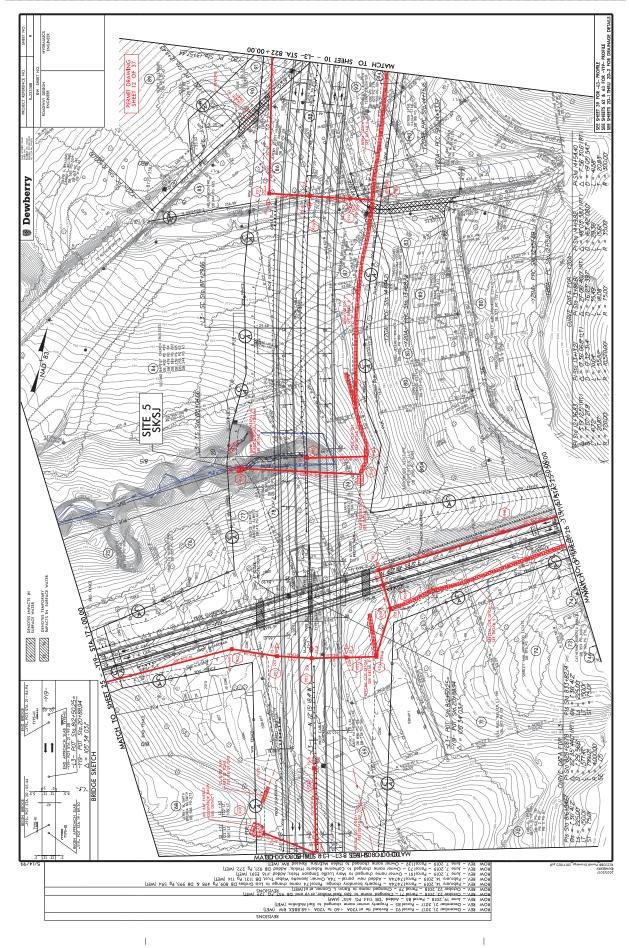


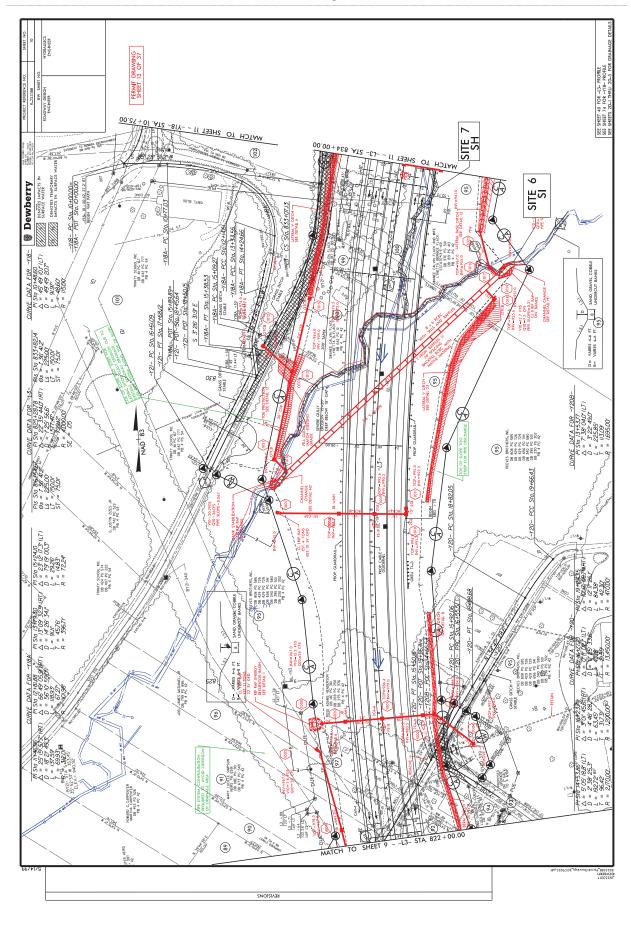


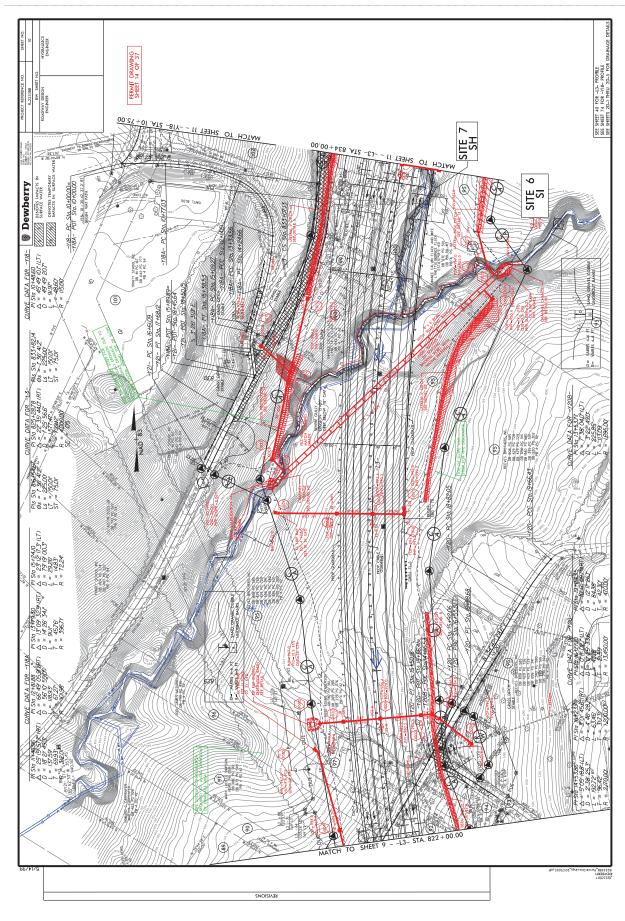








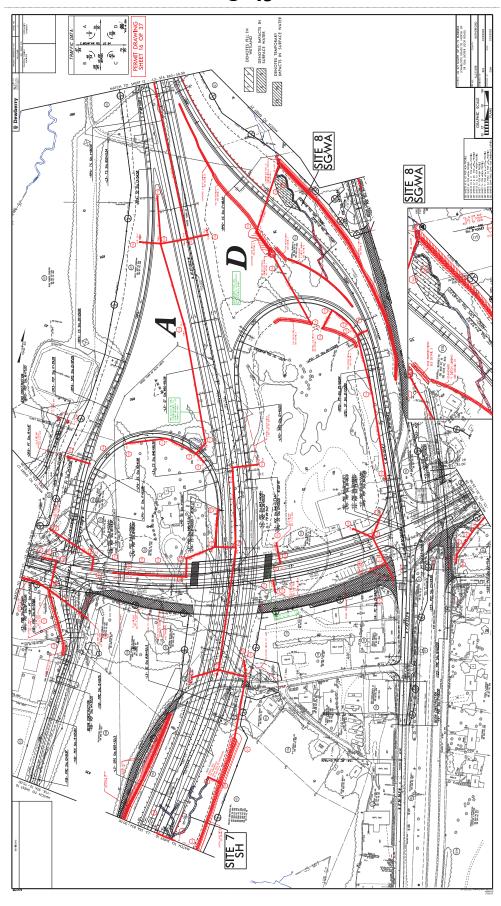


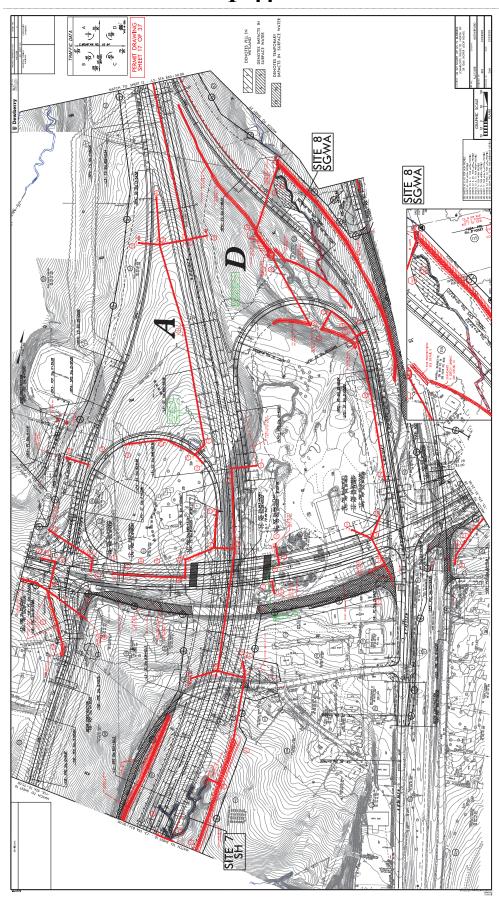


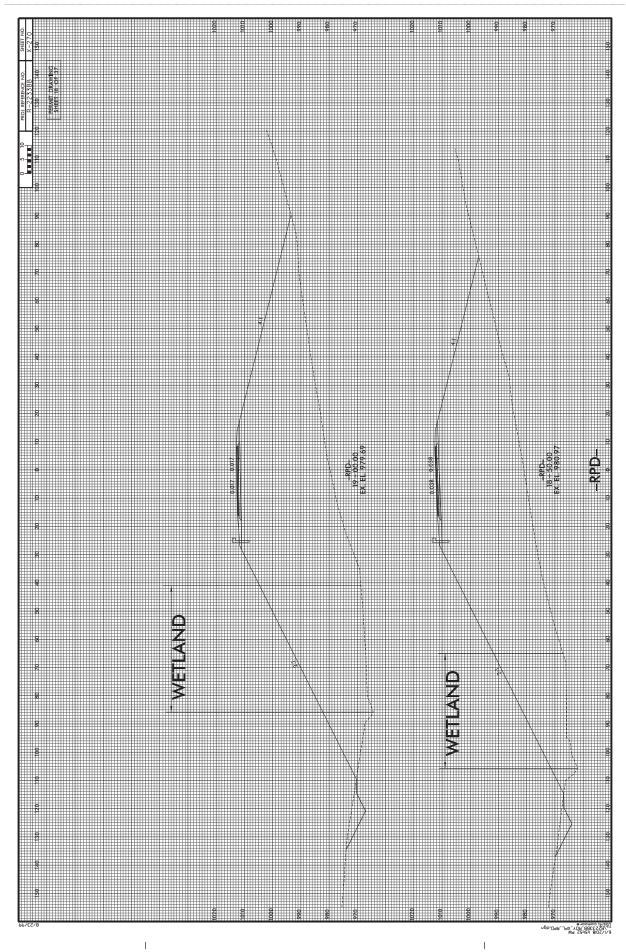
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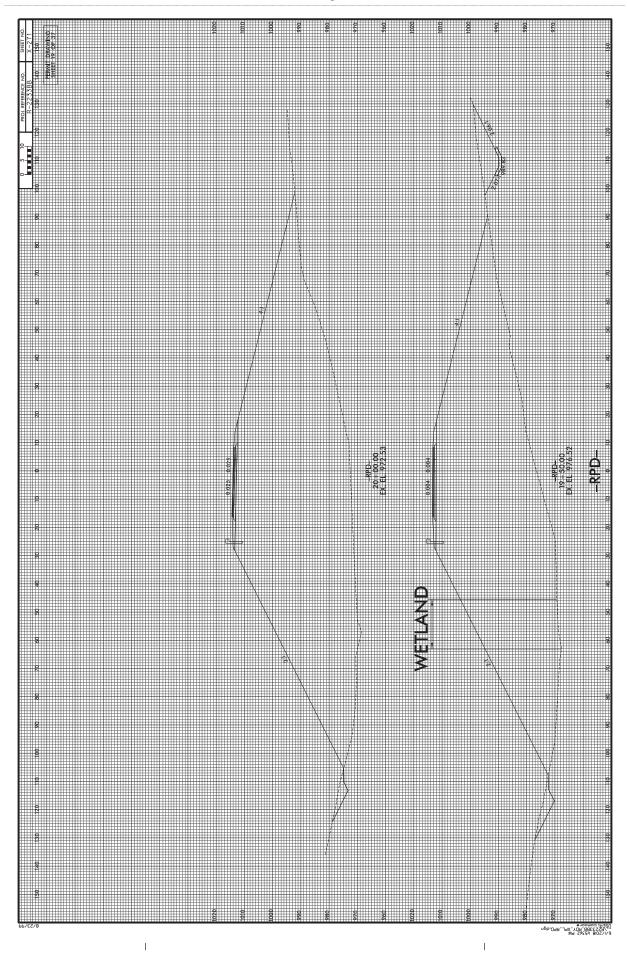
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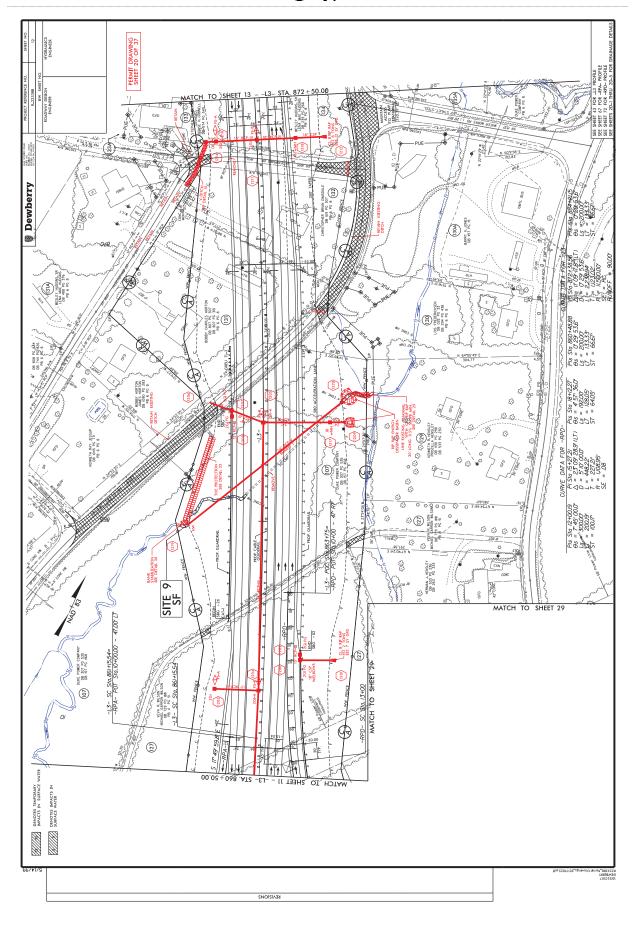
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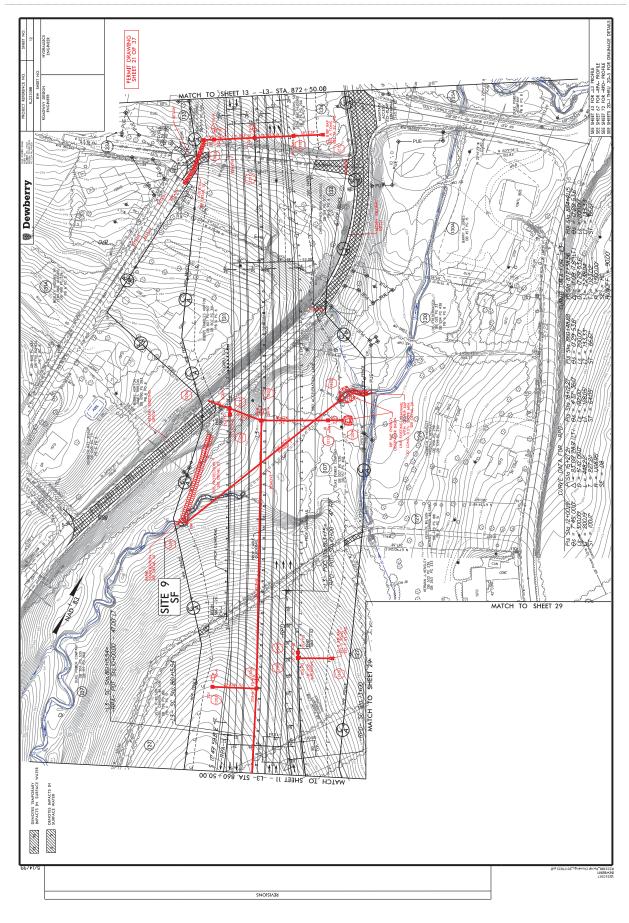


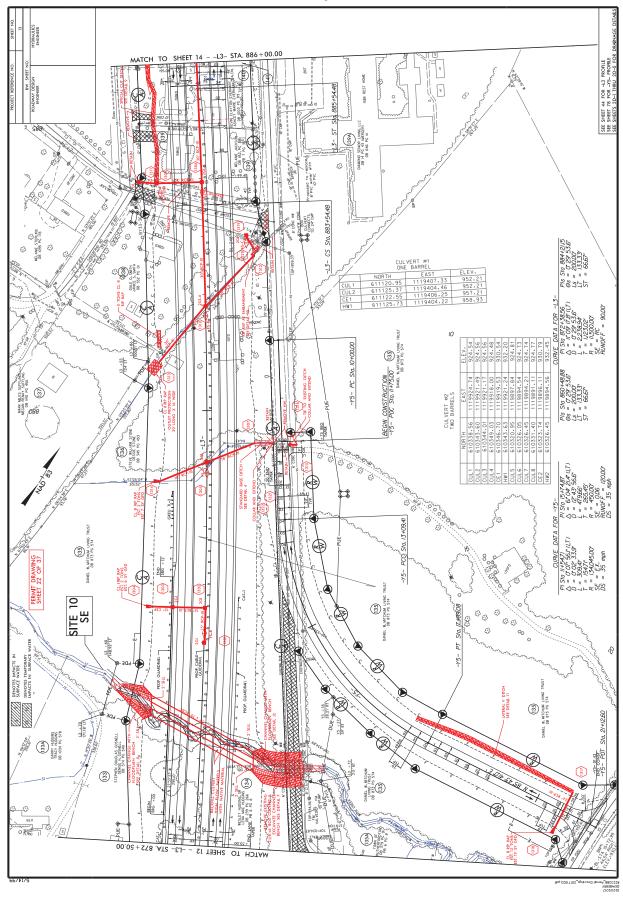


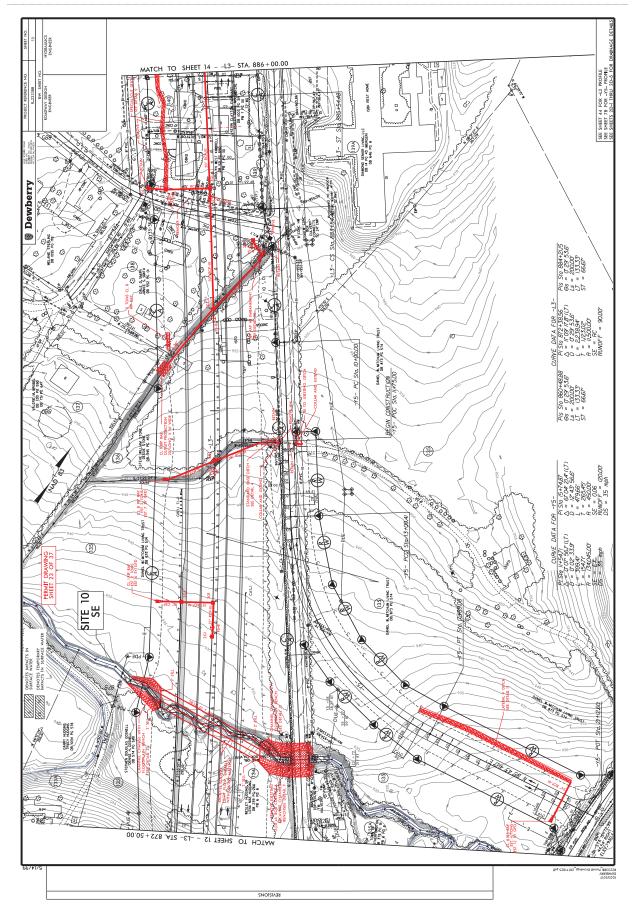


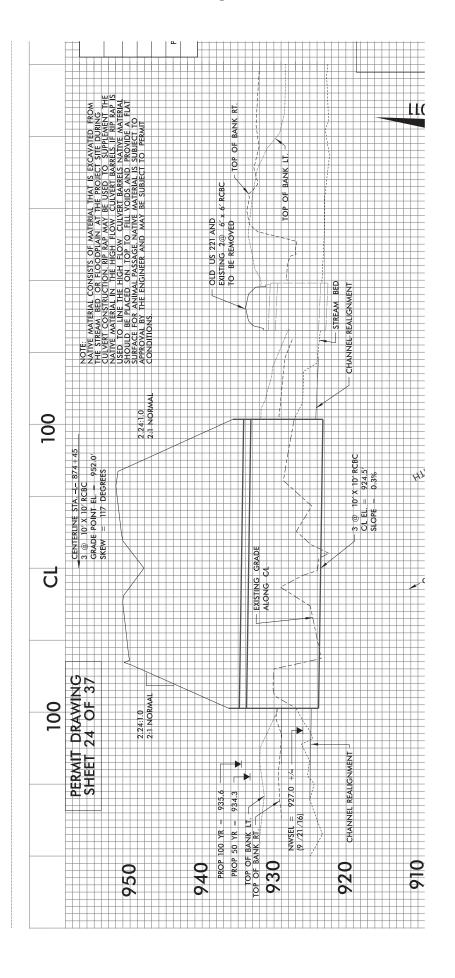


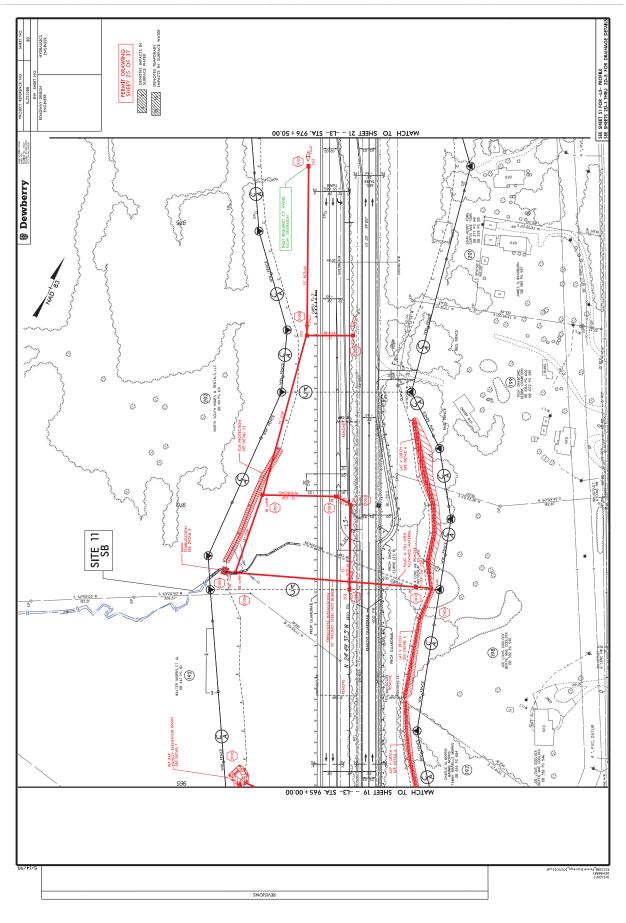


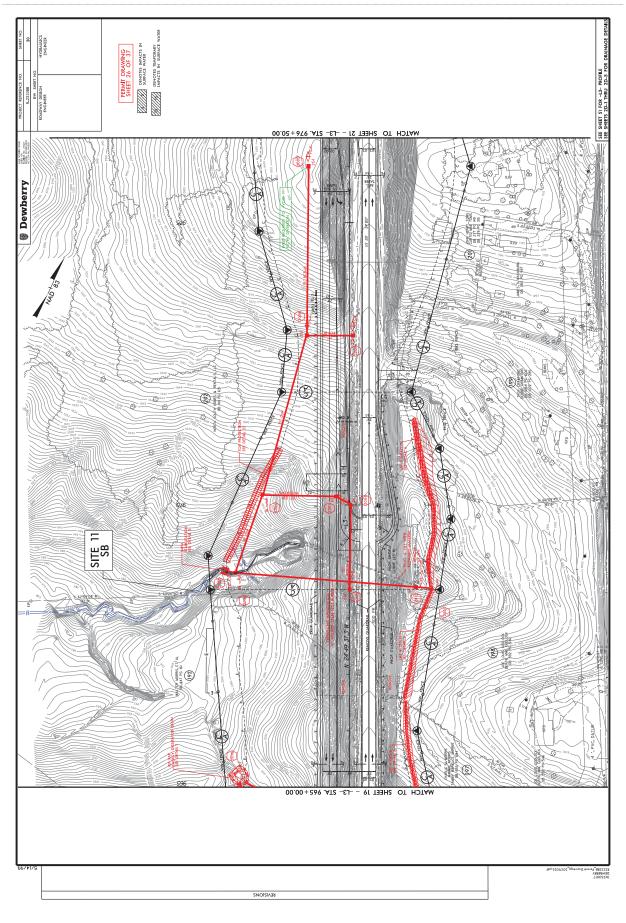


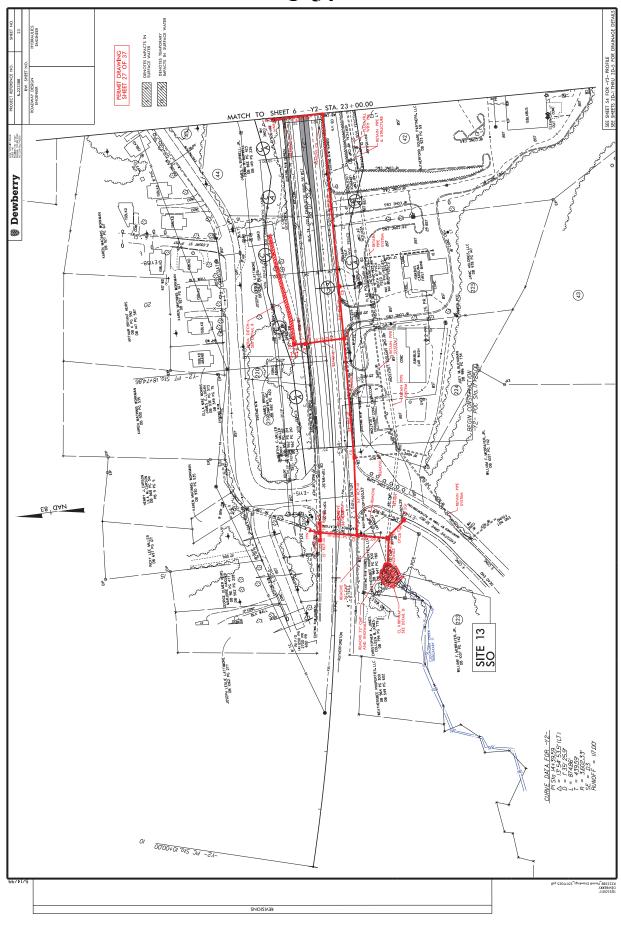


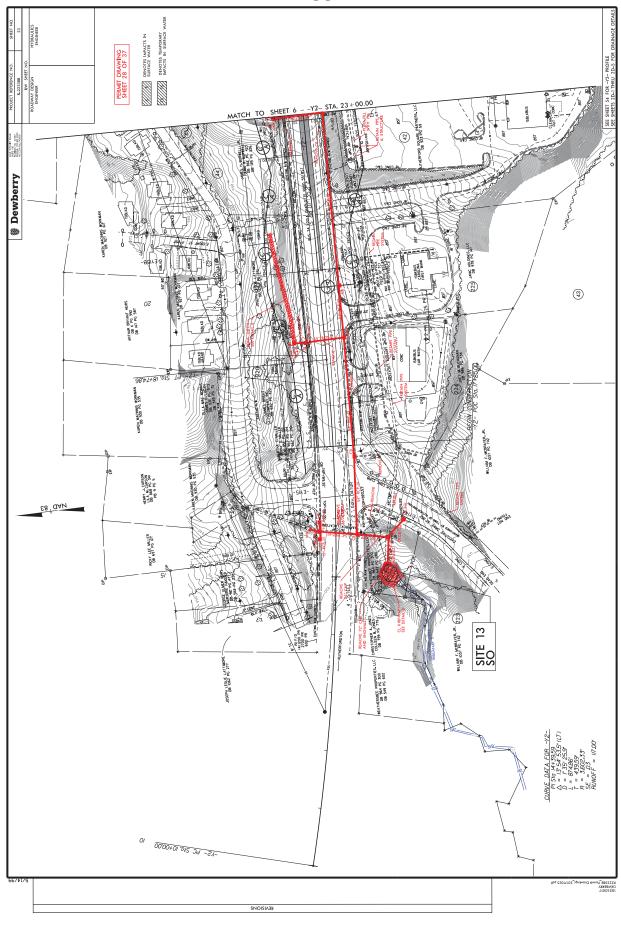


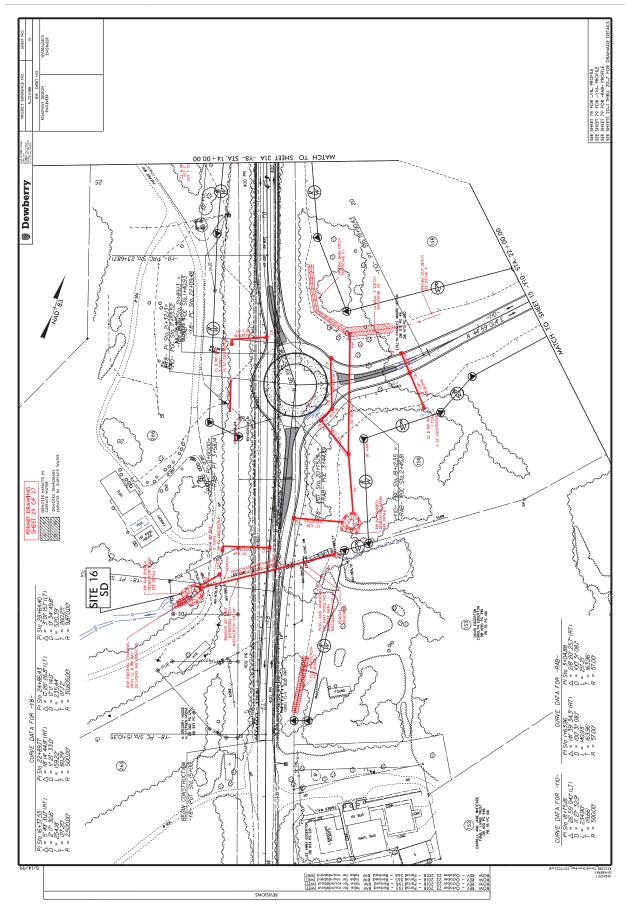




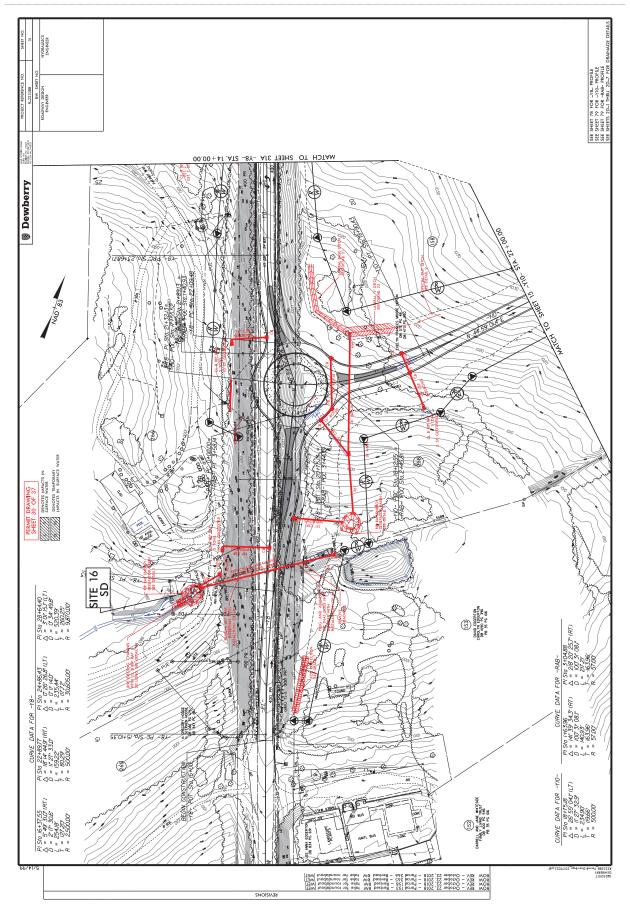


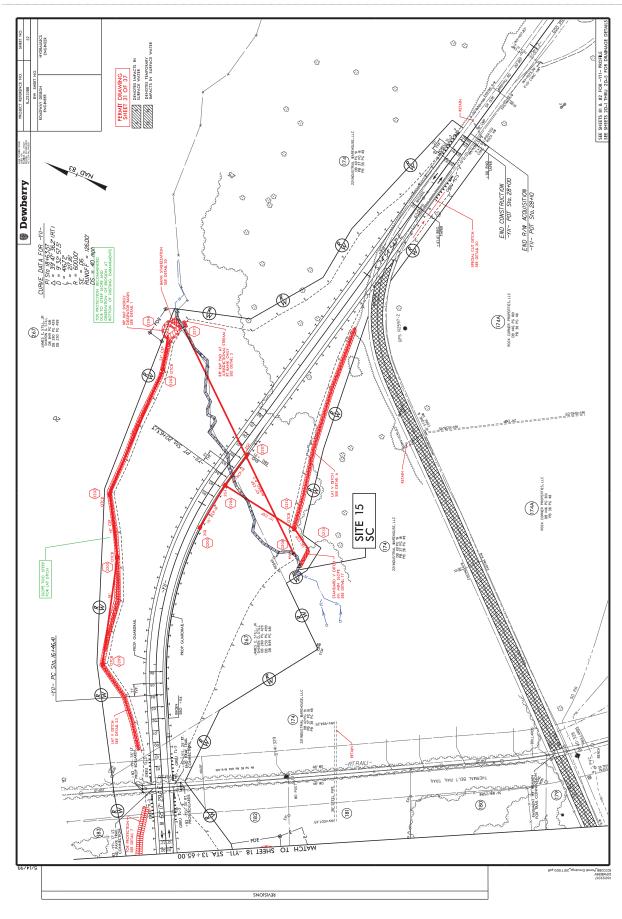


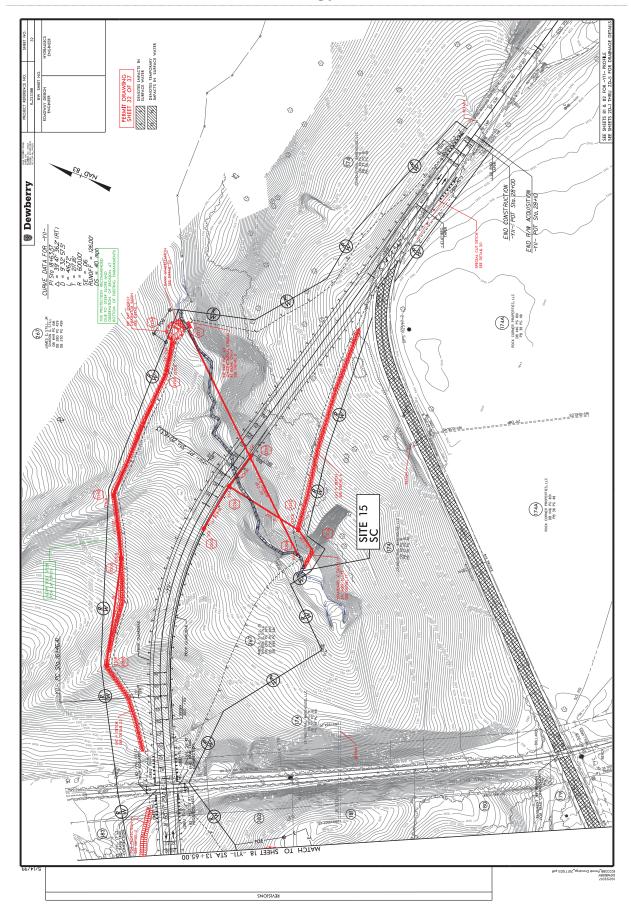


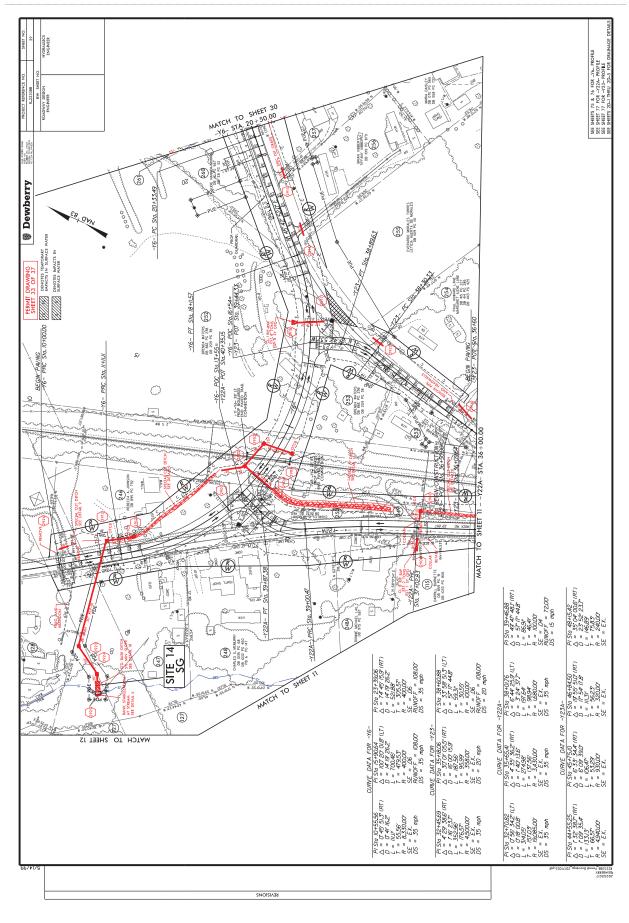


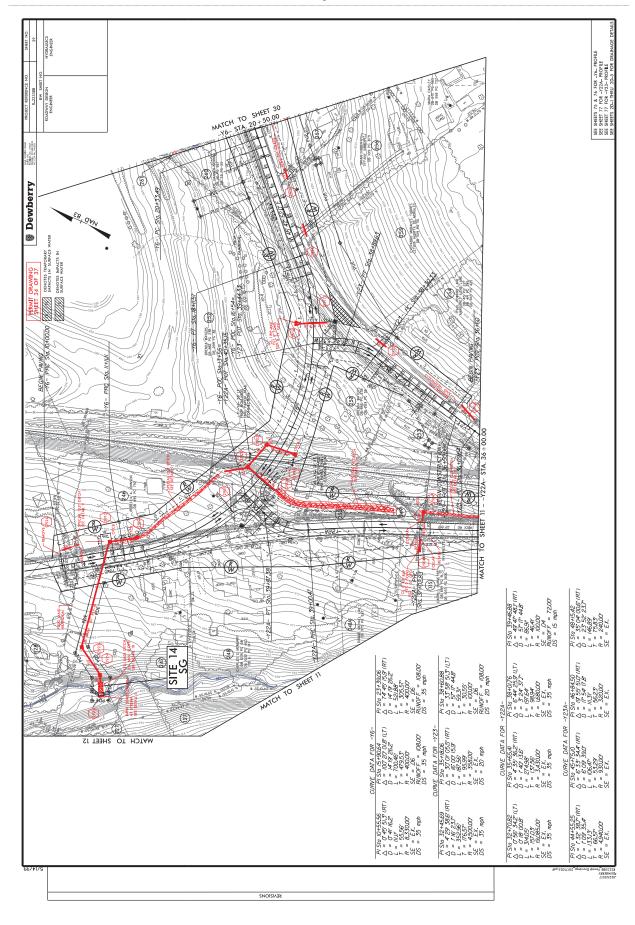
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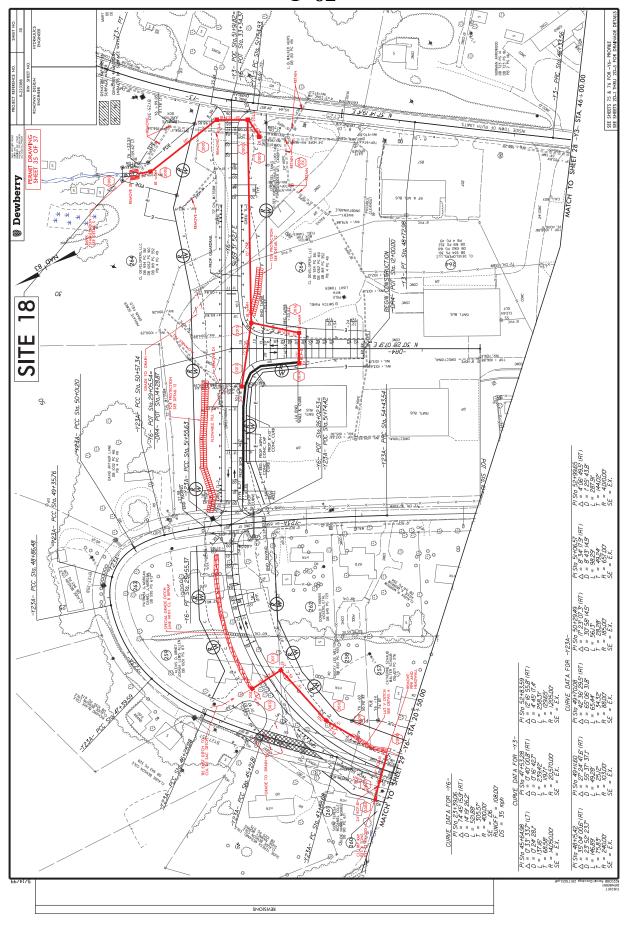


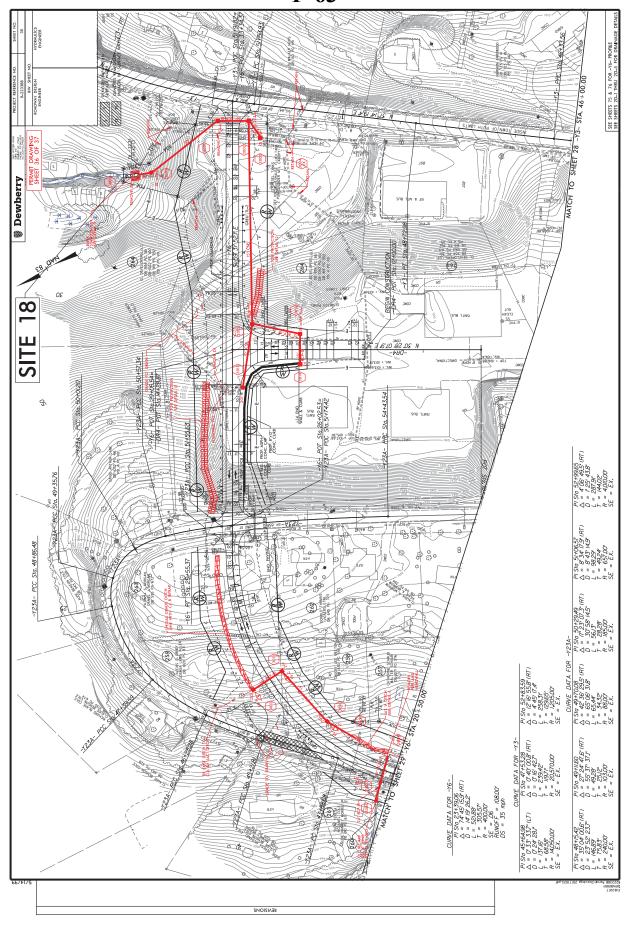






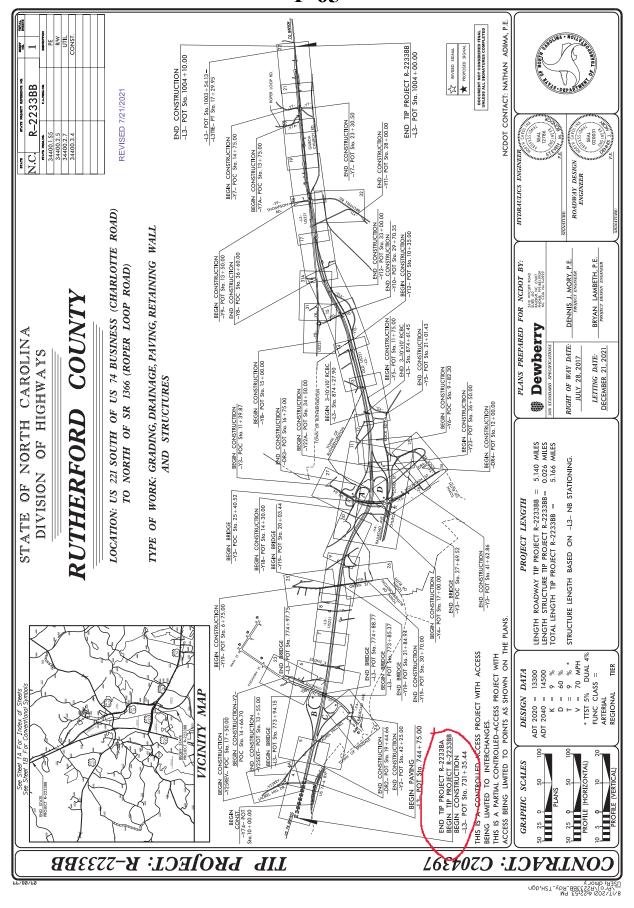






				WEIL	IAN WEI	LAND IMPA	WEILAND AND SURACE WAIER IMPACES SUMMARY WETLAND IMPACTS	100 OC 1	MAKT	SURFACE	DE WATER IMPACTS	MPACTS	
Site No.	9 0	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands	Temp. Fill In Wetlands	Excavation in Wetlands	zed ng nds	Hand Clearing in Wetlands	E. Sel	Temp. SW impacts	Existing Channel Impacts Permanent	Existing Channel Impacts Temp.	Natural Stream Design
-	SN	L3 778+97 TO 779+40 LT	ROADWAY FILL	(90)	(ac)	(ac)	(ac)	(ac)	(ac) < 0.01	(ac) < 0.01	43	34	(11)
	NS 2	Y2 22+05 LT	48" Pipe						< 0.01	< 0.01	24	14	
†	SL/SM	99+26	10' X 7' RCBC						0.09	0.0	992	01	
4 ,	75 5		CHANNEL REALIGNMENT						< 0.01	300	43	1	
	7		5						0.0.	0.0	0		
10	χ	L3 814+76 LT TO 814+87 LT	BANK STABILIZATION						< 0.01	< 0.01	10	17	
n n	र्भ छ	L3 815+11 TO 815+45 KI	ROADWAY FILL/30- CSP ROADWAY FILL						0.02	< 0.01	112	21	
9	S	L3 828+19 TO 828+28 LT	BANK STABILIZATION						< 0.01	< 0.01	11	6	
9	S	L3 830+00	8' X 6' RCBC						90'0		029		
9 1	S O	L3 832+25 TO 832+56 RT	CL. II RIPRAP ON BANKS						< 0.01	< 0.01	34	18	
- 00	SG	RPD 22+04 RT TO 18+22 LT	ROADWAY FILL						0.05		445		
8	WA	RPD 17+38 TO 22+04 LT	ROADWAY FILL	0.11									
∞ ∘	SG	RPD 18+26 TO 18+08 LT	36" PIPE						< 0.01	0	32	Oc.	
0 0	20 17	I3 864+92 I T	BANK STABILIZATION						< 0.01	× 0.0 ×	14	8	
0	SF	L3 866+00	54" RCP-V						0.01		140	,	
			RIIP RAP ENERGY DISSIPATOR BASIN/CL. I RIP										
6	SF	L3 867+00 TO 867+28 RT	RAP IN CHANNEL						< 0.01	< 0.01	55	7	
10	W 1	L3 875+24 LT	FLOODPLAIN BENCH						0.01	< 0.01	772	18	
2 5	9 1	13 874+16 DT	ELOCODE AIN BENCH						0.00		45		
2	Ä	L3 0/41 10 N I	REMOVAL OF EXISTING						0.0		D.		
10	W.	L3 873+90 RT	CULVERT							0.01		21	
=	SS	L3 968+69 TO 968+88 LT	BANK STABILIZATION						< 0.01	< 0.01	10	27	
11	SB	L3 968+64	36" STEEL PIPE						< 0.01		151		
13	SO	Y2 15+24 RT	CL. II RIPRAP						0.02	< 0.01	35	19	
14	SG	Y6 10+23 RT	BANK STABILIZATION						< 0.01	× 0.01	10	24	
2	3	111 25 30 51							200	200	77	1	
15	SC	Y11 22+80	42" CSP						0.05		506		
15	SC	Y11 19+88 RT	PID PAD ENECY						< 0.01	< 0.01	14	18	
9	ć	H 07	DISSIPATOR/CL. B RIPRAP						9	3	ç	ç	
16	SD	Y8 18+04	60" PIPE						< 0.01	0.0	38	01	
16	SD	Y10 15+63 RT	LATERAL V DITCH						< 0.01	< 0.01	18	12	
17	SO	Y2 33+41 TO 34+50 RT	ROADWAY FILL						0.01		143		
18	ΑN	Y6 32+02 TO 32+09 LT	BANK STABILIZATION						< 0.01	< 0.01	13	12	
19	SP	L3 733+34 LT TO 736+81 RT	10' X 8' RCBC						0.14		909		
19	у 6.	L3 /31+4/ IO /32+16 L1 I 3 732+16 TO 732+71 I T	CHANNEL REALIGNMEN						0.02		92		
19	S S	L3 732+71 TO 733+34 LT	CHANNEL REALIGNMENT						0.02		92		
19	S	L3 731+22 TO 731+47 LT	CHANNEL REALIGNMENT							< 0.01	:	12.0	
19	g 0	L3 736+81 TO 737+26 RT	CHANNEL REALIGNMENT						0.01	100	46	180	
20	WB	L3 733+46 LT TO 733+80 LT	CHANNEL REALIGNMENT			< 0.01				0.0		0.01	
FOTALS*:				0.11		< 0.01			0.77	90.0	5615	411	0
ounded to	otals are s	*Rounded totals are sum of actual impacts											
TES: e 4 SL/SM i	is comprise	NOTES. Site 4 SUSM is comprised of both the main jurisdictional stream and a trb. to the left of the main stem.	and a trib to the left of the main stem							NC D	NC DEPARTMENT OF TRANSPORTATION	OF TRANSPO	RTATION
thotheria 17 is a sm.	n sneet no ht of L3. nall area be	are tragging of the total of the steam is completely covered by todoway. The drain clinical to the grammer of the total clinical of the semail area between piped streams that has been covered up by the roadway.	ed by loadway. The dialitage triat wo vered up by the roadway.	or alog aver on or	si ilia sii aalii a	newad falled	esodoid ain iii di	o igreral o			DIVISION 6	DIVISION OF HIGHWAYS 6/25/2021	70
2,3, and 1	12 have be ot in the ori	Site 2,3, and 12 have been removed due to those sites not being jurisdictional. Site 18 was not in the original JD file, therebre it never received a JD ID. During the 4C meeting, it was agreed upon to keep the impact site	g jurisdictional. a JD ID. During the 4C meeting, it w	as agreed upon	to keep the in	pact site.					RUTH R-2	RUTHERFORD R-2233BB	

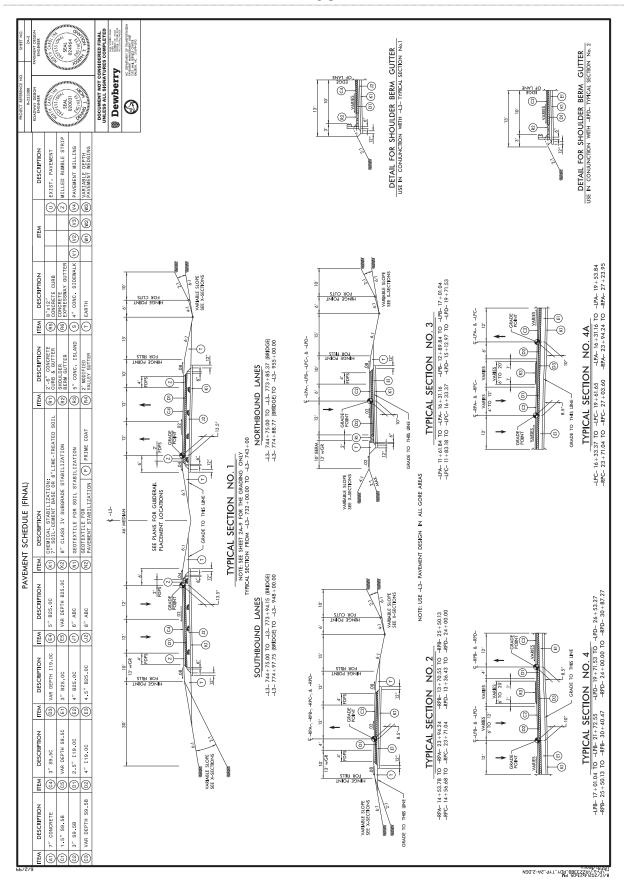
REVISED 7/1/21

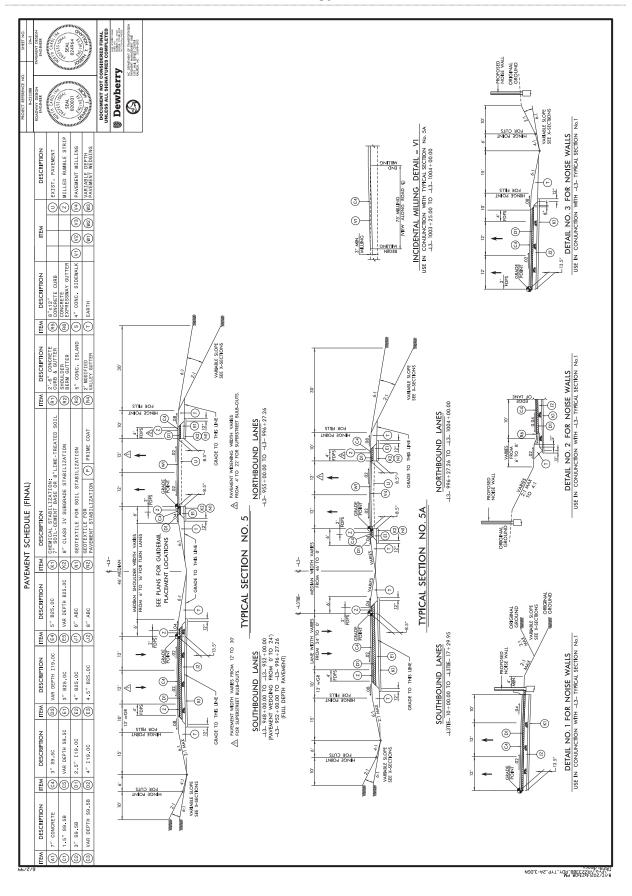


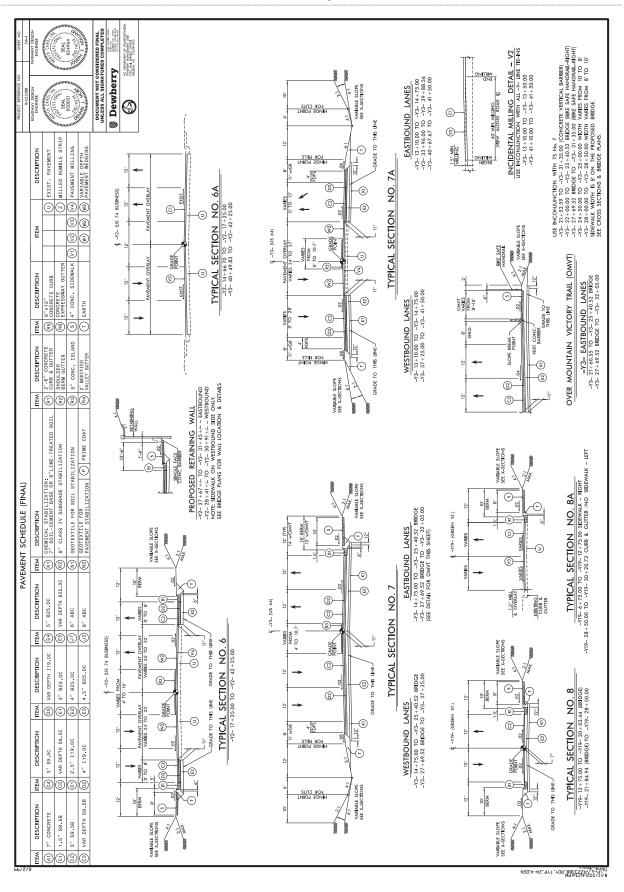
		STATE OF NORTH	CAROLIN	CAROLINA, DIVISION OF HIGHWAYS	•		MODEL BERENGE NO. SHEET NO. R-223388 18
BOUNDARIES AND PROPERTY:		Note: Not to	-	Subsurface Uti		WATER:	
State Line ————————————————————————————————————						Water Manhole	⊗
County Line			CSX TRANSPORTATION ○			Water Meter	0
Township Line			MICEPOST 35		ć ć	Water Valve	8
City Line		Swirch Swirch	SWITCH			Water Hydrant	•
Reservation Line		Kk Abandoned	 		Vineyard	UG Water Line LOS B (S.U.E*) —	
Property Line		RR Dismantled		EXISTING STRUCTURES:			
Existing Iron Pin	⊙å					U/G Water Line LOS D (S.U.E*) —	
Computed Property Corner	*	RIGHT OF WAY & PROJECT CONTROL	VIROL:	Ш	CONC		A/G Water
Property Monument	□3	Secondary Horiz and Vert Control Point	•	Bridge Wing Wall, Head Wall and End Wall –) எஸ) conc mw (i	
mber	(53)	Primary Horiz Control Point	0			TV Bododes	
×	* 	Primary Horiz and Vert Control Point	•	nd Wall	CONC HW	IV redesidi	3 (
Proposed Woven Wire Fence		Exist Permanent Easment Pin and Cap	♦	Pipe Culvert		IV lower	∂ [
Proceed the principal of the process		New Permanent Easement Pin and Cap ——		Footbridge ————————————————————————————————————	Y	U/C IV Cable Hand Hole	T
Proposed Cream Eline Force		Vertical Benchmark	X	Drainage Box: Catch Basin, DI or JB ———		U/G TV Cable LOS B (S.U.E.*) —	
	 	Existing Right of Way Marker	\triangleleft	Paved Ditch Gutter		U/G TV Cable LOS C (S.U.E.*) —	
	1 ;	Existing Right of Way Line			6		<u> </u>
		New Right of Way Line		Storm Sewer			
EXISTING Endangered Animal boundary ————————————————————————————————————) (U/G Fiber Optic Cable LOS C (S.U.E.*))
Existing Endangered Plant Boundary ————————————————————————————————————	-	New Right of Way Line With Fin and Cap —		UTILITIES:		U/G Fiber Optic Cable LOS D (S.U.E.*)	.*)
	{	New Right of Way Line with		POWER:	_	GAS:	
	×-8-3€	Now Control of Accounting New Market		Existing Power Pole	•	Gas Valve	
Potential Contamination Area: Soil	. M. — s — M.	Concrete CA Marker		Proposed Power Pole	0	Soc Meter	• •
Known Contamination Area: Water	· ₩—»— ₩-	Existing Control of Access		Existing Joint Use Pole ————————————————————————————————————	+	11/6 Gae Line 108 B (\$11E*) ——	
Potential Contamination Area: Water	- X w - X ·	New Control of Access	9 6	Proposed Joint Use Pole ————————————————————————————————————	-		,
Contaminated Site: Known or Potential	X X	Existing Excession in the contract of the cont	} '	Power Manhole	<u>@</u>	U/G Gds Line LOS C (S.U.E.*)	
ULTU		Existing Education File	 		×	U/G Gas Line LOS D (S.U.E.*)	
Gas Pump Vent or U/G Tank Can	0	New Temporary Construction Easement] [3	Above Ground Gas Line	900 000
) ©	New Temporary Drainage Easement	TDE		3	SANITARY SEWER:	
ii ji	ıv C	New Permanent Drainage Easement	PDE	U.G. rower cable nand noie		Sanitary Source Manhole	•
well) = ;	New Permanent Drainage / Utility Easement	—— DUE	H-Frame Pole	Ī	Sanitary Sewer Cleanout	● ④
Small Mine	×	New Permanent Utility Easement	PUE	Power Line LOS B		Company Company	> :
Foundation ————————————————————————————————————	П	New Temporary Utility Easement	TUE	U/G Power Line LOS C (S.U.E.*)		Co sanitary sewer Line	A/G Sanitary Sewer
Area Outline		New Aerial Utility Easement	—— AUE	U/G Power Line LOS D (S.U.E.*)		Above Ground Sanitary Sewer	
Cemetery ————————	-		2	JAN CHARLES		SS Forced Main Line LOS B (S.U.E.*)	133
Building	5	ROADS AND RELATED FEATURES.	ڹ			SS Forced Main Line LOS C (S.U.E.*)	
Sch88	- -[š	Existing Telephone Pole	+	SS Forced Main Line LOS D (S.U.E.*)	
Cherch]+{	Existing cage of ravellient		Proposed Telephone Pole	¢		
]	Existing Corb	 	Telephone Manhole	⊚	MISCELLANEOUS:	
HVDROI OCV.		Proposed Slope Stakes Cut	 	Telephone Pedestal	⊟	Utility Pole	•
Stroom or Body of Water		Proposed Slope Stakes Fill	1 1 1 1 1 1 1	Telephone Cell Tower	H\$	Utility Pole with Base	
::		Proposed Curb Ramp	8	U/G Telephone Cable Hand Hole	I	Utility Located Object	•
Ilyano, Ilon ol nasalvali	1	Existing Metal Guardrail		UG Telephone Cable LOS B (S.U.E.*)	1 1 1 1	Utility Traffic Signal Box	
st — —	I	Proposed Guardrail	-			Utility Unknown U/G Line LOS B (S.U.E.*)	J.E.*)
butter zone 1	- BZ 1	Existing Cable Guiderail	0 0 0			U/G Tank; Water, Gas, Oil	
	- BZ 2	Proposed Cable Guiderail			1	Underground Storage Tank, Approx. Loc.	0c. — (ušī)
How Arrow		Equality Symbol	•		: 	A/G Tank: Water. Gas. Oil	
Disappedring Siredm ————————————————————————————————————		Pavement Removal				Geoenvironmental Borina] {
/)	VEGETATION:				U/G Test Hole LOS A (S.U.E.*)	•
Wetland	ж.	Single Tree	43		- 1 1 2 1	Abandoned According to Hillity Becords	
Proposed Lateral, Tail, Head Ditch ————	A si	Single Shrib	3 0		1 1 1 1 1 1	Abditionled Accoloning to Olimy Neco	
False Sump	\Diamond			U/G Fiber Optics Cable LOS D (S.U.E.*)——	-1 80 		

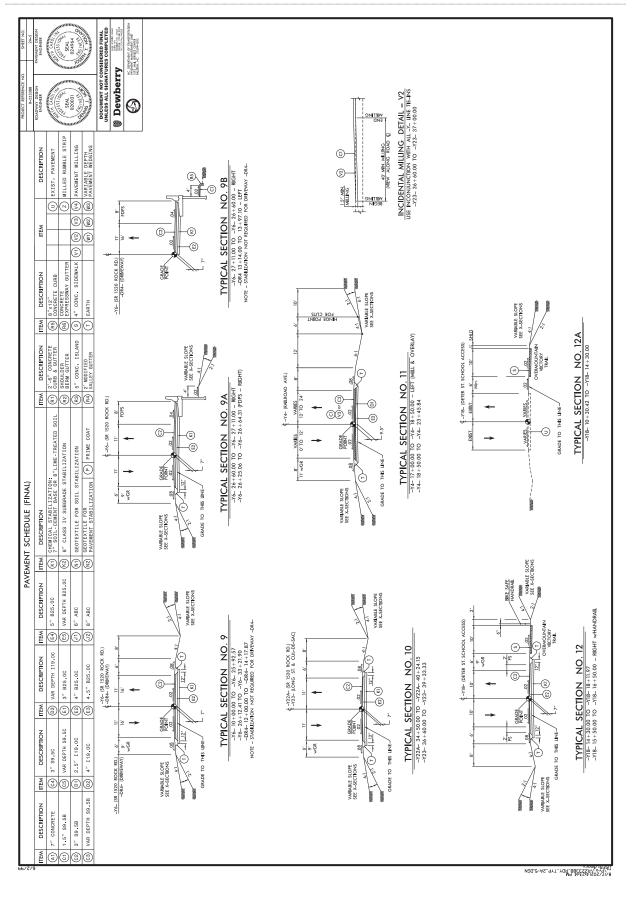
66/2			PAVEMENT SCHEDLILE (FINAL)			PROJECT REFERENCE NO. SHEET NO.
/9	DESCRIPTION	ITEM	DESCRIPTION	ITEM	DESCRIPTION	ESIGN PA
4	7" CONCRETE TRUCK APRON	(H)	PROP. APPROX. 5.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AM AVERAGE RATE OF 570 LBS. PER SO. YARD.	(A)	PROPOSED 2'O" MODIFIED VALLEY GUITER	SEAL DESCRIPTION OF THE PROPERTY OF THE PROPER
(2)	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.58, AT AN AVERAGE RATE OF 165 LBS. PER S0. YARD.	(E5	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.00. AT MA VERRAGE FAR FOF 14 LESS. PRE NO. AND PERT DEPTH TO BE LACED IN LAYERS NOT LESS THAN 3. ON OREATER THAN 5.5. IN DEPTH.	RS	PHOPOSED 8" x 12" CONCRETE CURB	PO CONE
(22)	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.55, AT AN AMERAGE RATE OF 165 LBS. PER SO. YARD IN EACH OF TWO LAYERS.	(5)	PROP. 6" AGGREGATE BASE COURSE	(Re	PROPOSED CONCRETE EXPRESSWAY GUTTER	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED THE STATE OF T
3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.58, AT AM AVERAGE RATE OF 110 LBS. PER S0. YARD PER 1" IN DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.	(2)	PROP. 8" AGGREGATE BASE COURSE	(v)	4" CONCRETE SIDEWALK	SALT-MOLE AN EXPERT AN EXPE
(2)	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER S0. VARD IN EACH OF TWO LAVERS.	(₹)	PROP. CHEMICAL STABILIZATION (SOIL-CEMENT BASE/LIME-TREATED SOIL). BASE TREATED WITH CHEMENT A RATE OF 56 LBS. PER SO. YARD & 7" DEPTH OB SOIL TREATED WITH LIME AT A RATE OF 24 LBS. PER SO. YARD & 8" DEPTH.	F	БАЯТН МО	Ë
(05)	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.50, AT AM AVERAGE RATE OF 112 LBS. PER S0. YARD PER 1" IN DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	(\$)	PHOP. 8" CLASS IV SUBGRADE STABILIZATION	(3)	EXISTING PAVEMENT 2.	
(D)	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AM AVERAGE RATE OF 285 LBS. PER SG. YARD.	(<u>z</u>)	GEOTEXTILE FOR SOIL STABILIZATION	(5)	3. INCIDENTAL MILLING (SEE MILLING DETAIL V1)	
(D2	PROP. APPROX. 4.0" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SG. YARD.	(N SA)	GEOTEXTILE FOR PAVEMENT STABILIZATION	(V2)	INCIDENTAL MILLING (SEE MILLING DETAIL V2) 5.	
(S)	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE 119.0C, AT AN AVERAGE RATE OF 114.LBS, PER SG, YARD PER 1" DEPTH 10 BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4" IN DEPTH.	°, ï.	PRIME COAT AT THE NORMAL APPLICATION RATE OF 0.85 GAL. PER SG. YARD	(\$)	1.5 " PAVEMENT MILLING 6.	ALL DRIVENAY RADII ARE 10' UNIESS SHOWN OTHERWISE ON PLANS.
m T	PROP. APPROX. 3.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SG. YARD.	(<u>E</u>)	2'-6" CONCRETE CURB AND GUTTER	<u>\$</u>	O" TO S" PAVEMENT MILLING	
E2	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SO. YARD.	(R2)	SHOULDER BERM GUTTER (SBG)	N	MILLED RUMBLE STRIP	
(E3)	PROP. APPROX. 4.5" ASPHALT CONORETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SO. YARD.	(%)	5" MONOLITHIC CONGRETE ISLAND (KEYED IN)	(¥)	W2 W3 VARIABLE DEPTH ASPHALT (SEE WEDGING DETAILS ON THIS SHEET)	
	2.7-7-7-8-8-8-8-8-8-8-8-8-8-8-8-8-8-8-8-8	(S) (S) (7/	We now us 27) When the was 21) When the was 21		GRADE TO THIS LINE GRAD TO THIS LINE GRAD TO THIS LINE GRAD TO THIS LINE GRAD TO T	
USE	12-2014	DETAIL -		۵	DETAIL FOR CHEMICAL STABILIZATION—GEOTEXTILE FOR PAVEMENT STABLIZATION WITH ABC USE IN CONJUNCTION WITH TAPICAL SECTIONS No.1.5 13,8 4 to WHEM EGOTETILE IS REQUIRED. TOR INCAMENS SEE SHEET YOU.	
	GEOTEXTILE FOR SOLL STABULZATION SOLL WIDTH 13" WIN TITP!		GEOTESTILE FOR PAMEMENT STABLLANTON PAMEMENT STABLLANTON		TO DESCRIPTION OF THE PROPERTY	
ı	LINE TYP)	EOTEXTILE CROSS-	SUMPEL UME SUMPEL UME SUMPEL UME PORTECTION (CD) SUBGRADE (2 (TTP))	Ü	CRADE TO THIS LINE CRADE	
MT_VGH_88888888888888888888888888888888888	GEOTEXTILE FOR SOIL STABILIZATION PLACEMENT (PLAN VIEW) (100% COVERAGE REQUIRED)	GEOTEX			DETAIL FOR CHEMICAL STABILIZATION—GEOTEXTILE FOR PAYEMENT STABILIZATION WITH ASPHALT BASE LOUGH TO COMUNICTION WITH THECAL SECTIONS IN 0.7, 7.4, 8, 9, 94, 98, 10, 12, 15, 16, 17, 18, 19, 19, 21, 22, 8, 23 WHERE GEOTEXTILE IS REQUIRED. FOR LOCATIONS SEE SHEET 3G-1.	

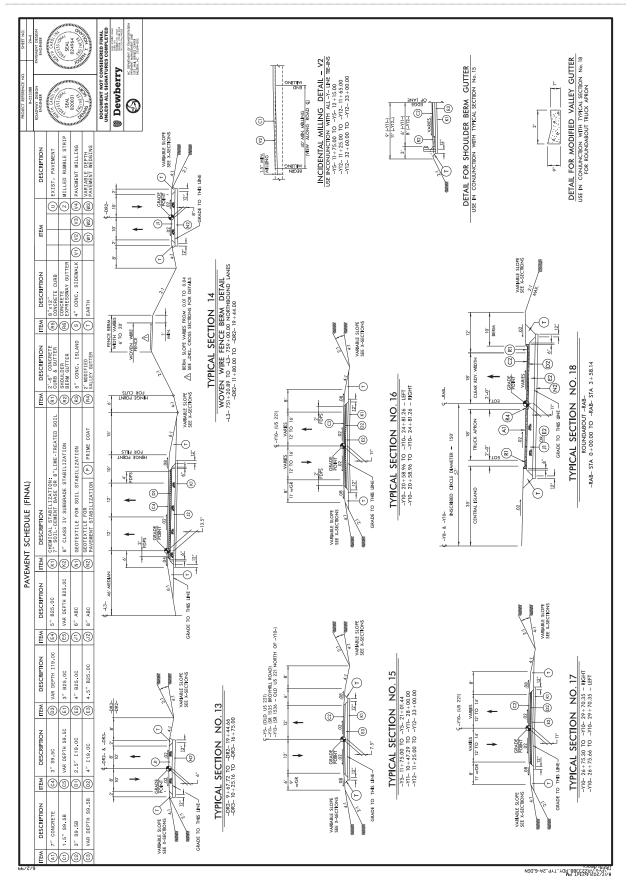
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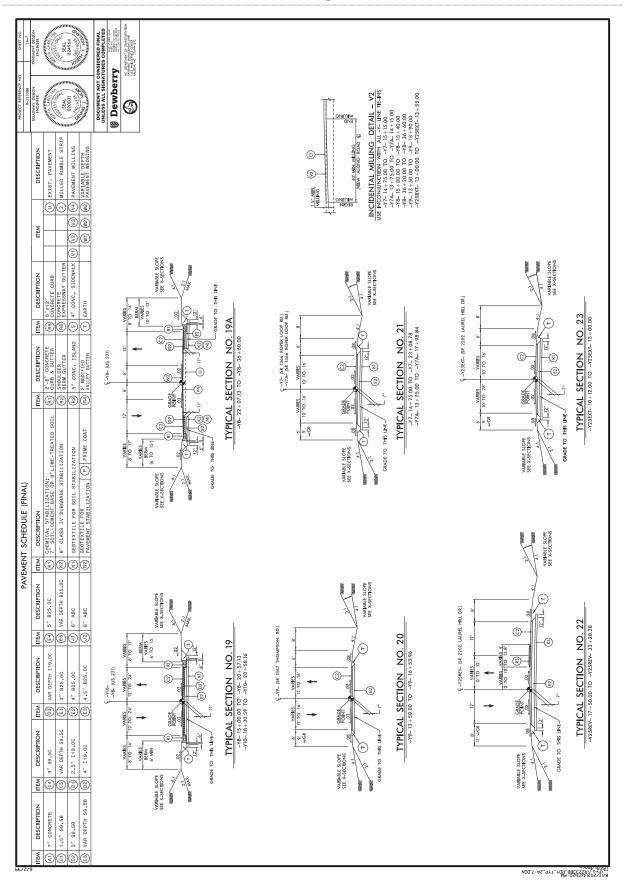


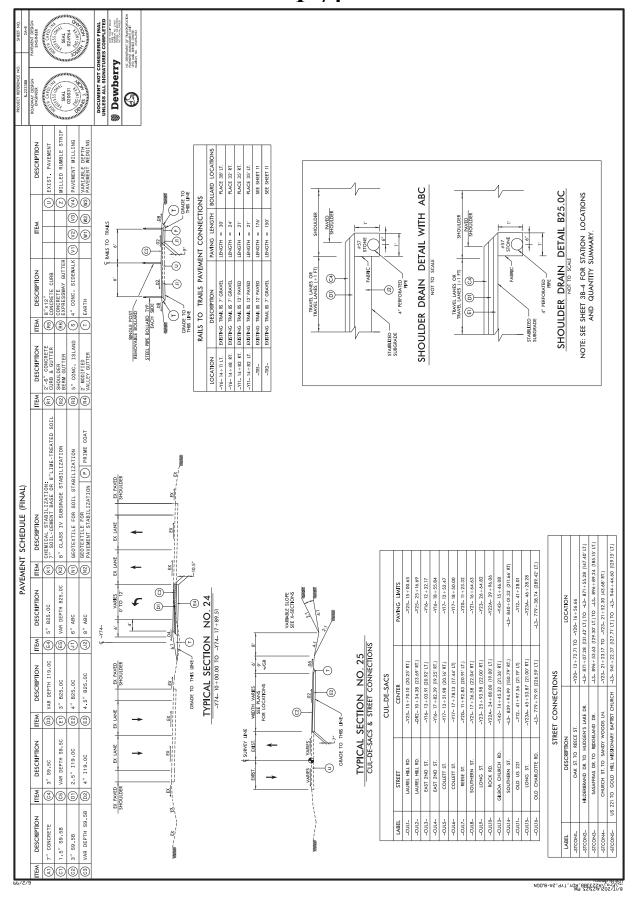


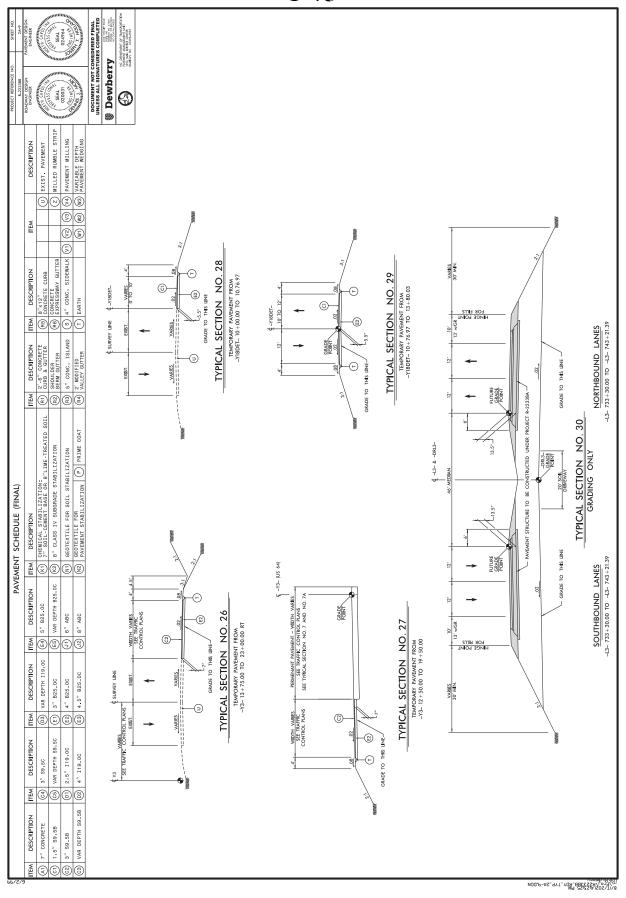


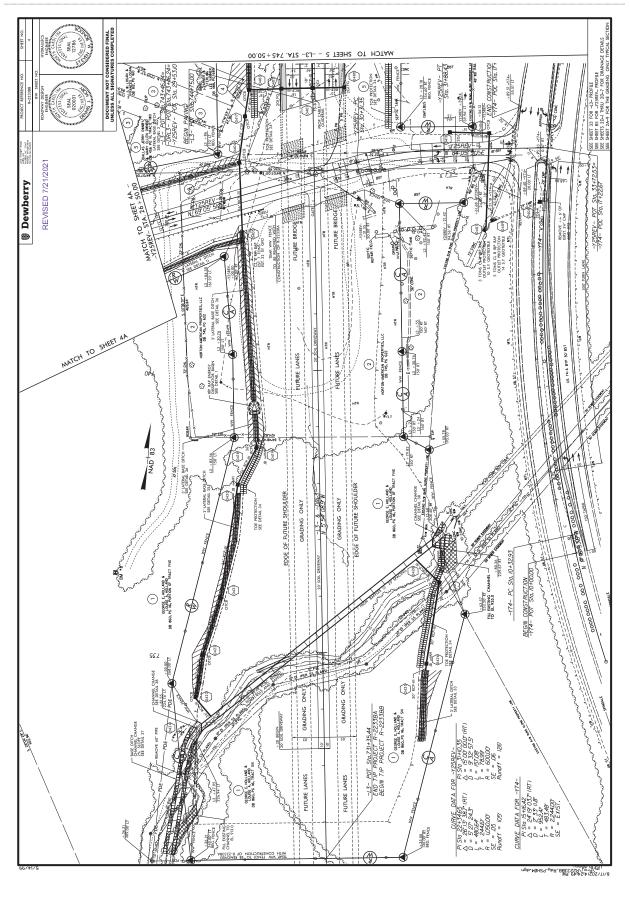


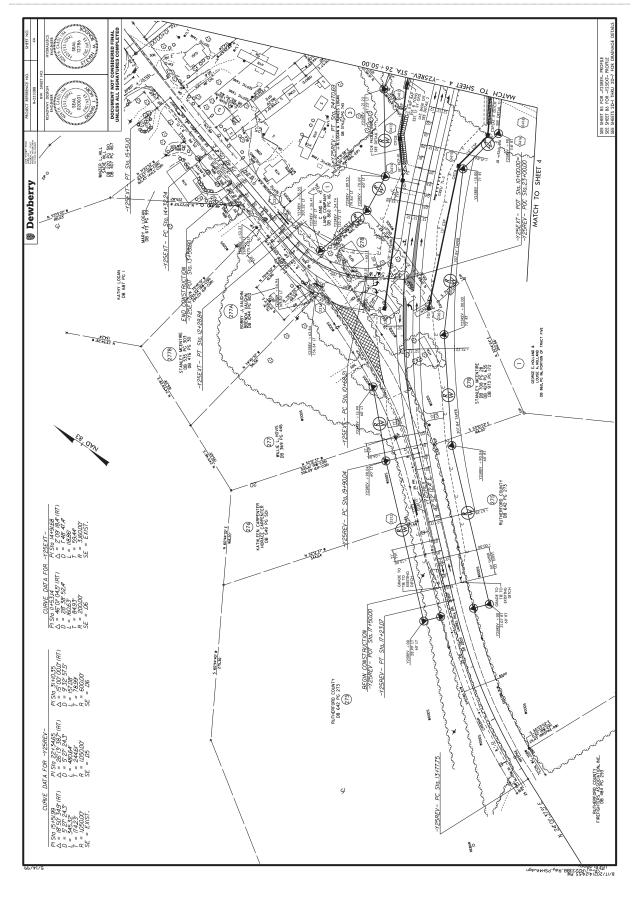
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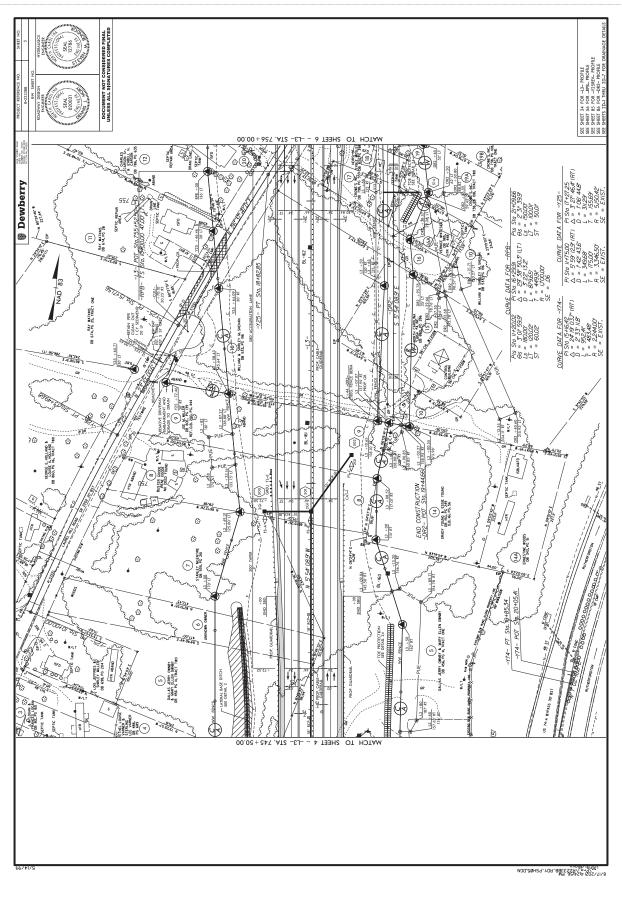


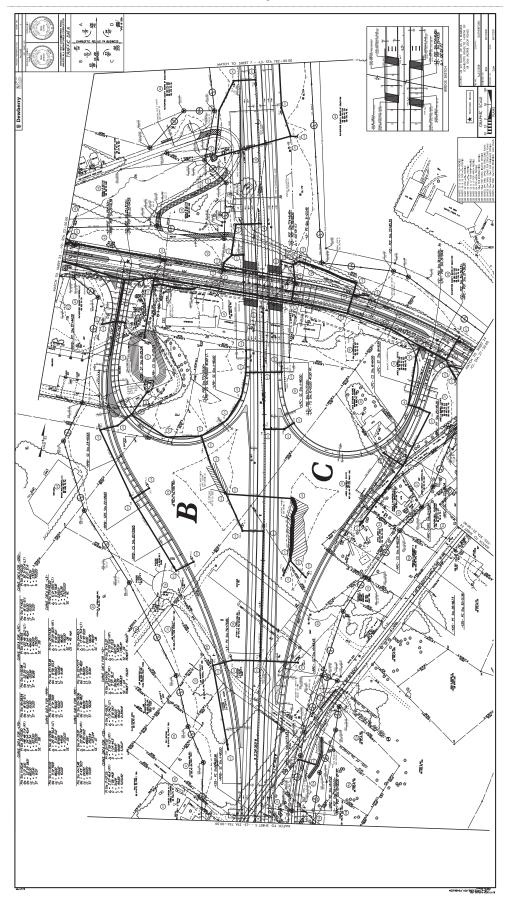


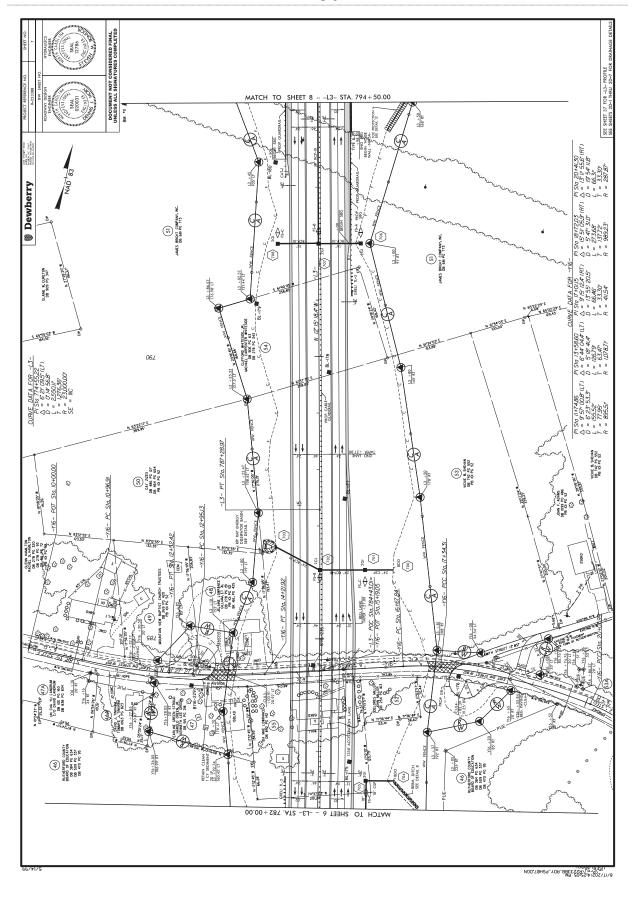


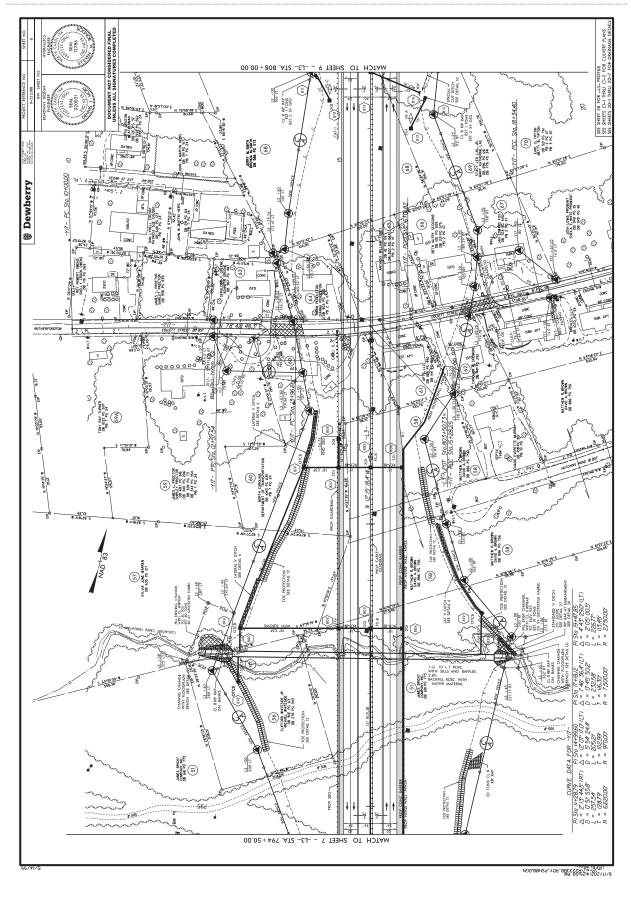


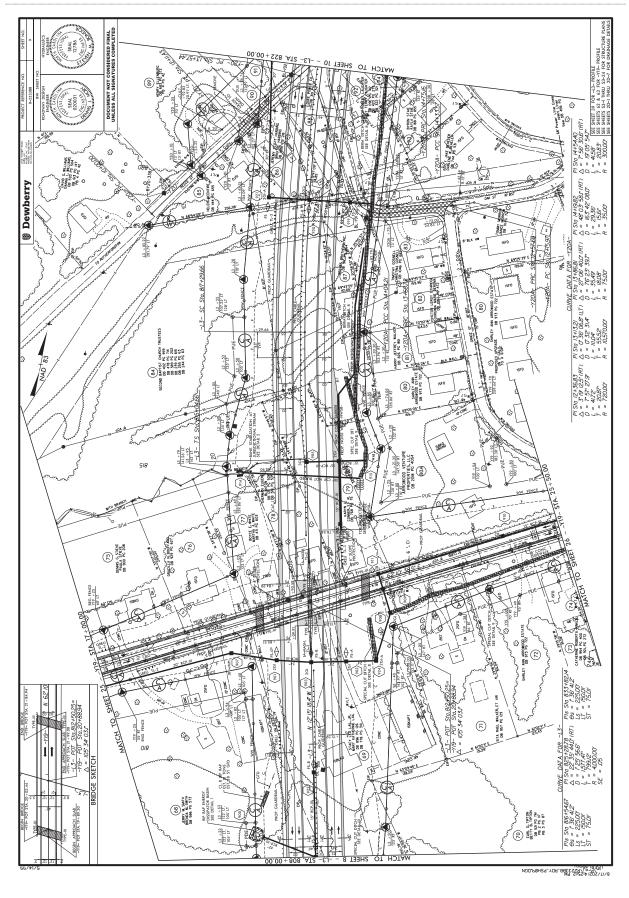
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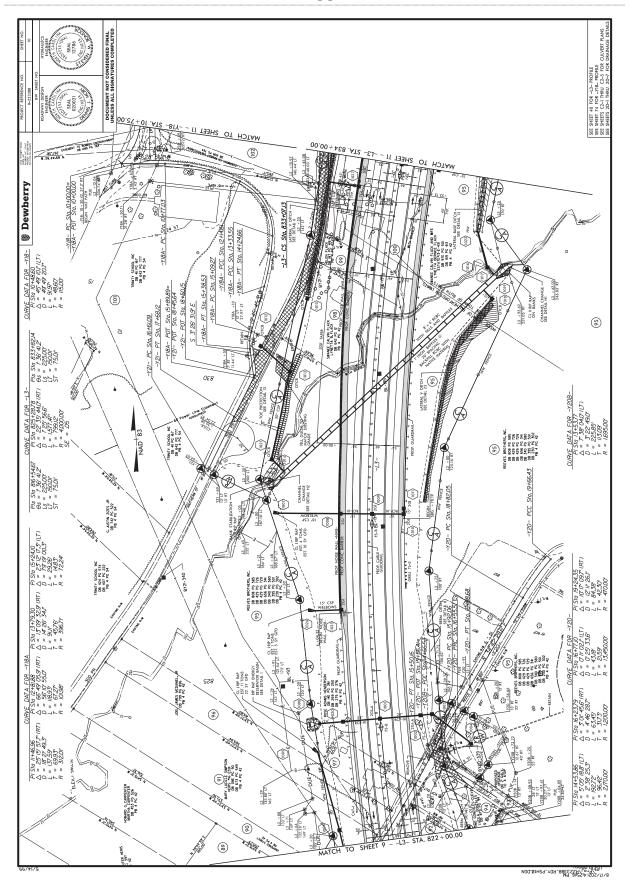


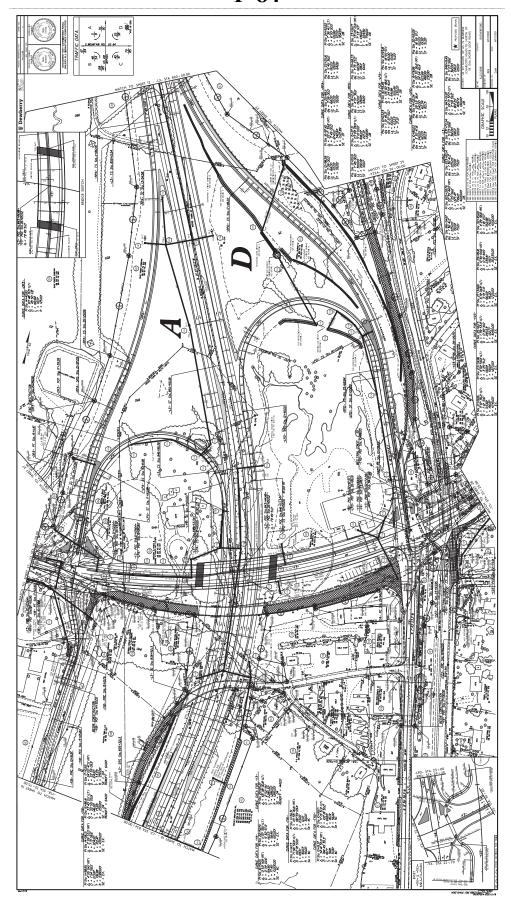


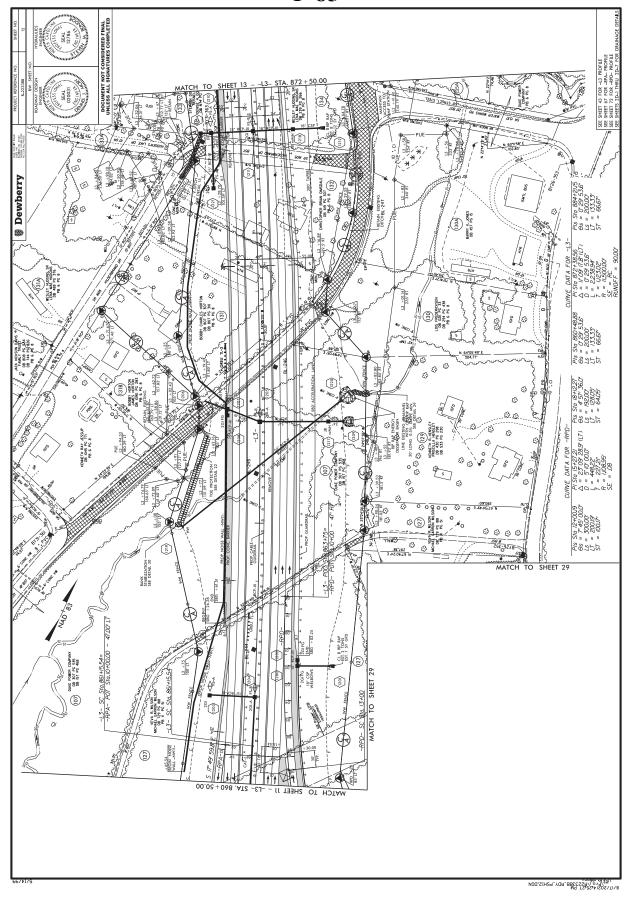


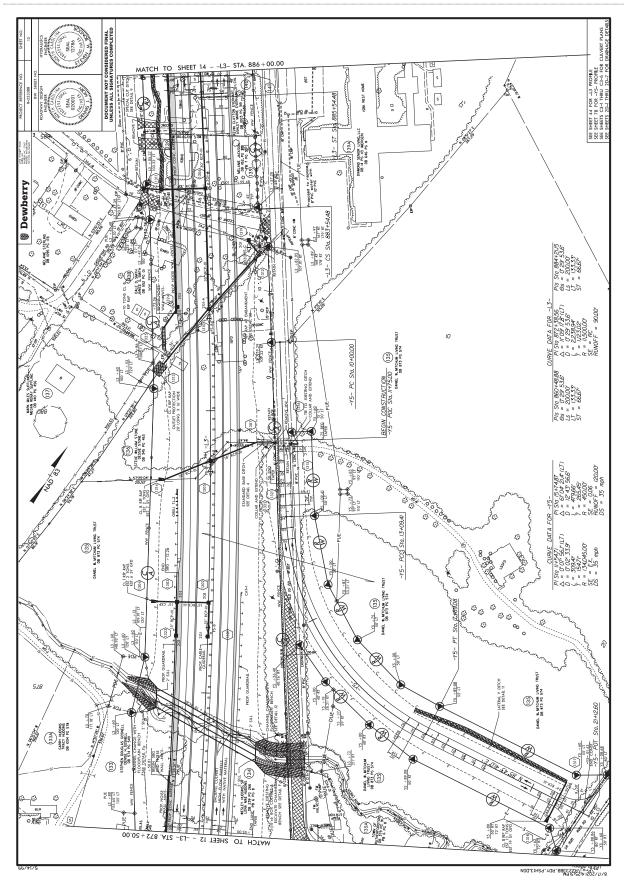


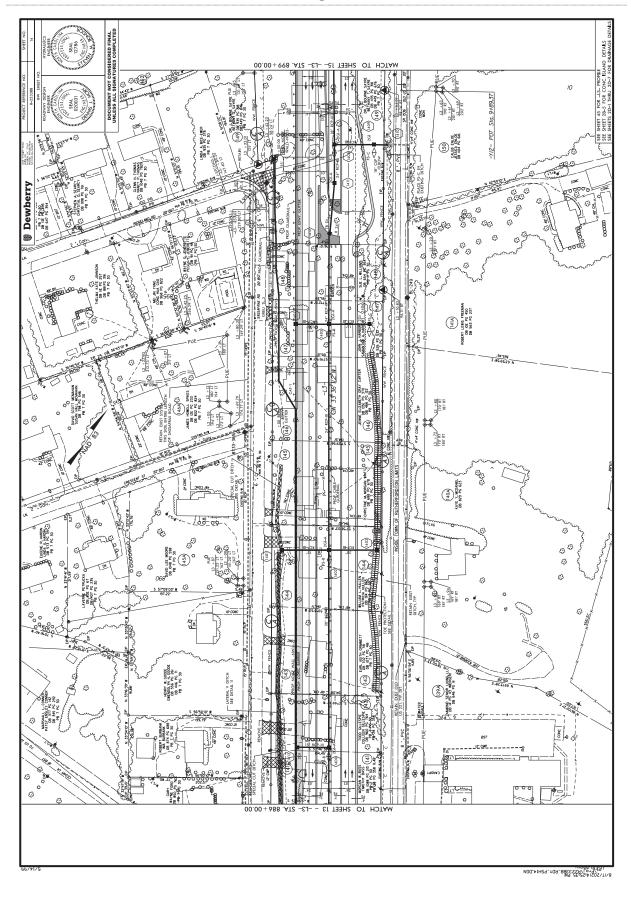
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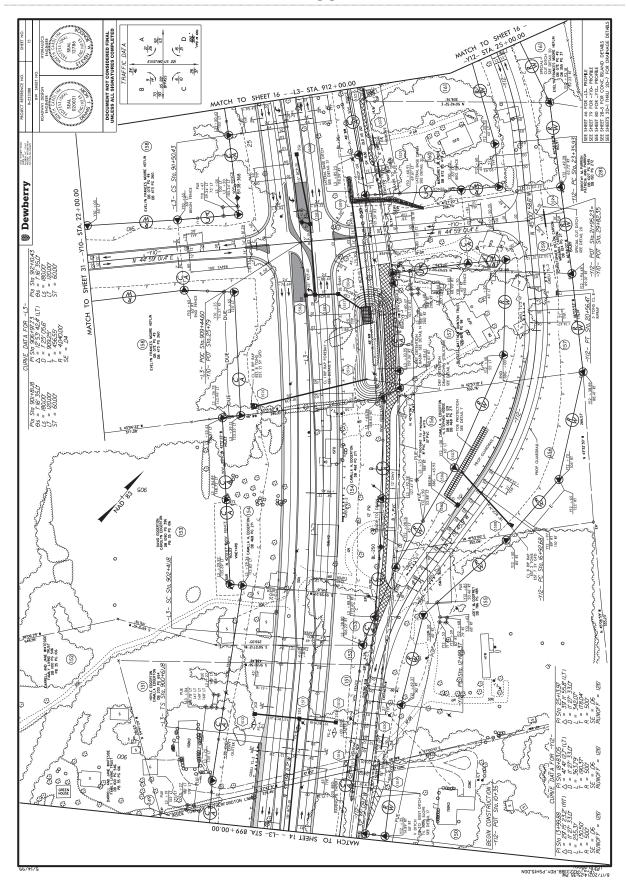


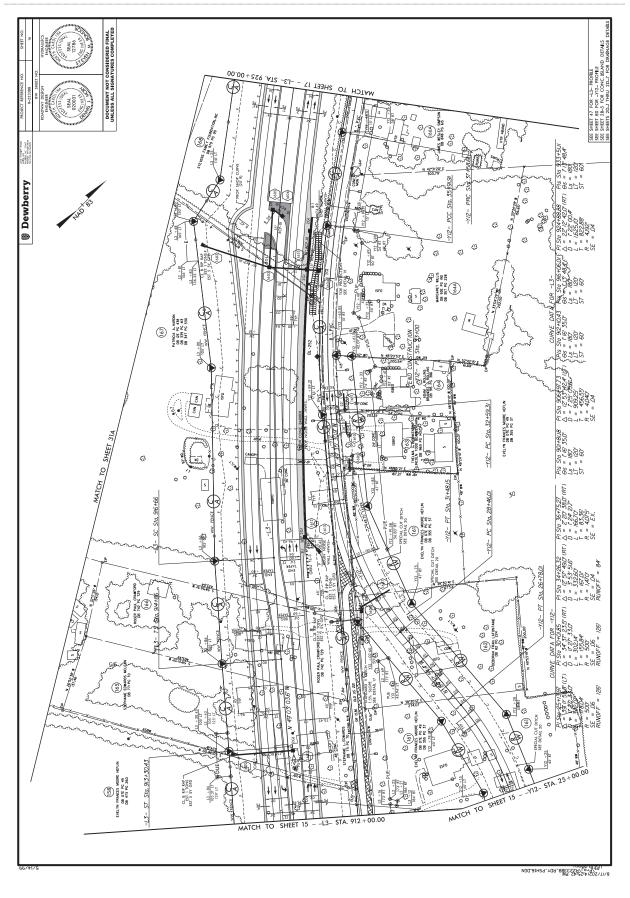


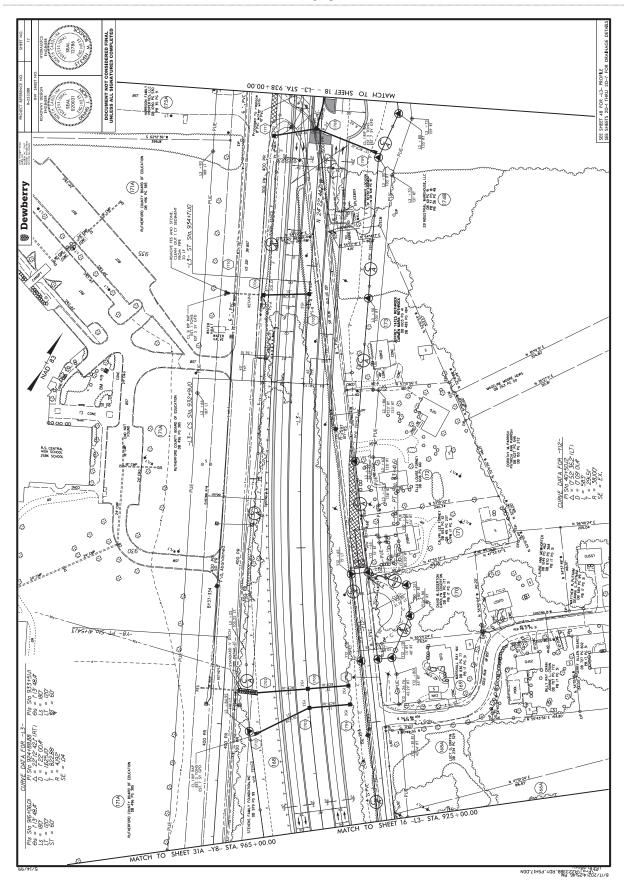


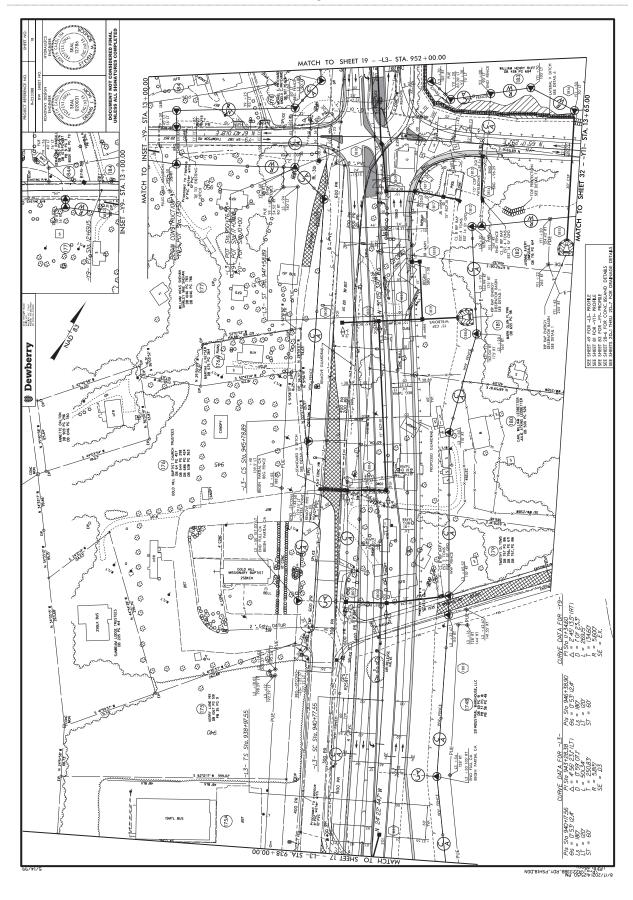


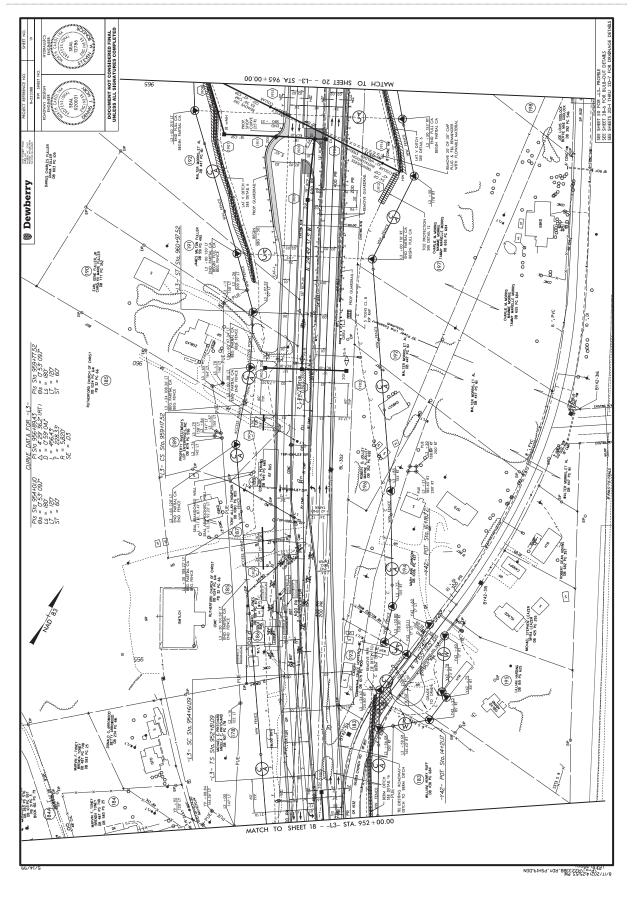
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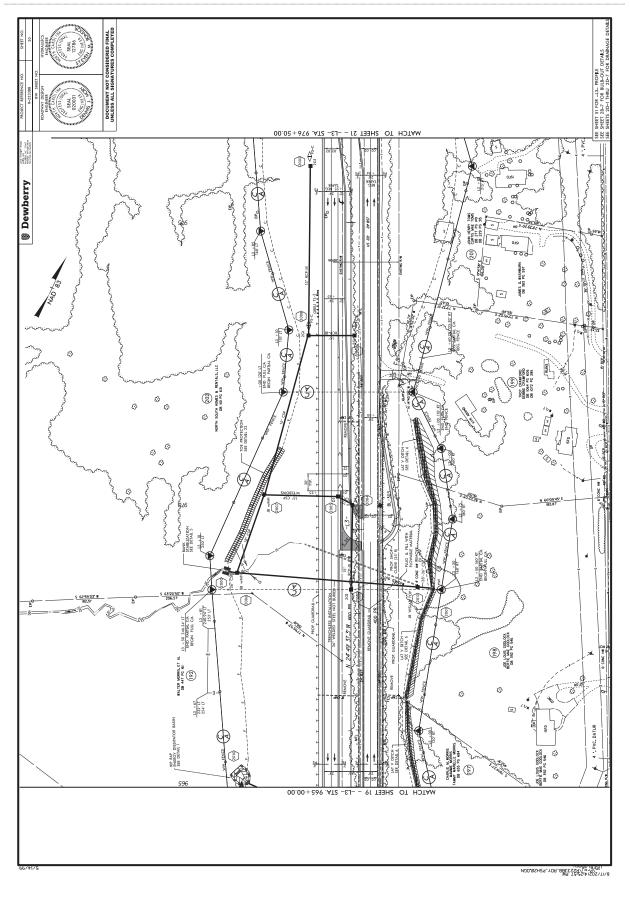




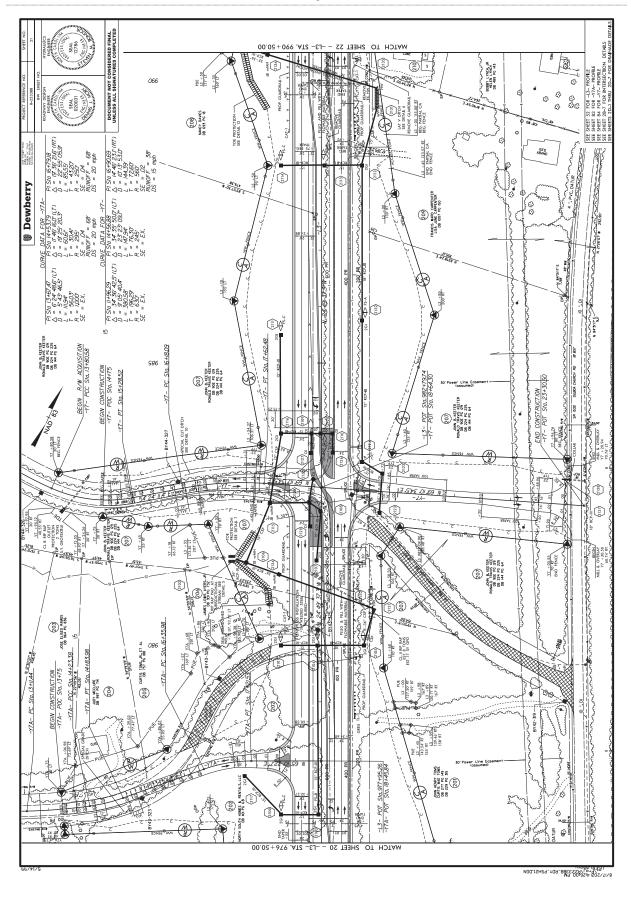


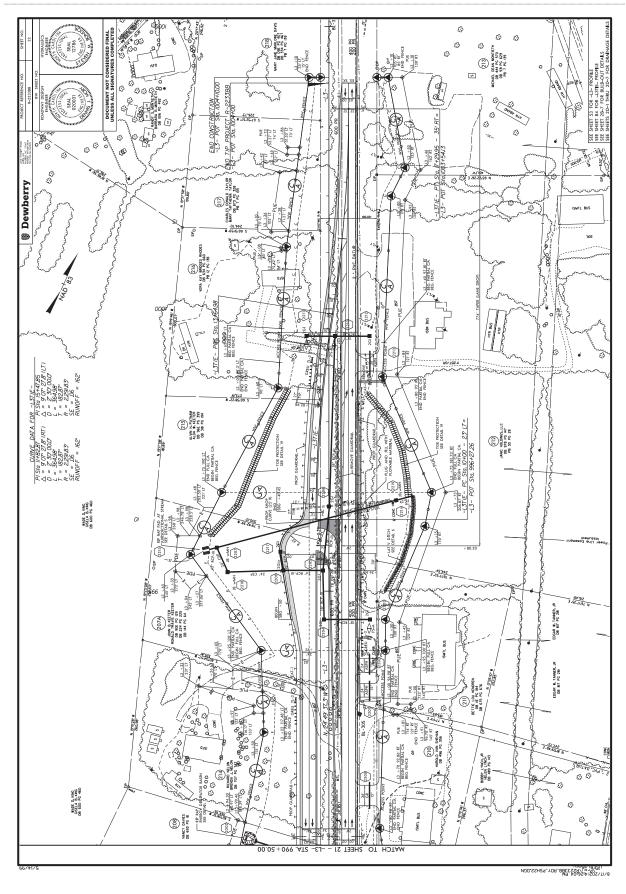


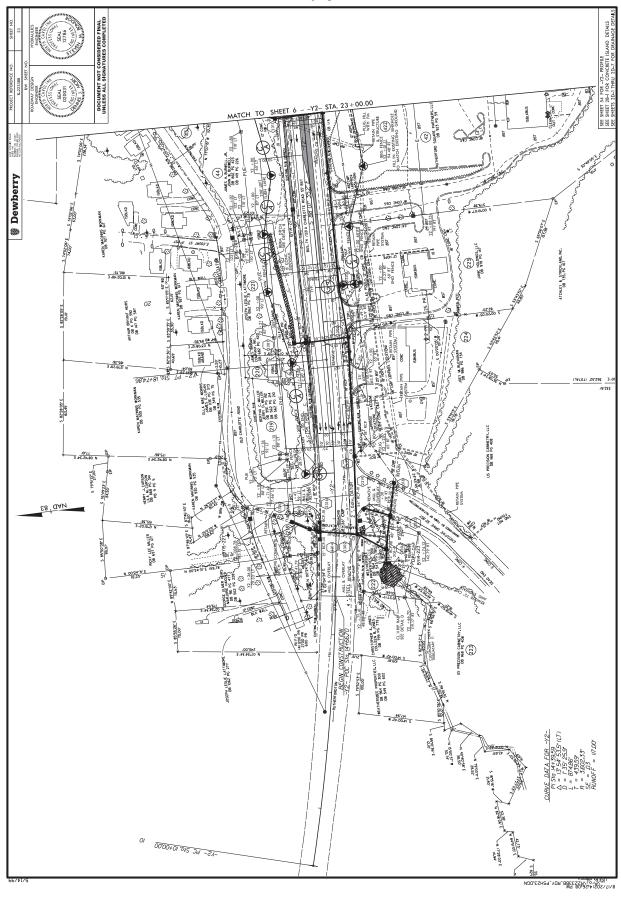


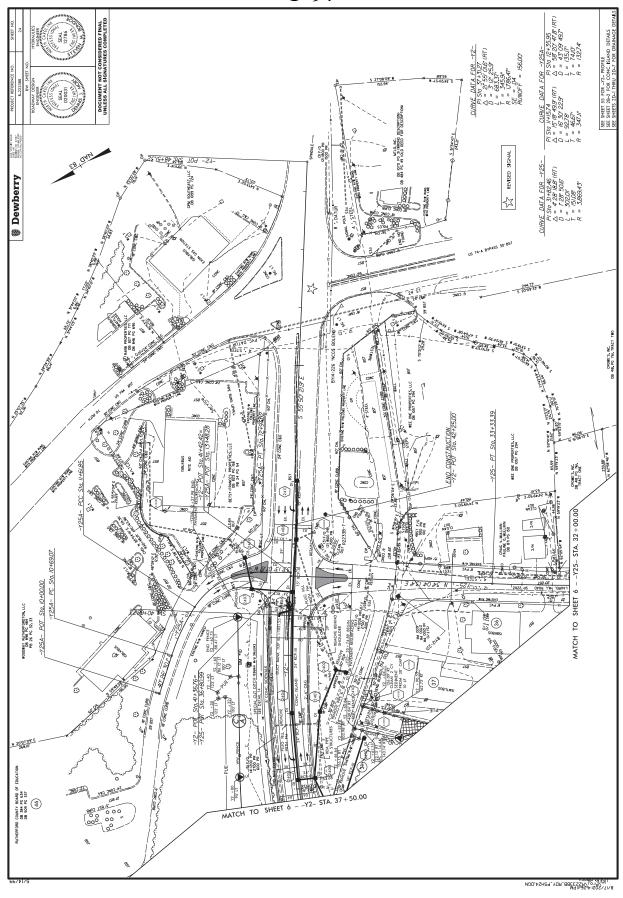


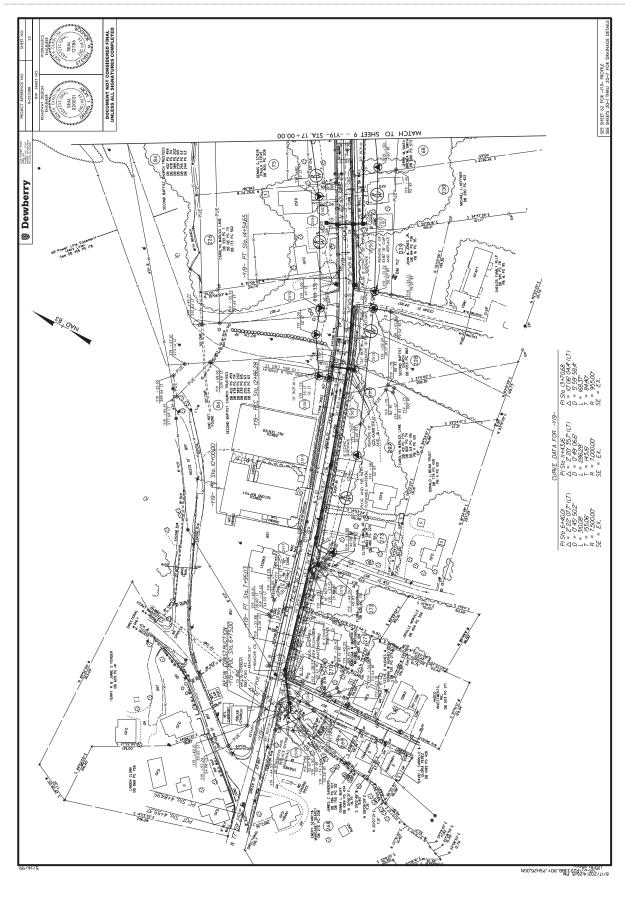
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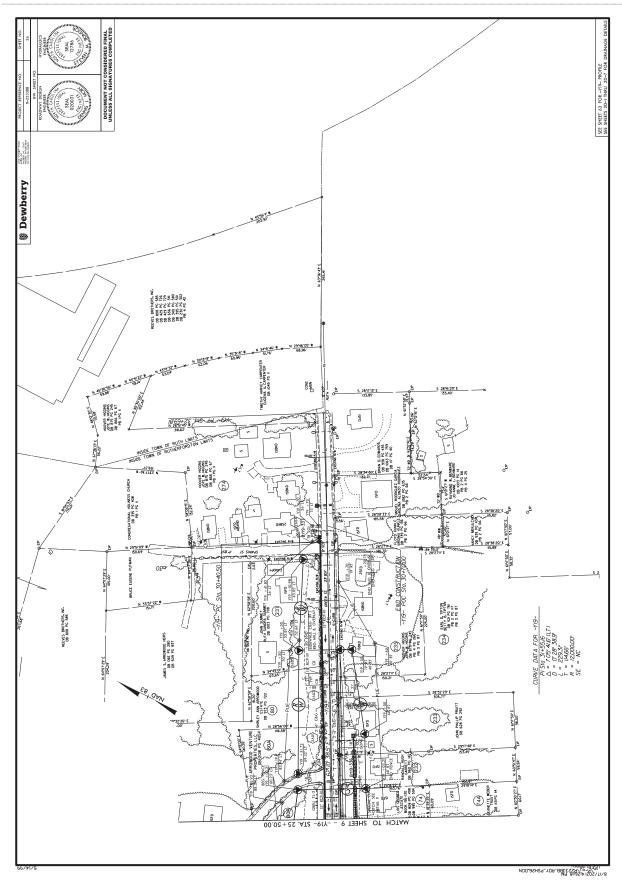


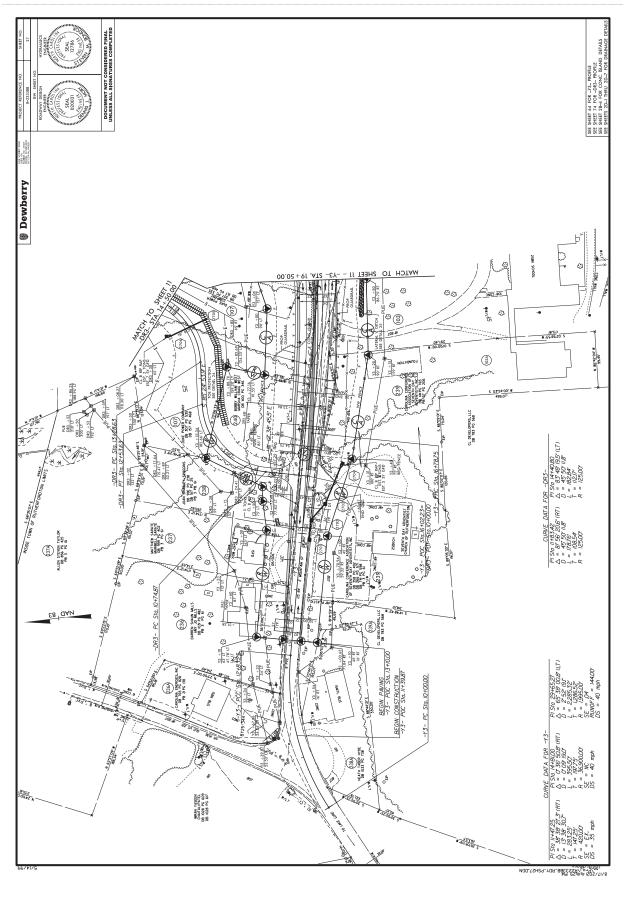




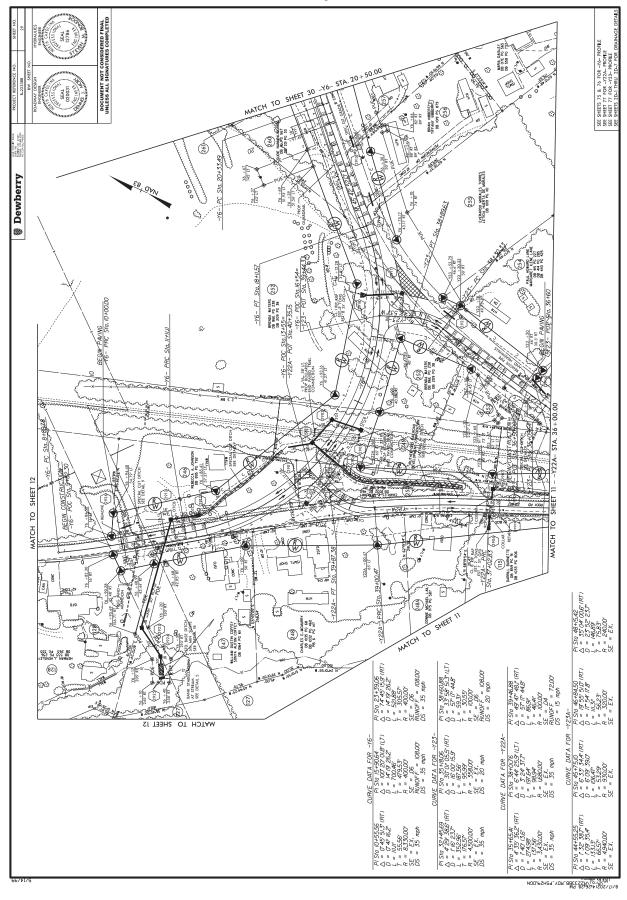


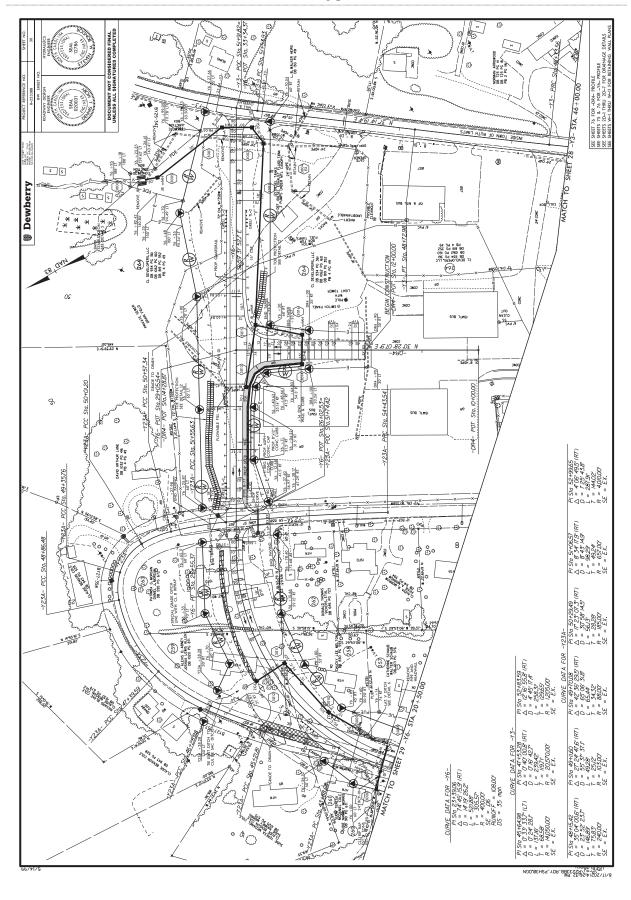


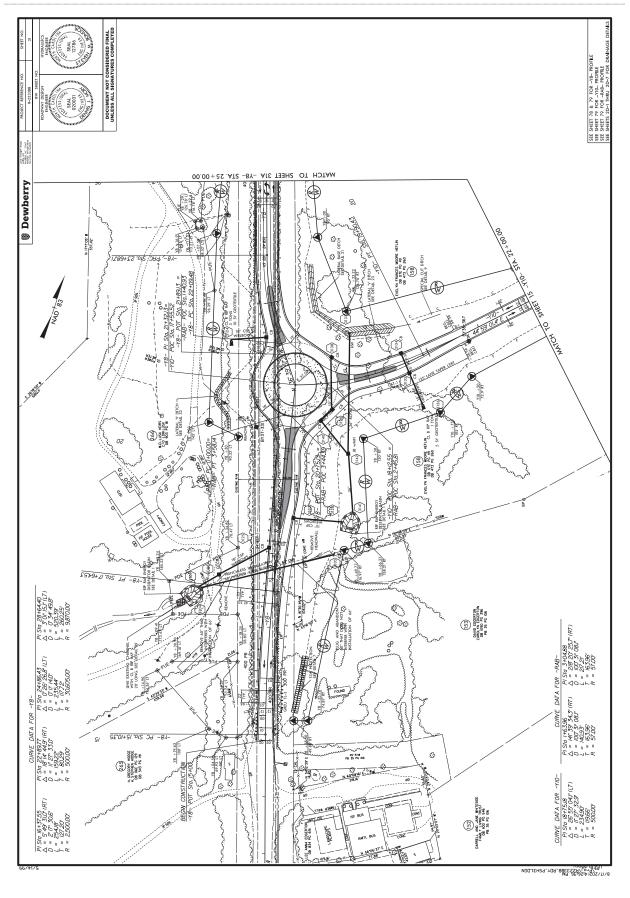


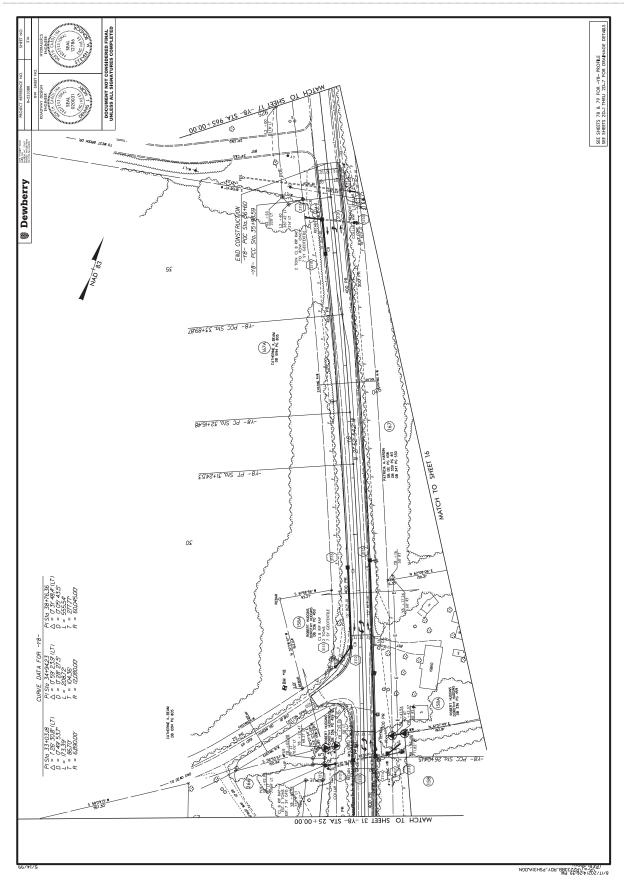


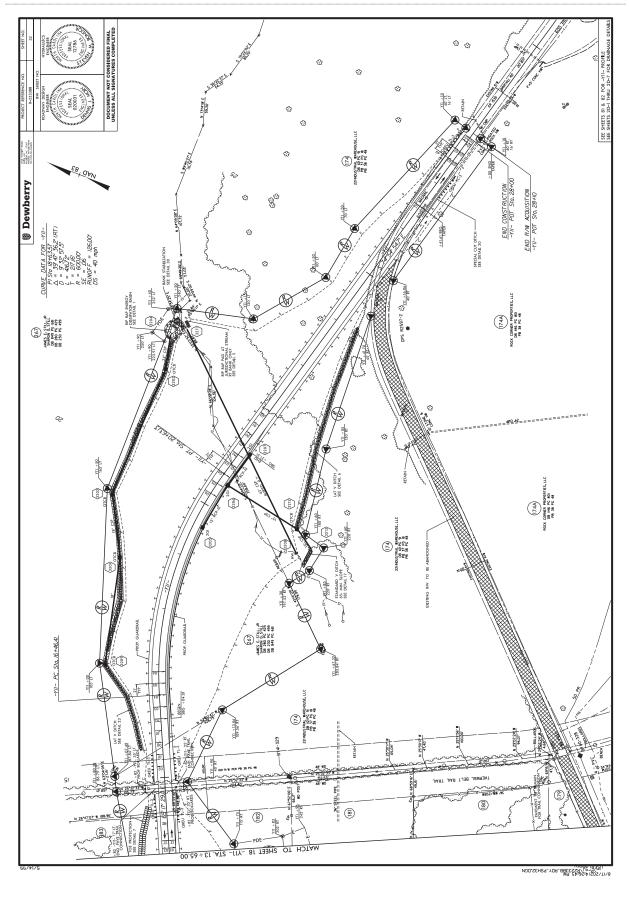


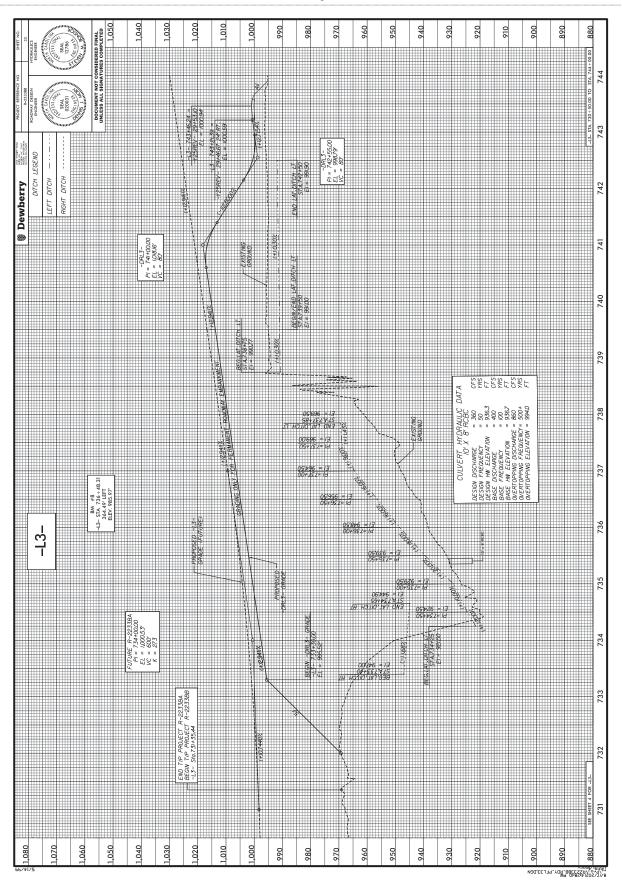


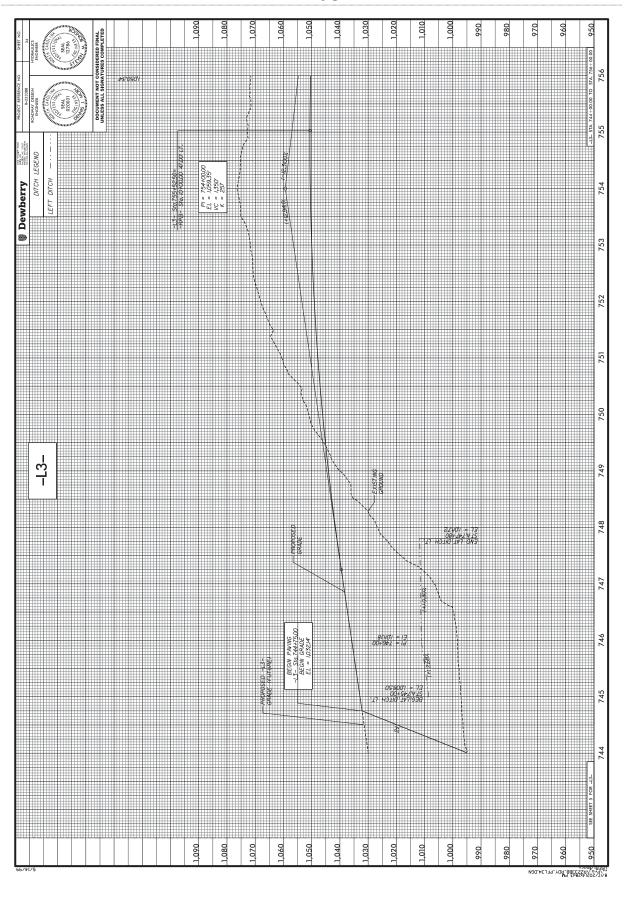


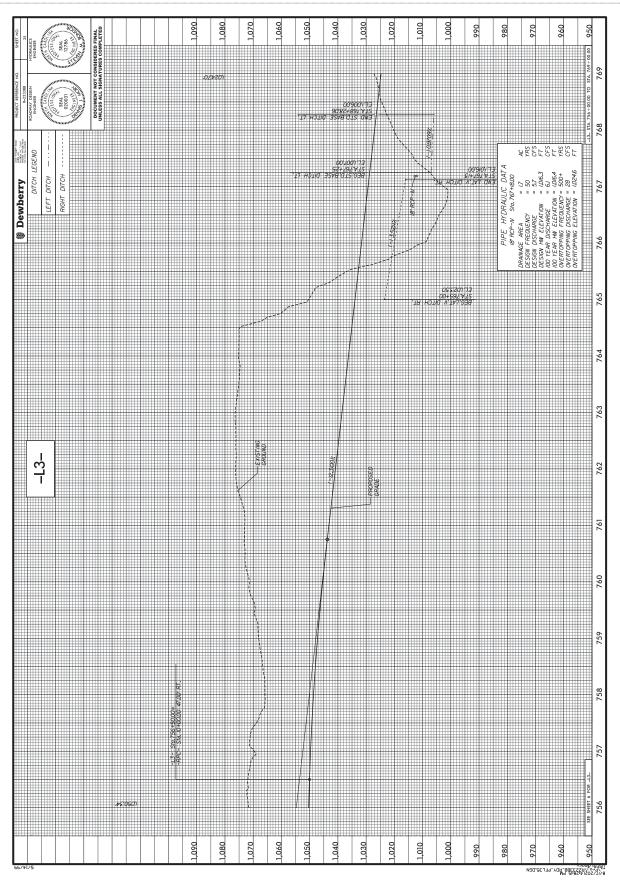


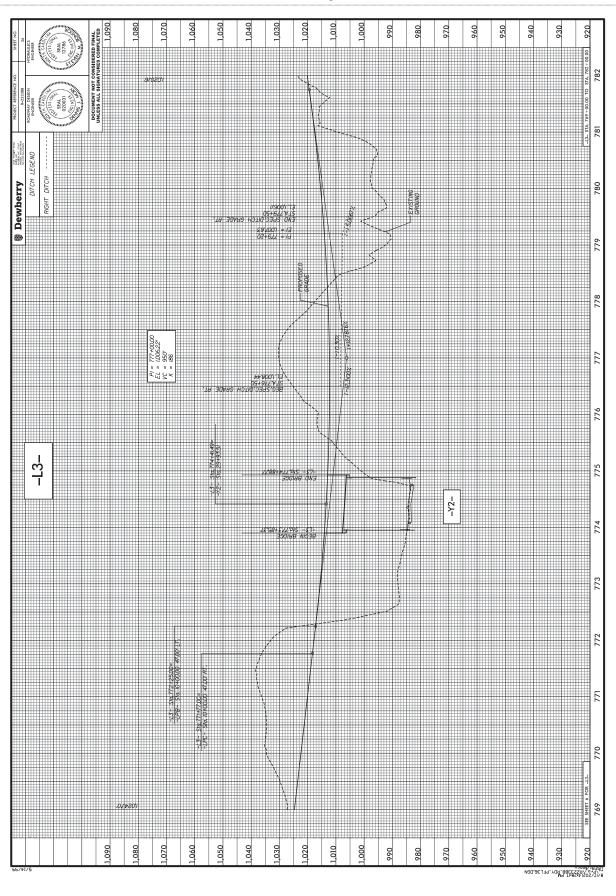


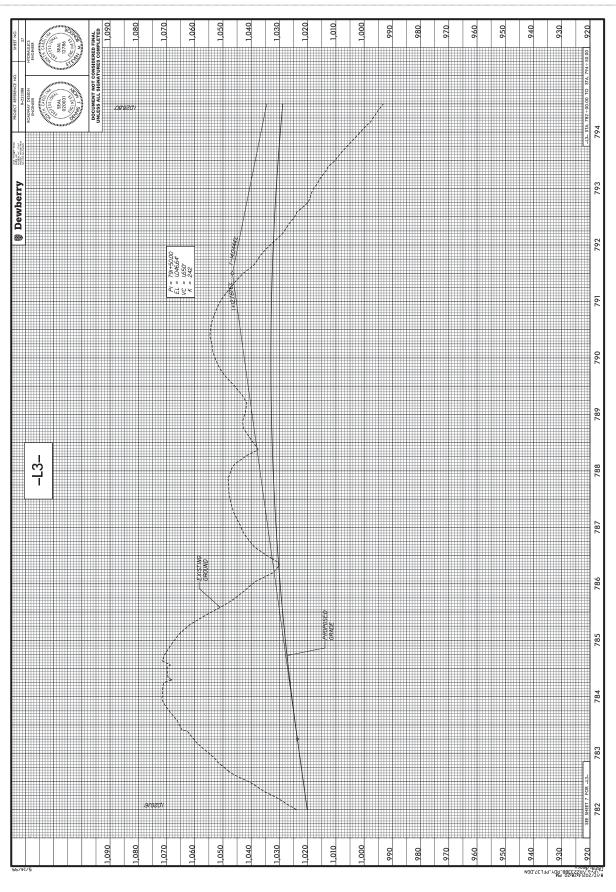


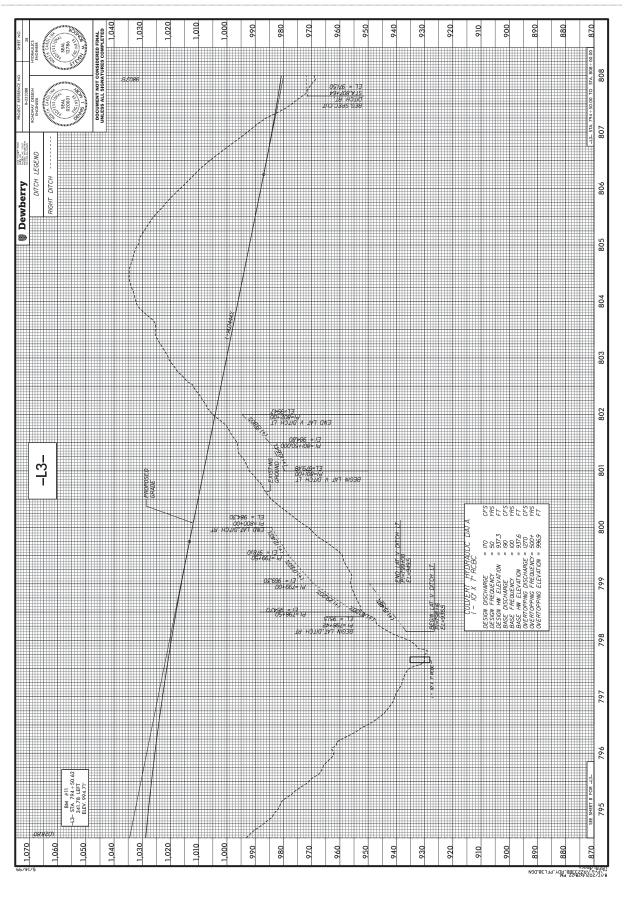


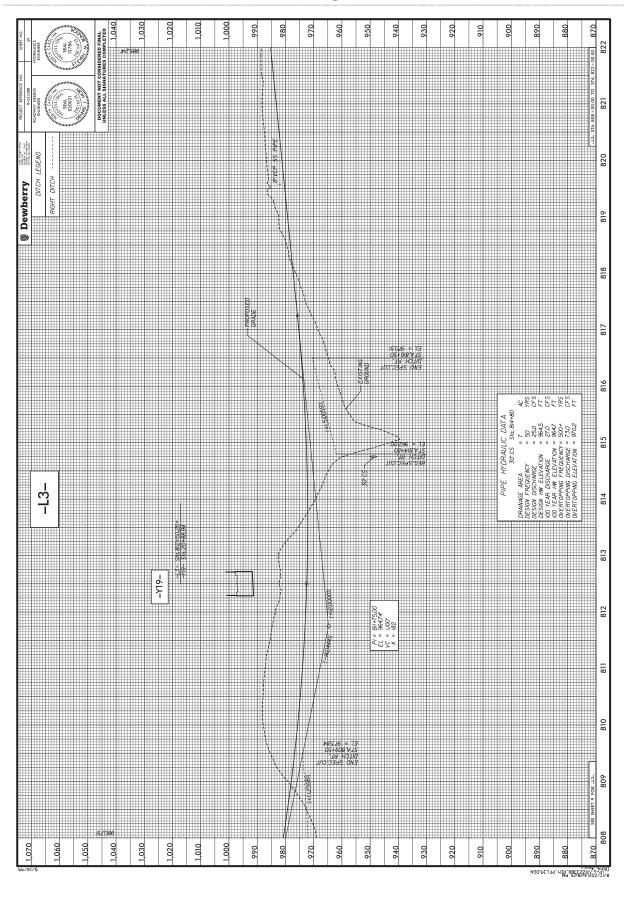


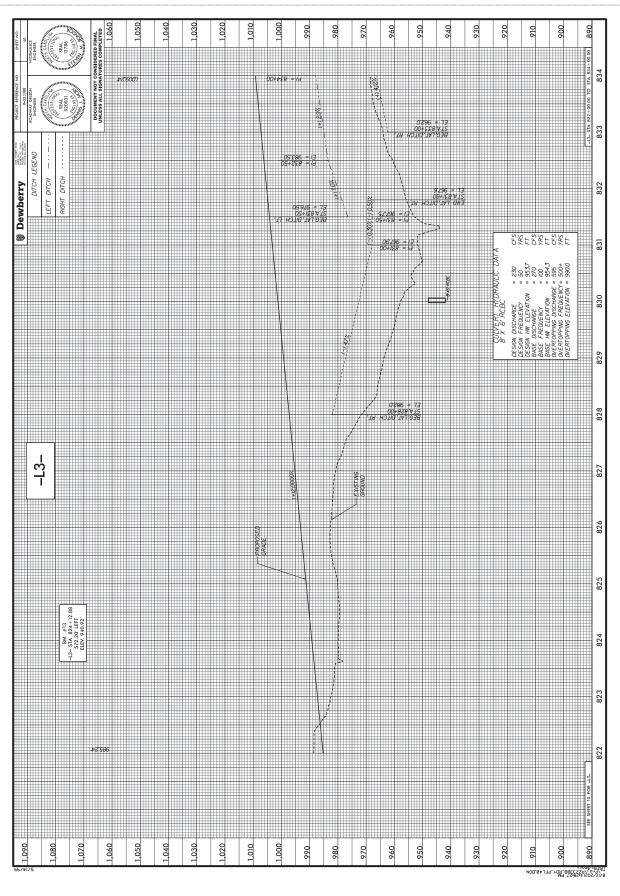


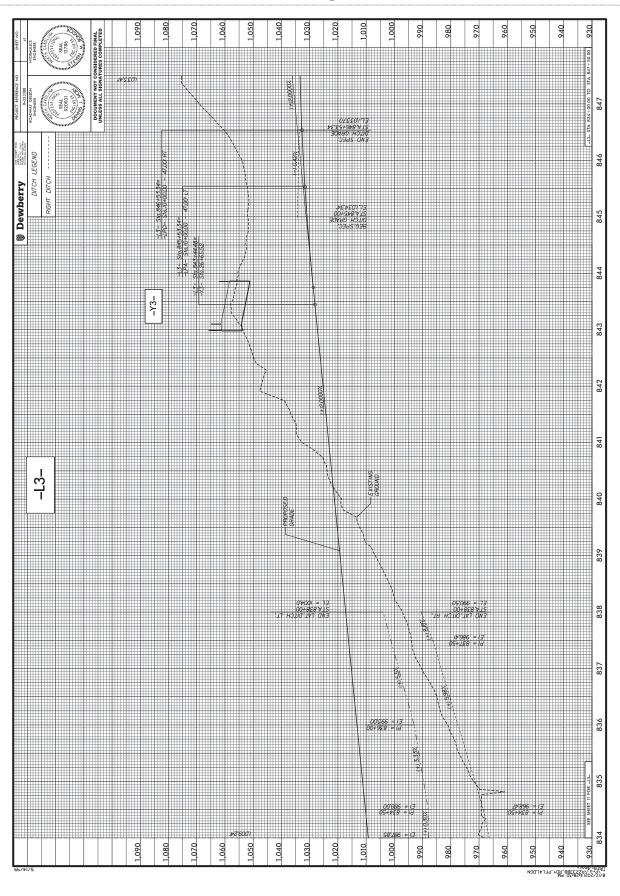


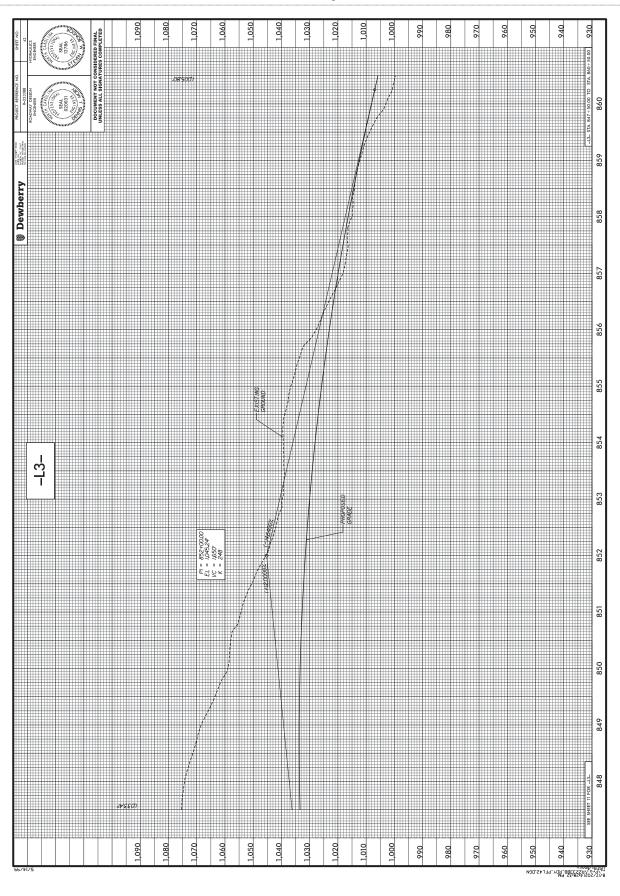


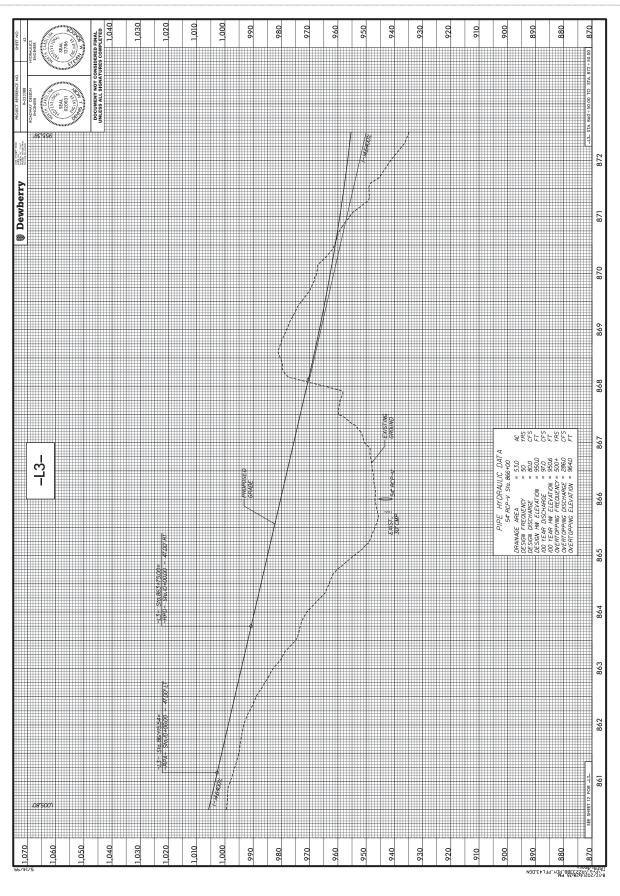


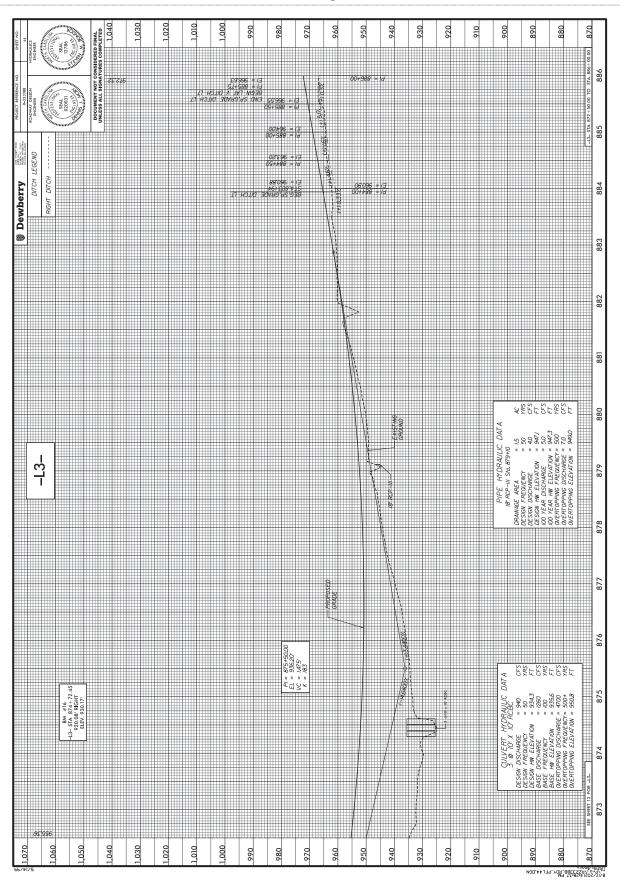


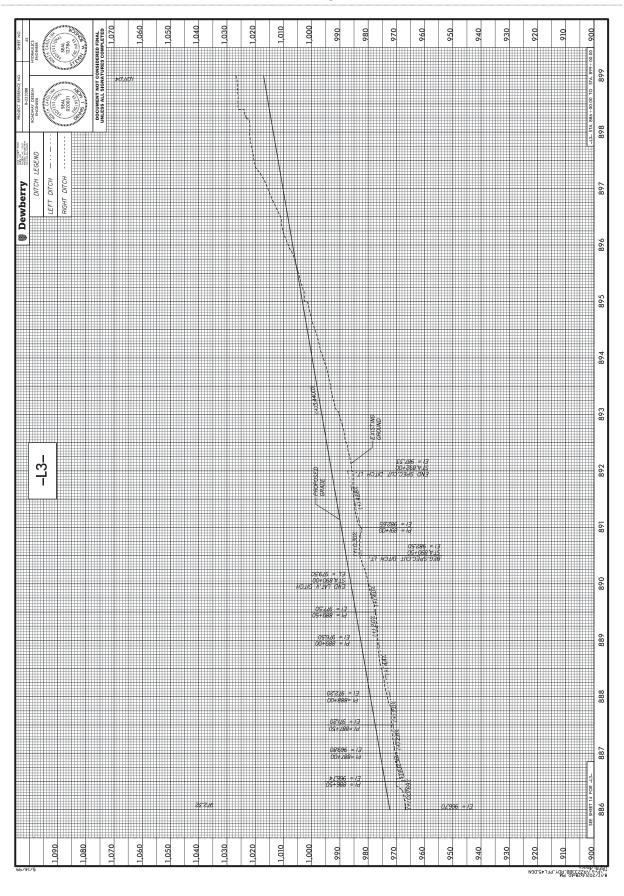


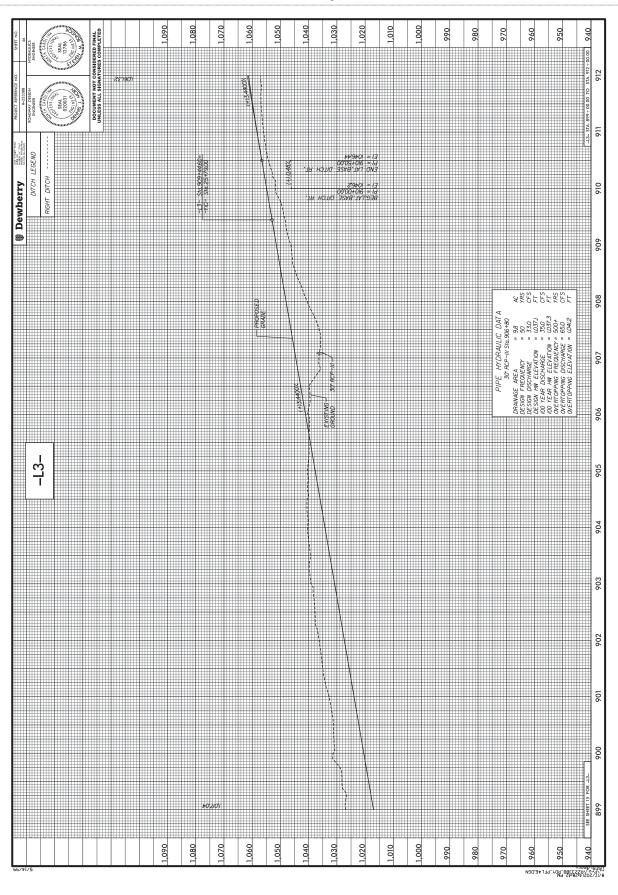


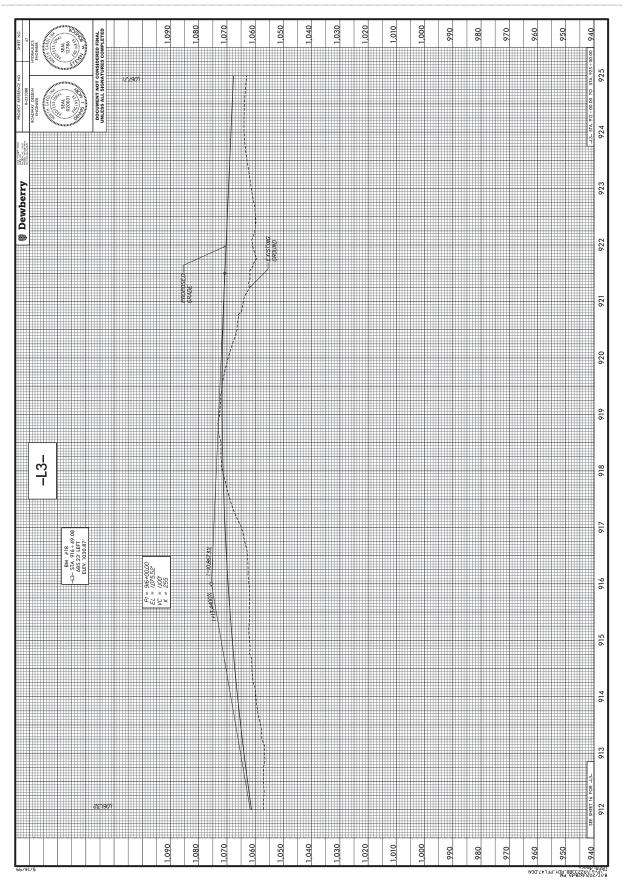


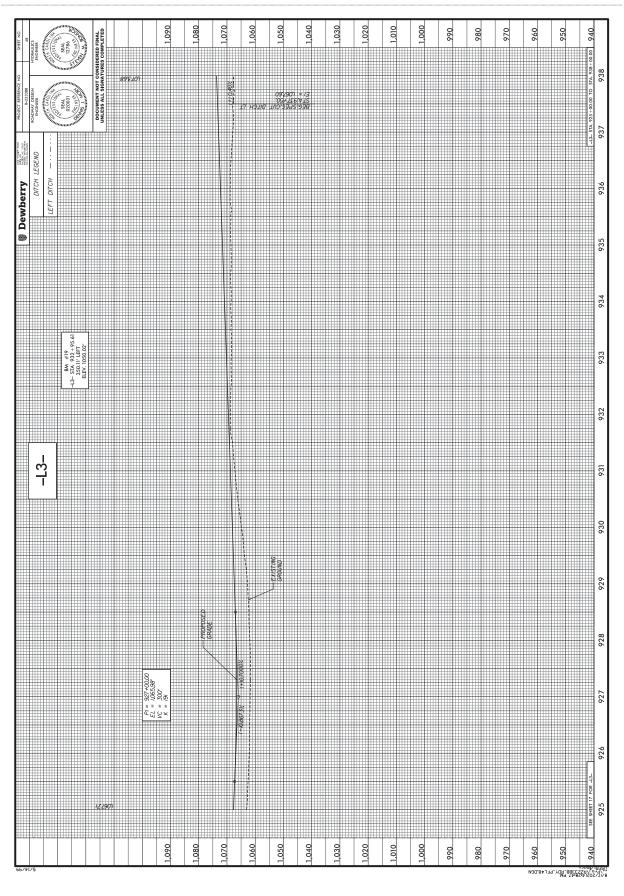


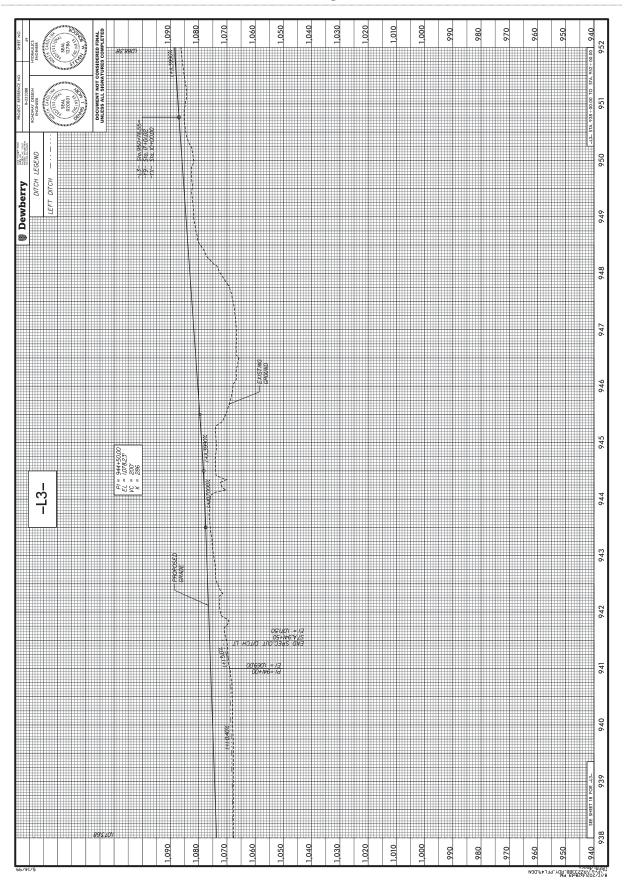


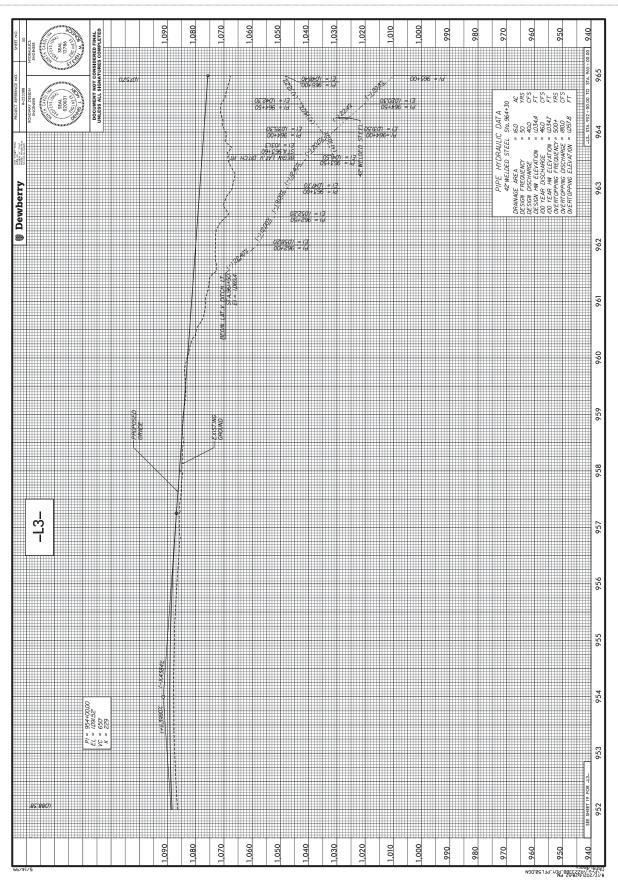


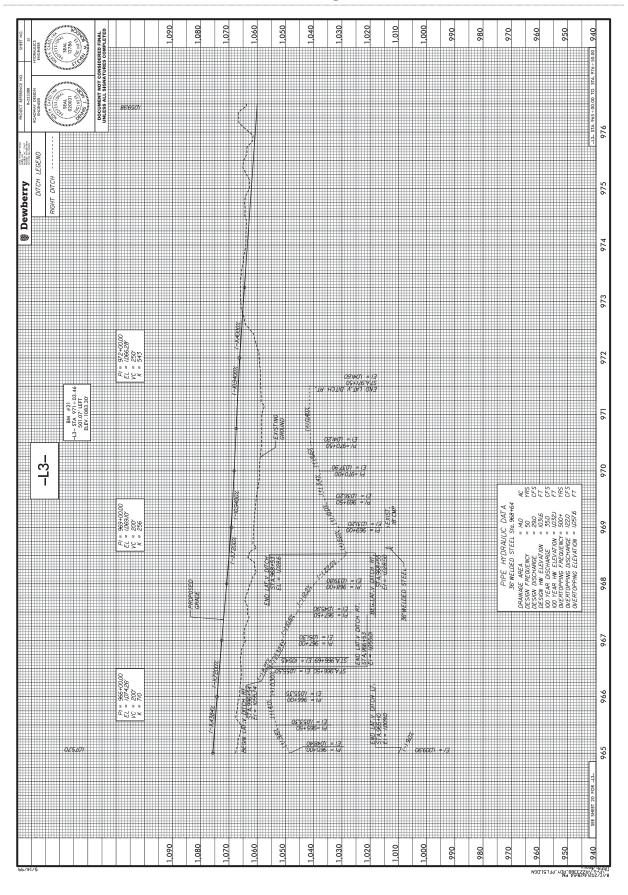


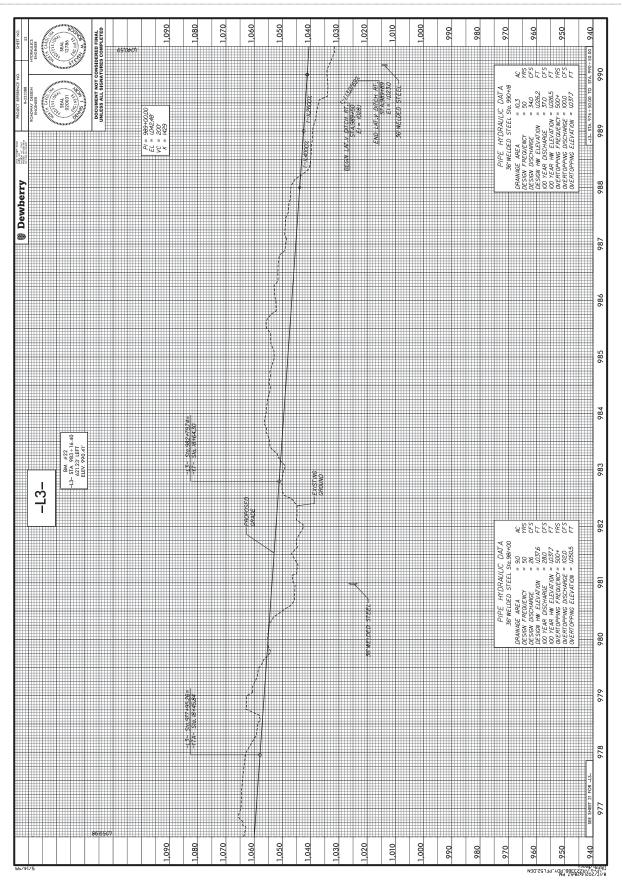


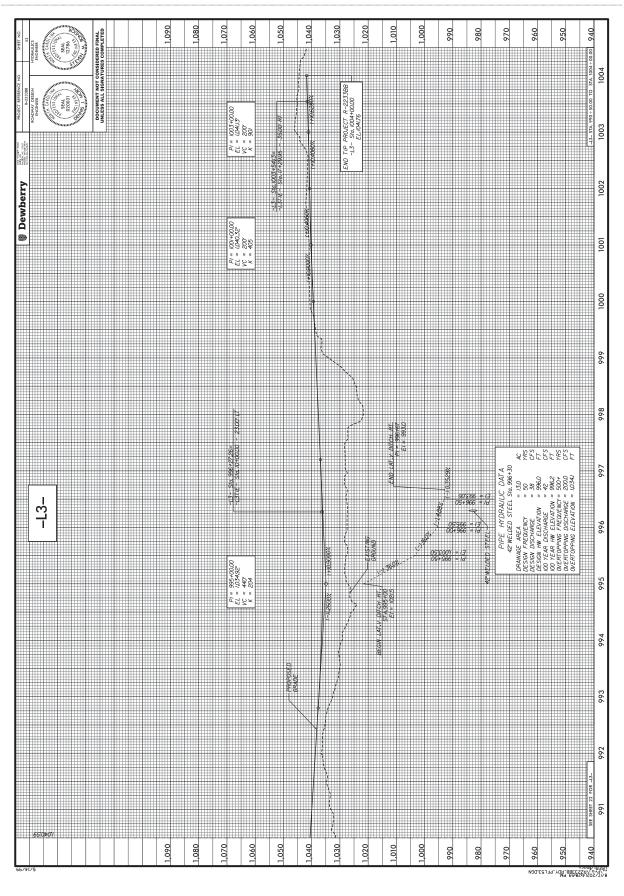


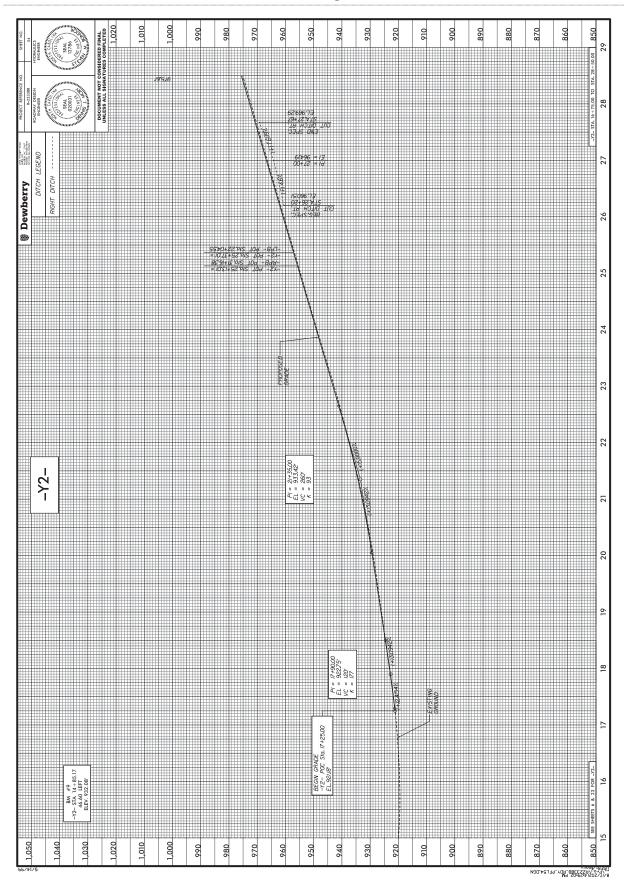


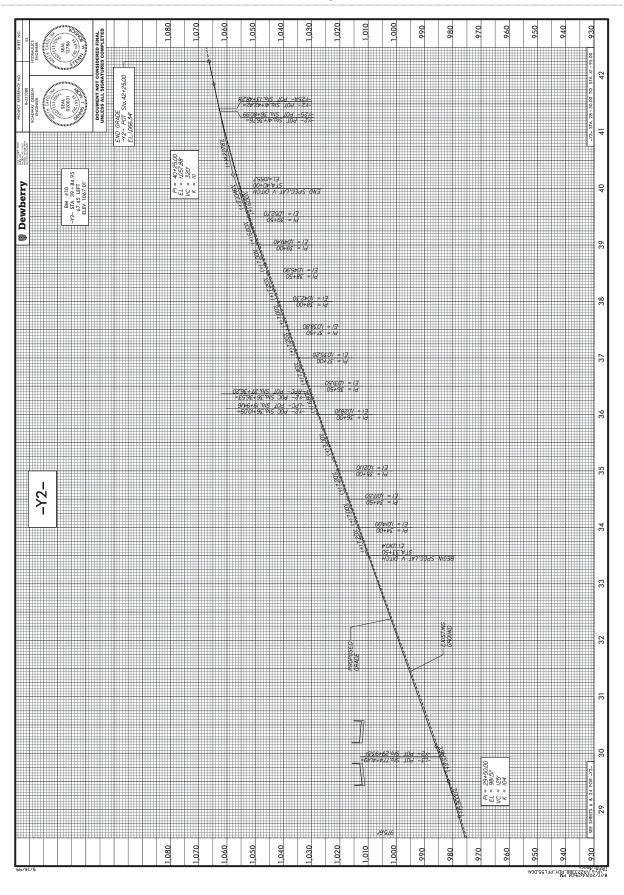


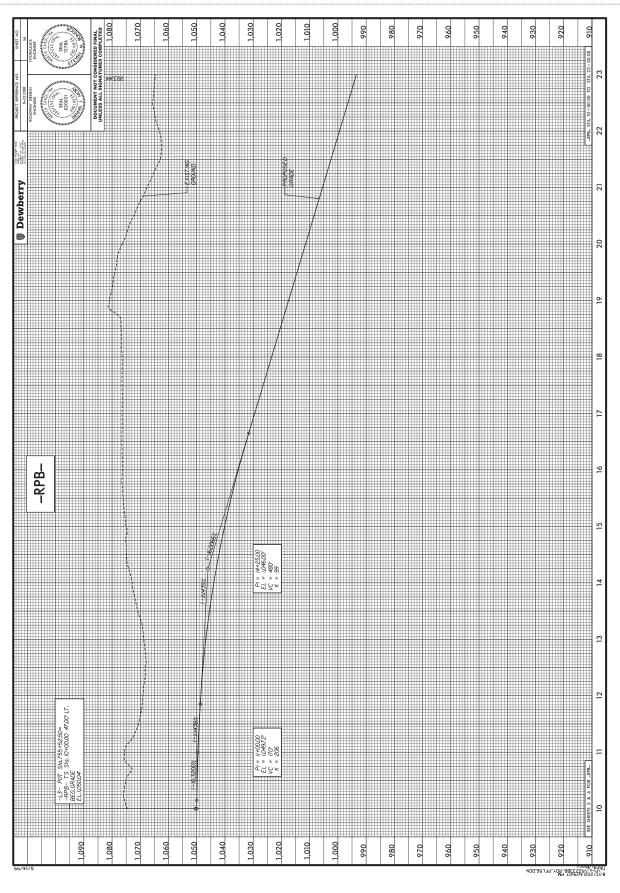


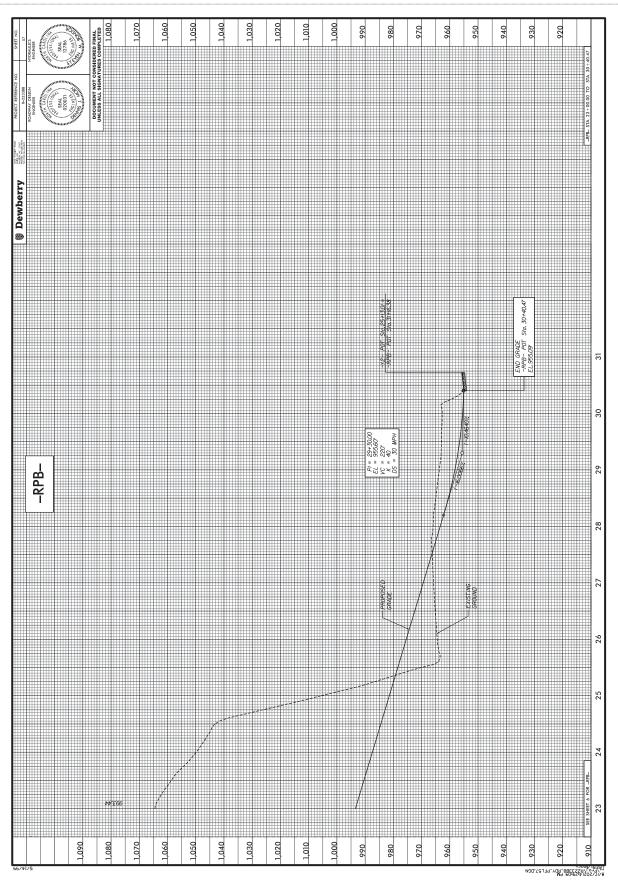


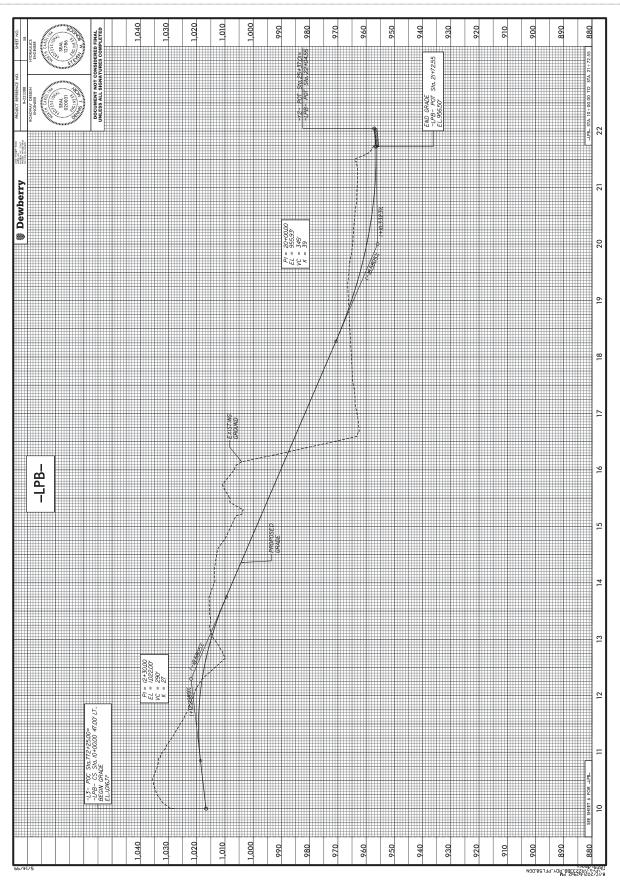


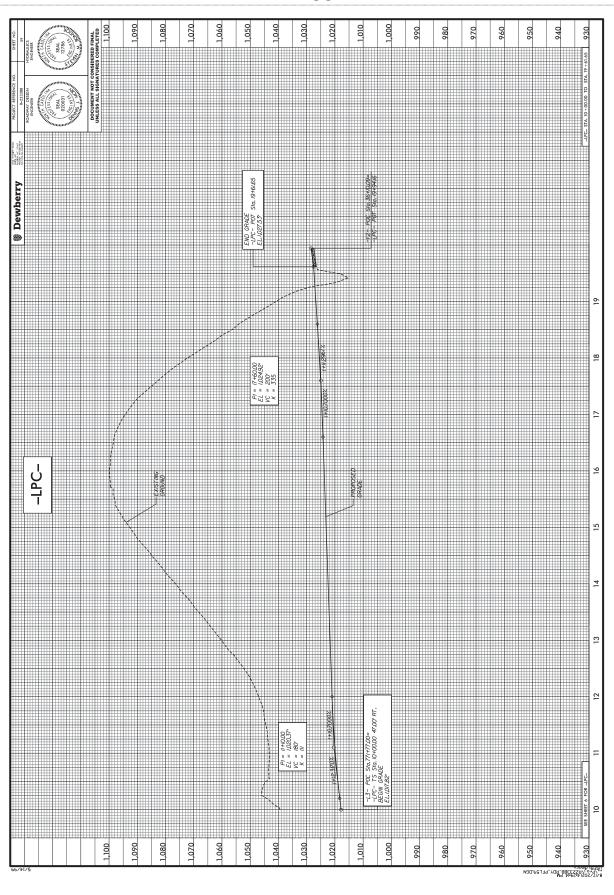


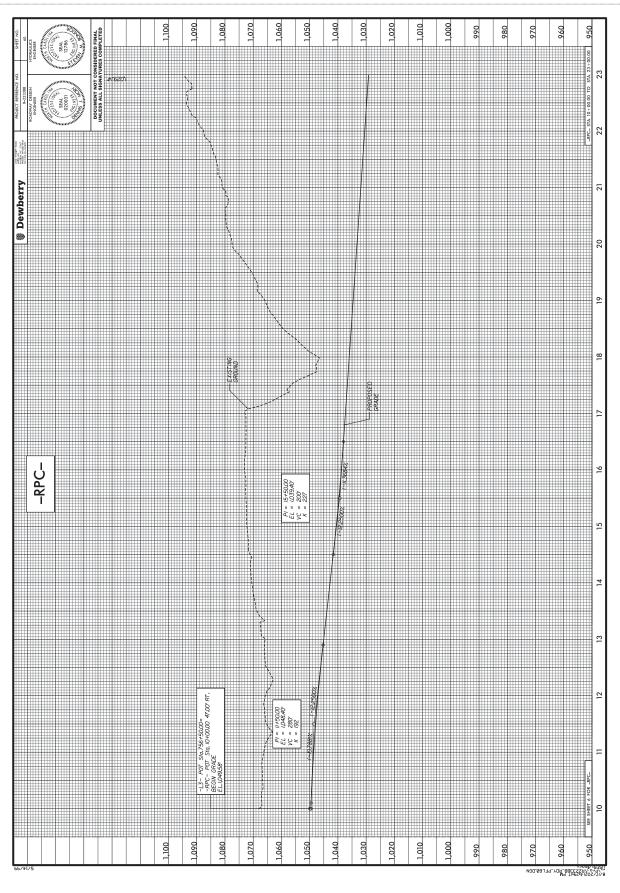


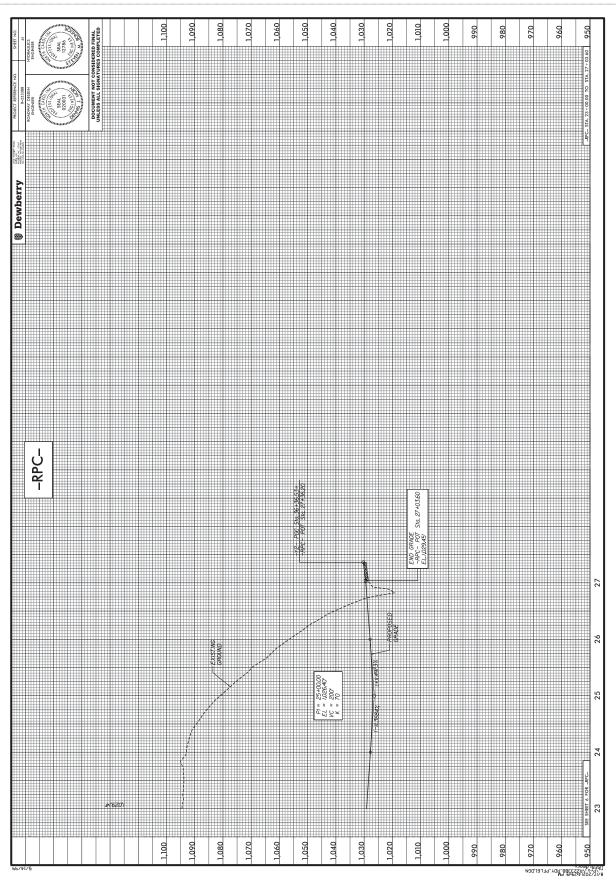


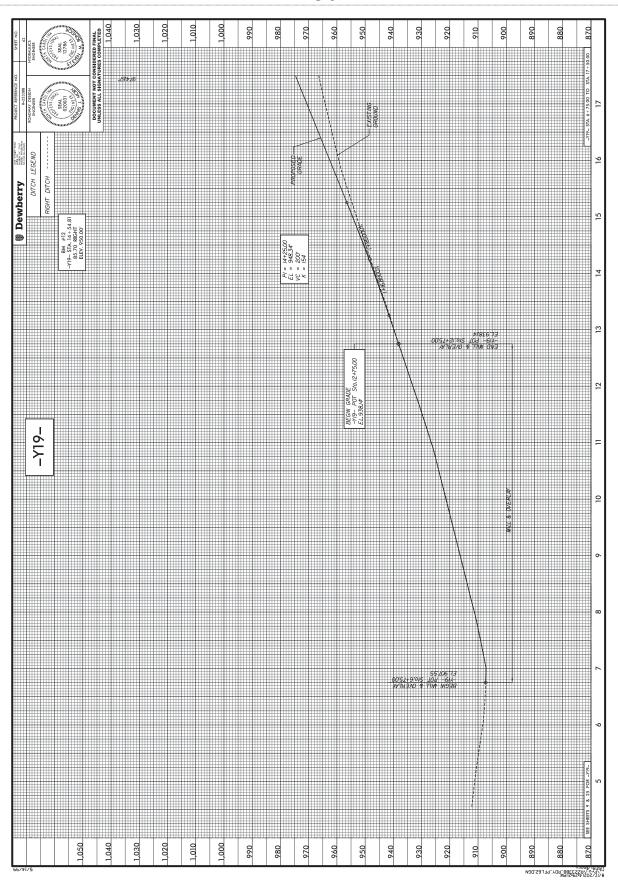


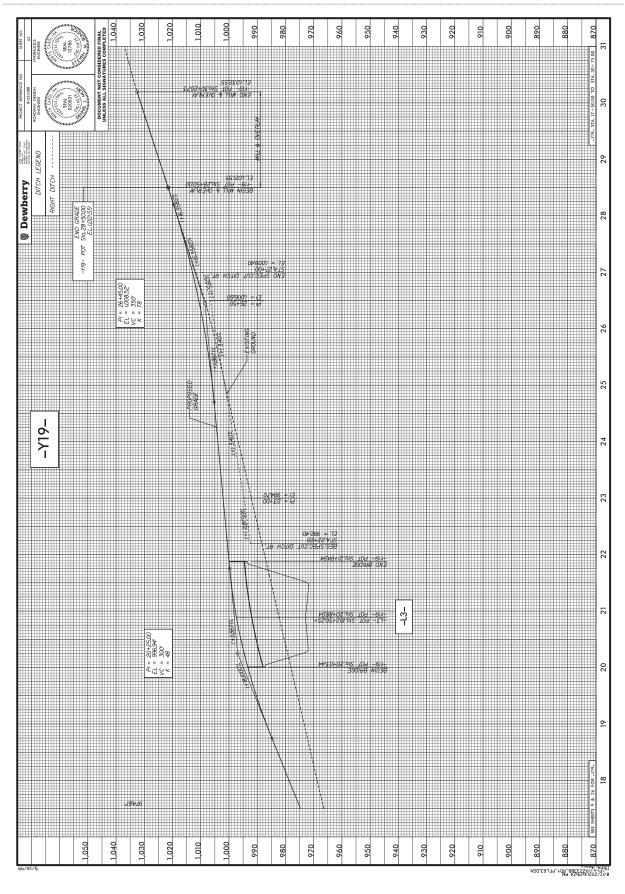


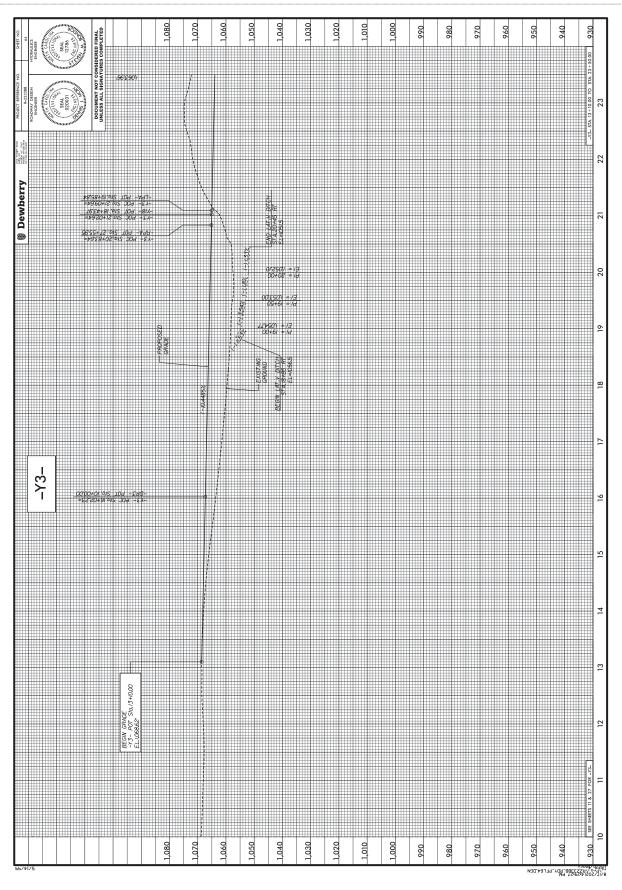


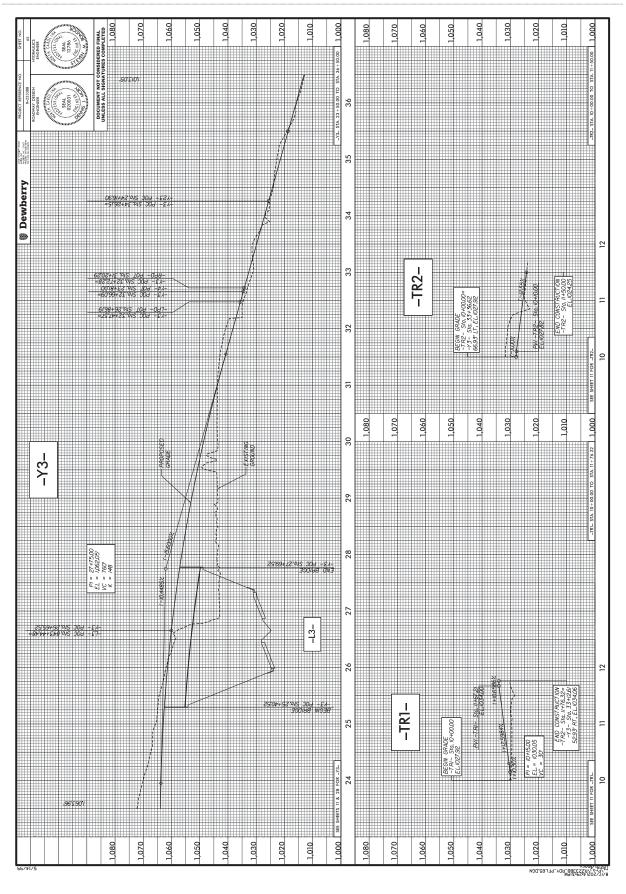


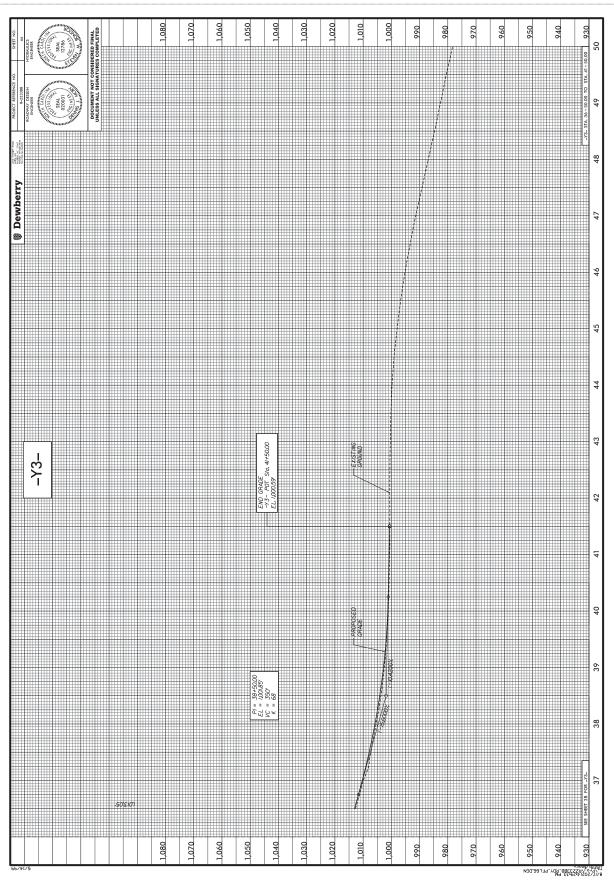


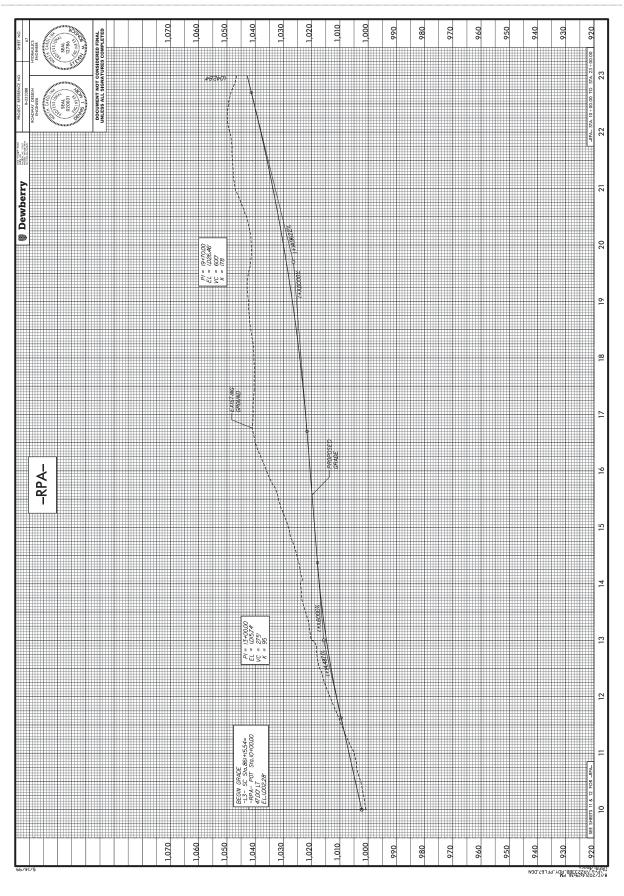


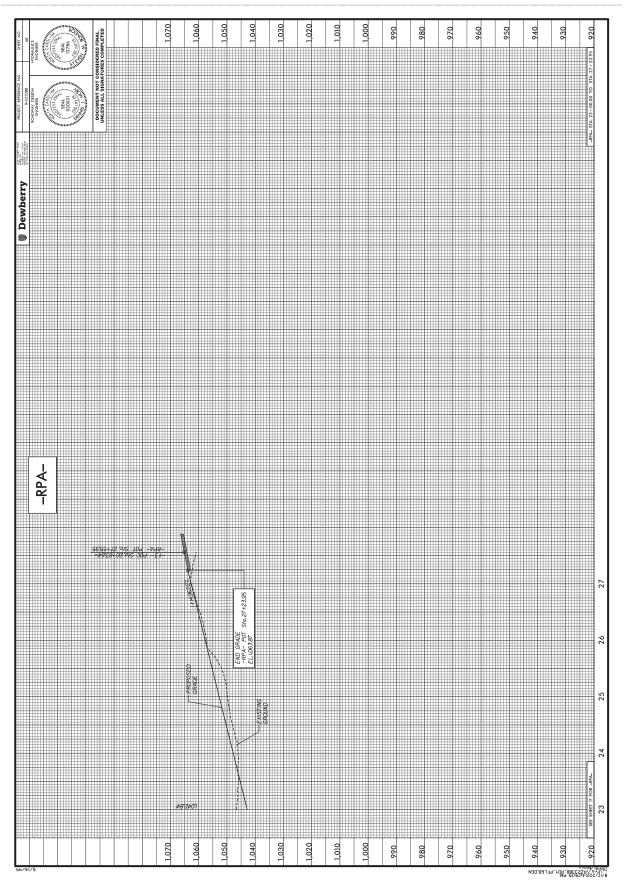


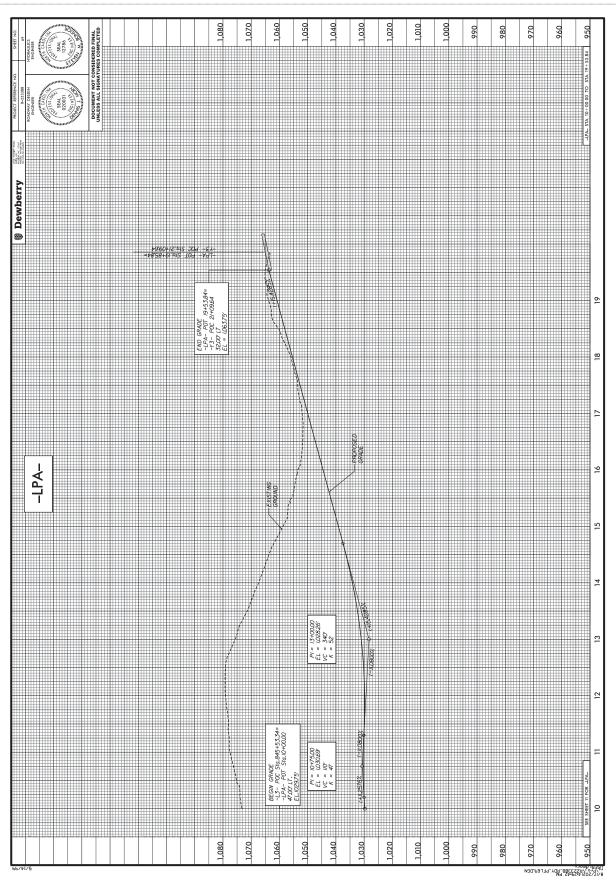


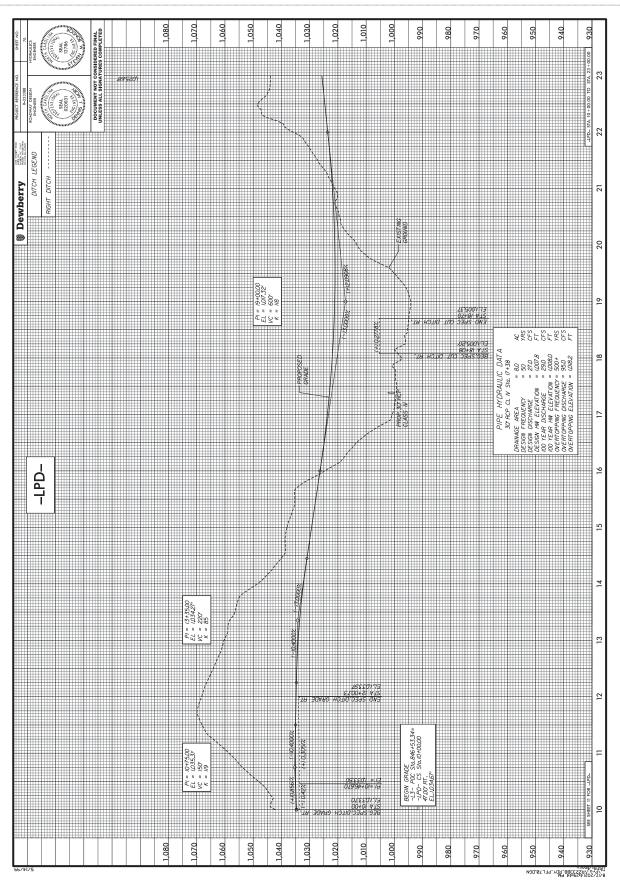


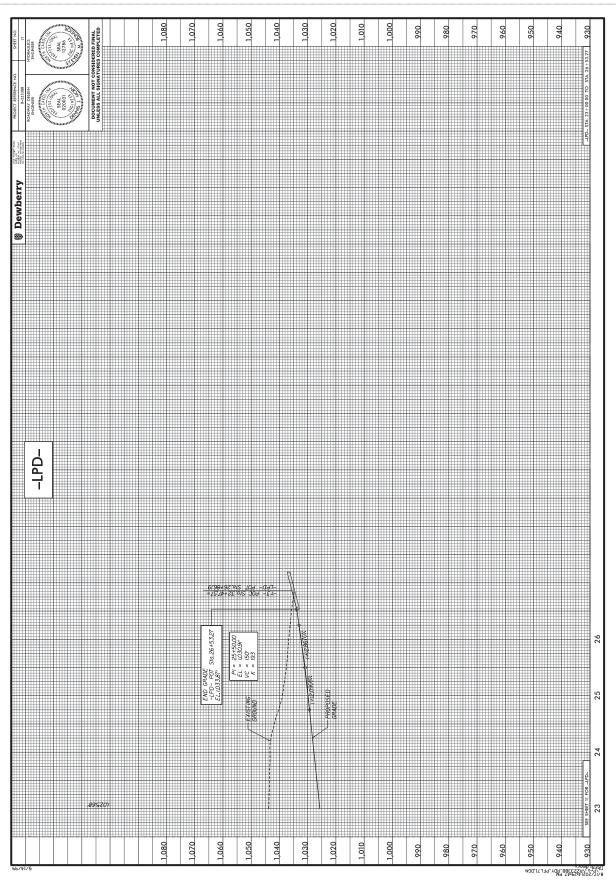


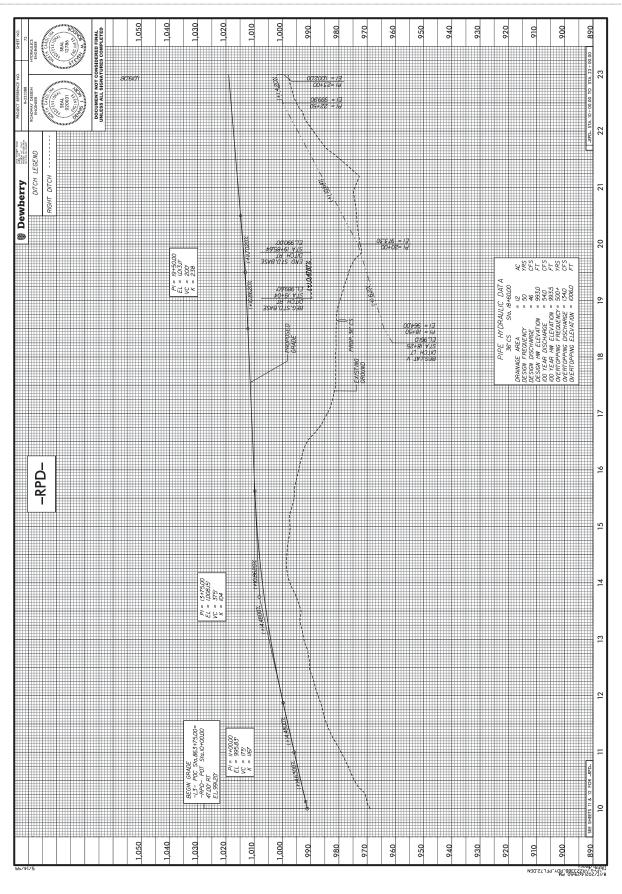


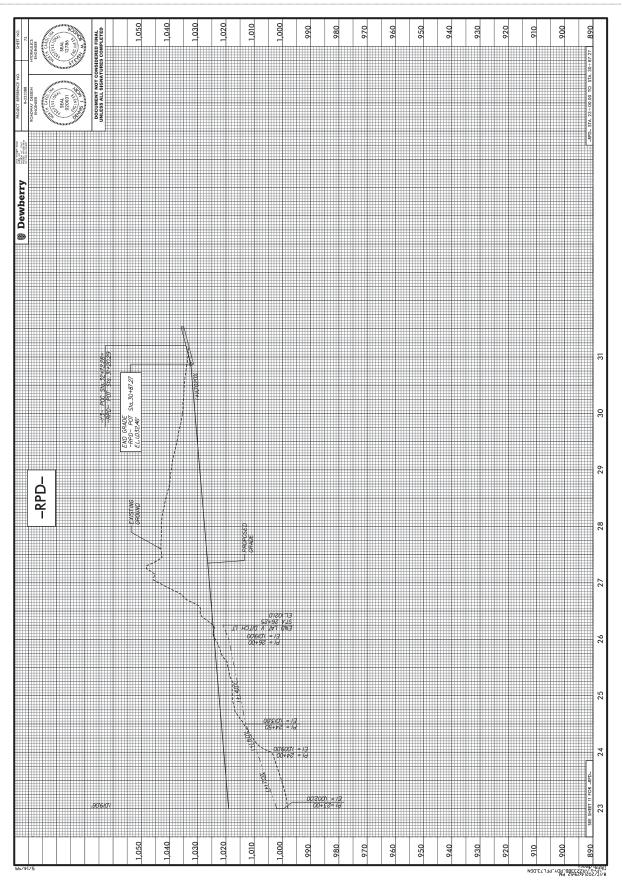


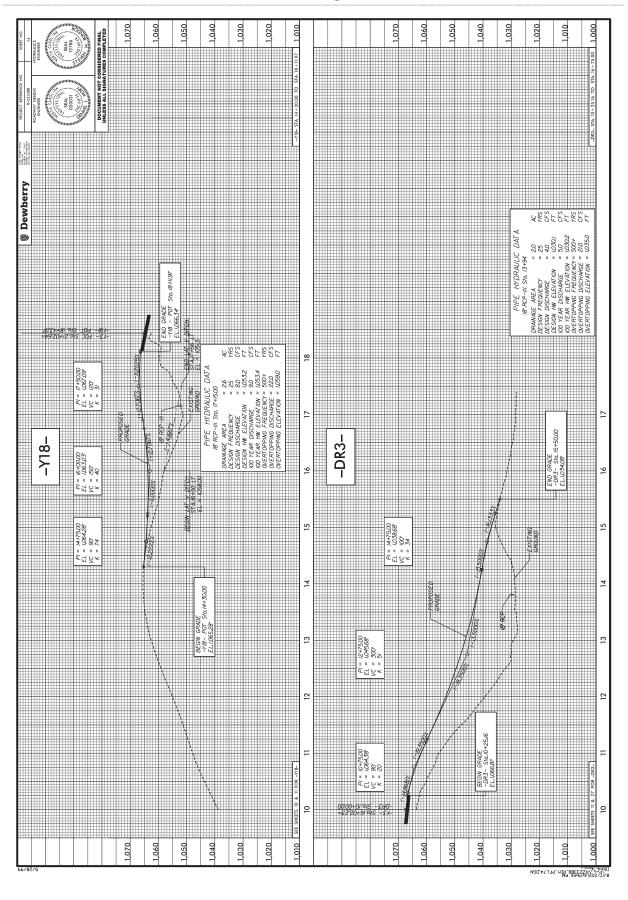


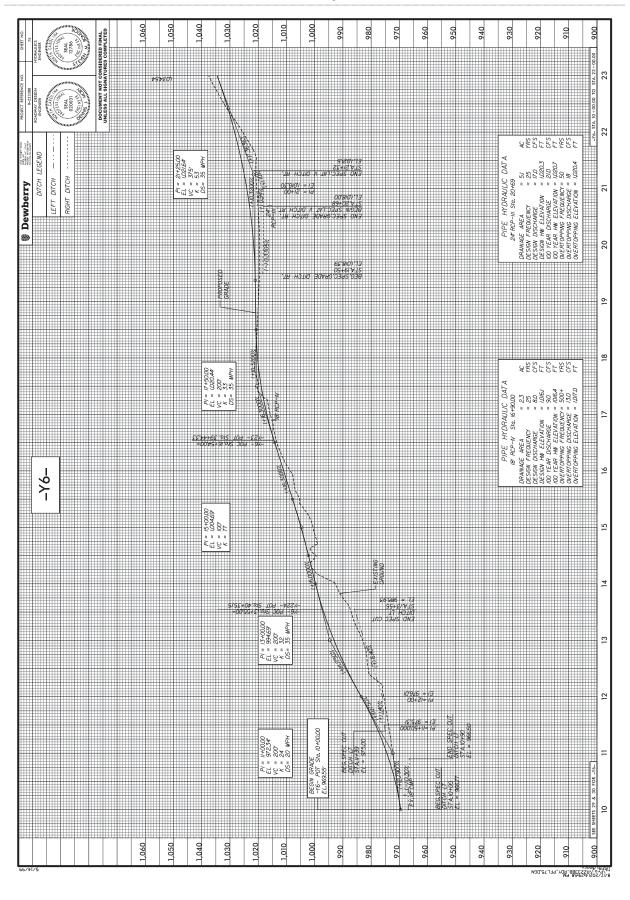


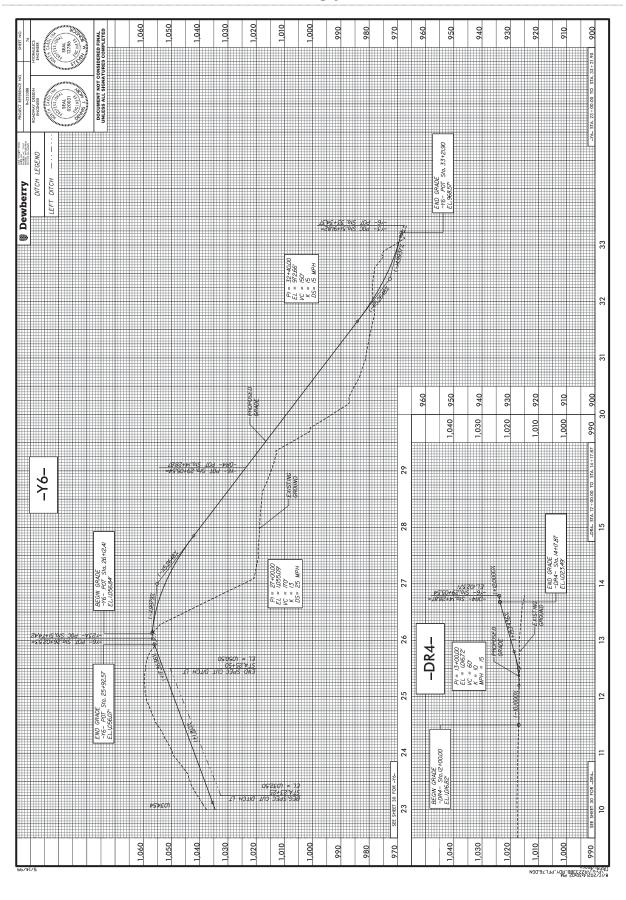


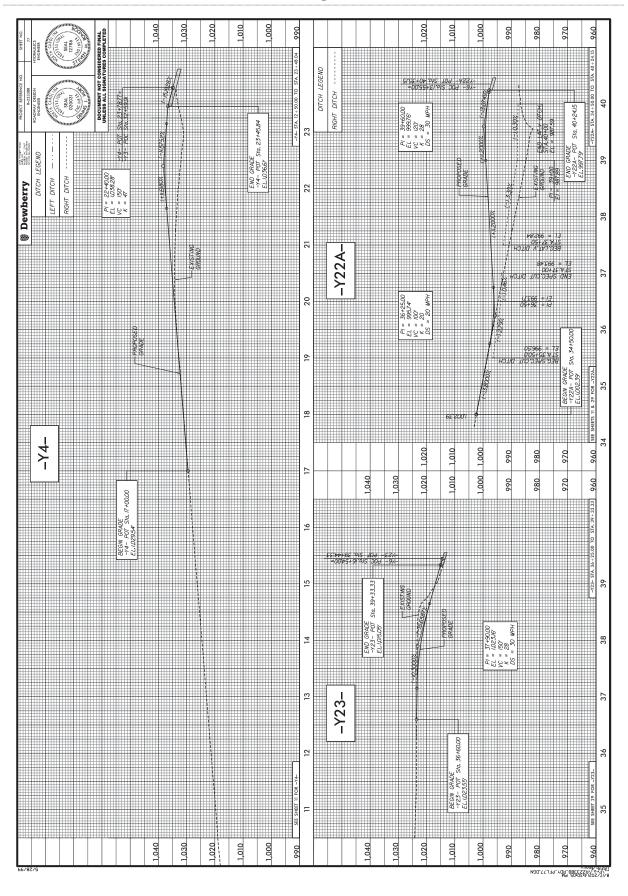


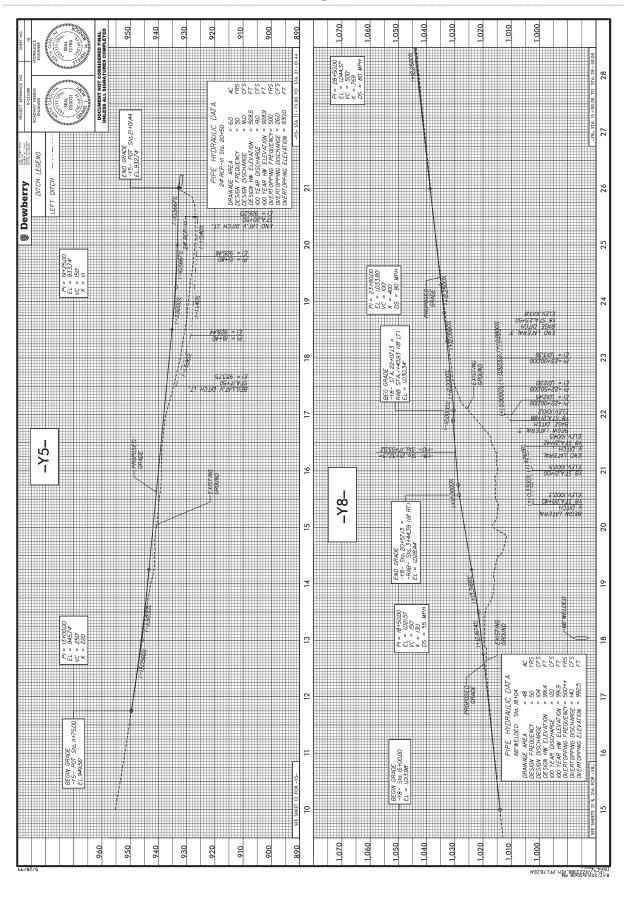


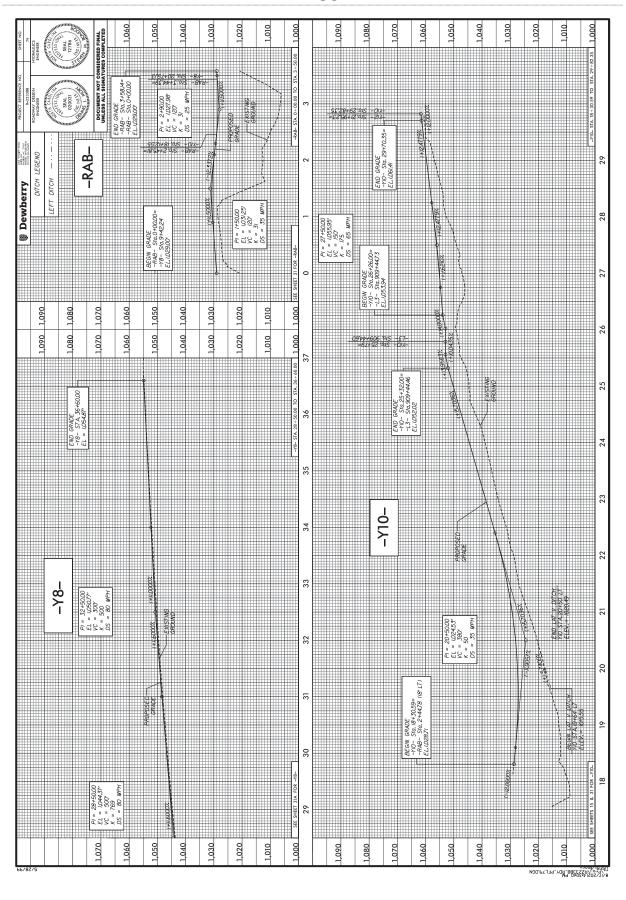


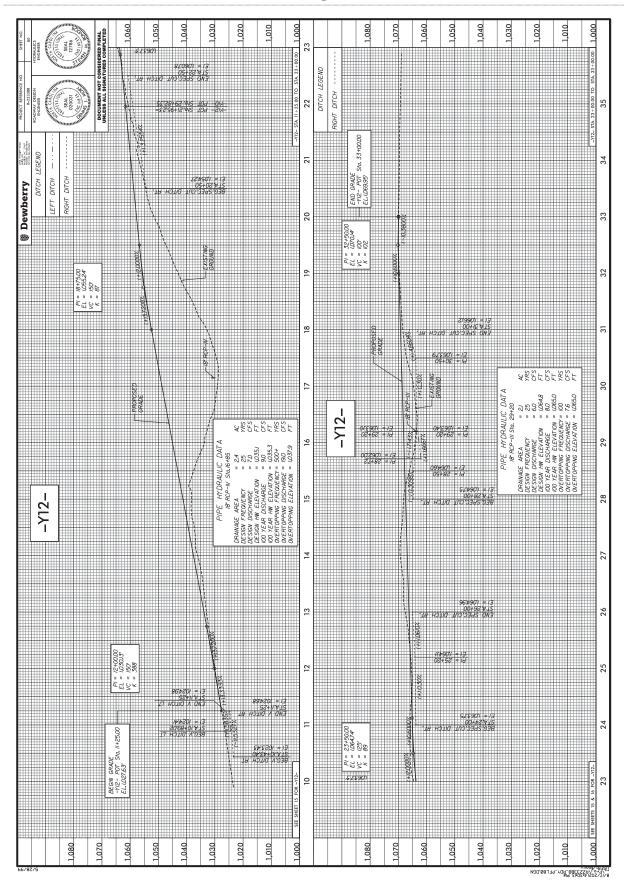


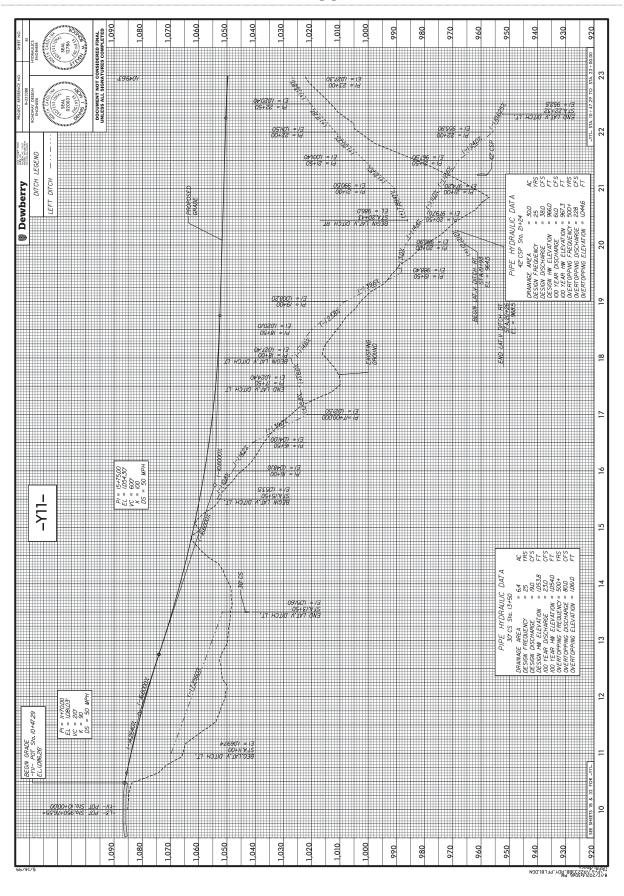


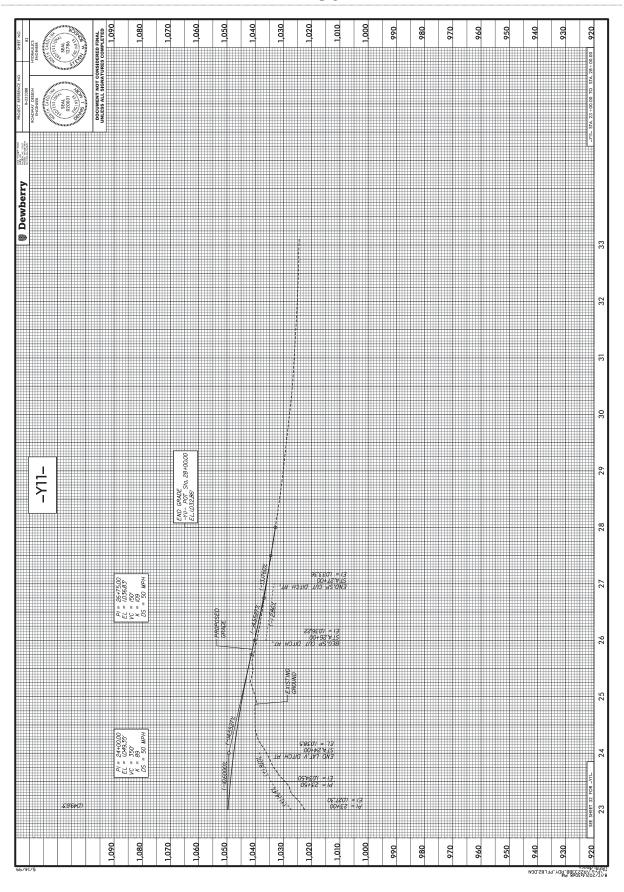


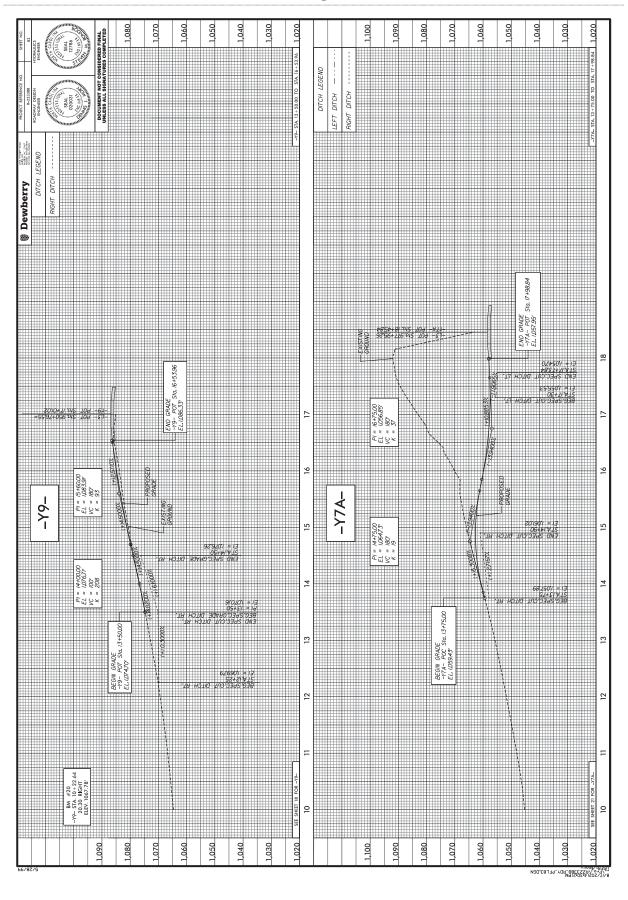


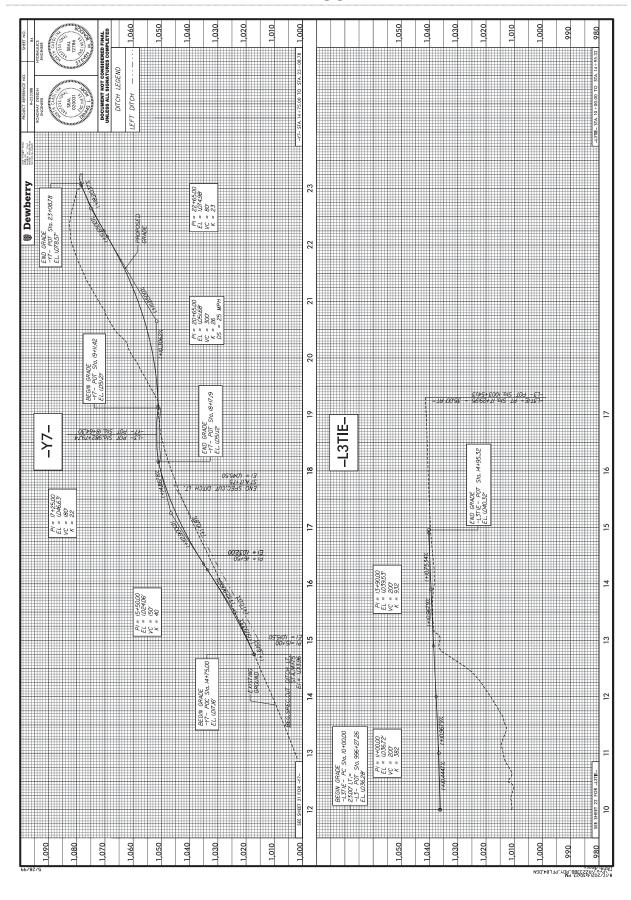


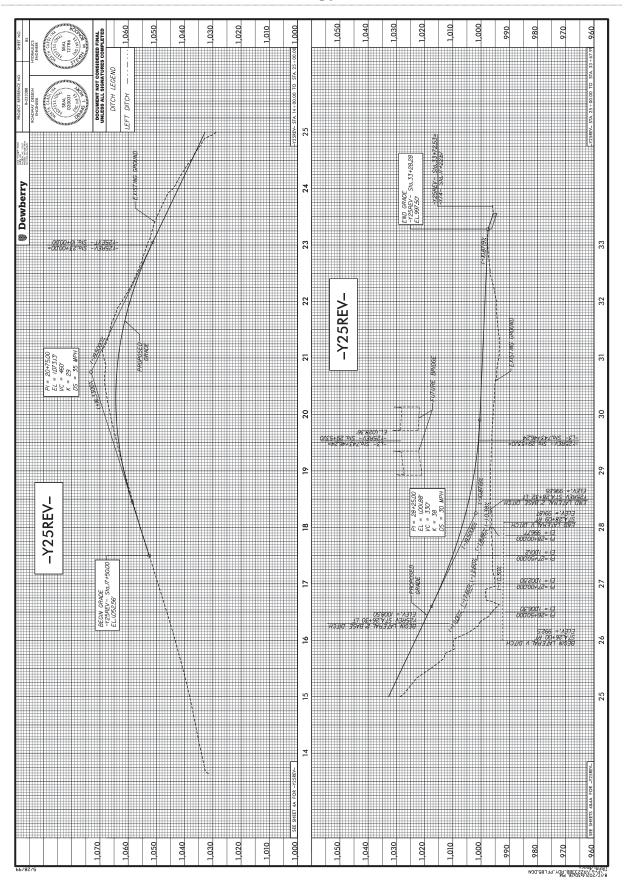


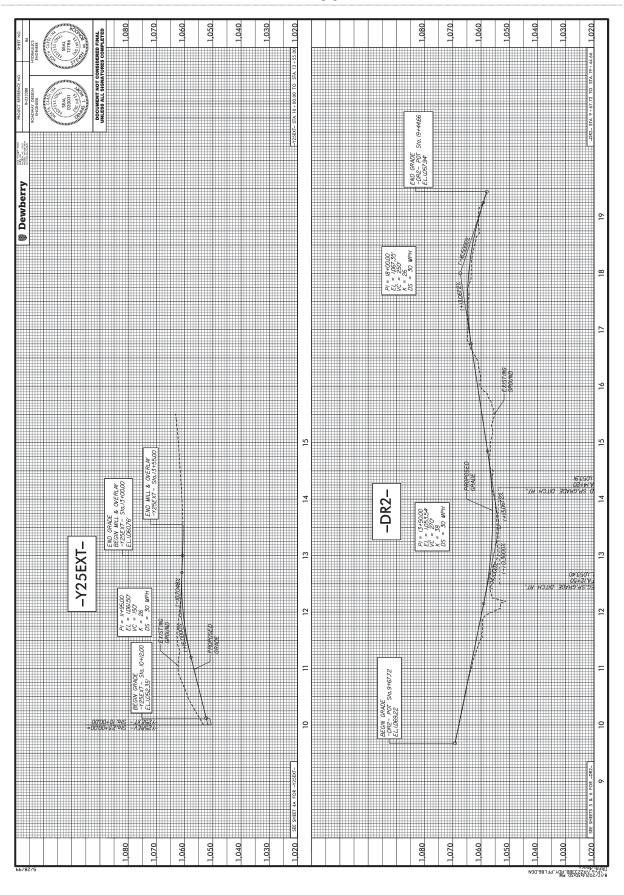












ITEMIZED PROPOSAL FOR CONTRACT NO. C204397

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
		F	ROADWAY ITEMS			
0001	0000100000-N	800	MOBILIZATION	Lump Sum	L.S.	
0002	0000400000-N	801	CONSTRUCTION SURVEYING	Lump Sum	L.S.	
0003	0001000000-Е	200	CLEARING & GRUBBING ACRE(S)	Lump Sum	L.S.	
 0004	0008000000-Е	200	SUPPLEMENTARY CLEARING & GRUB- BING	5 ACR		
0005	0015000000-N	205	SEALING ABANDONED WELLS	3 EA		
0006	0022000000-E	225	UNCLASSIFIED EXCAVATION	2,860,000 CY		
 0007	0028000000-N	SP	TYPE I STANDARD APPROACH FILL STATION *********** (20+88.94 -Y19-)	Lump Sum	L.S.	
 0008	0028000000-N	SP	TYPE I STANDARD APPROACH FILL STATION *********** (26+65.52 -Y3-)	Lump Sum	L.S.	
 0009	0029000000-N	SP	TYPE III REINFORCED APPROACH FILL, STATION ******* (774+41.49 -L3- LT)	Lump Sum	L.S.	
 0010	0029000000-N	SP	TYPE III REINFORCED APPROACH FILL, STATION ******* (774+41.49 -L3- RT)	Lump Sum	L.S.	
 0011	0036000000-Е	225	UNDERCUT EXCAVATION	13,500 CY		
0012	0134000000-E	240	DRAINAGE DITCH EXCAVATION	25,650 CY		
0013	0141000000-E	240	BERM DITCH CONSTRUCTION	1,810 LF		
 0014	0156000000-E	250	REMOVAL OF EXISTING ASPHALT PAVEMENT	47,600 SY		
 0015	0163000000-E	250	REMOVAL OF EXISTING CONCRETE PAVEMENT	3,400 SY		
 0016	0177000000-E	250	BREAKING OF EXISTING ASPHALT PAVEMENT	7,500 SY		
 0017	0192000000-N	260	PROOF ROLLING	100 HR		
0018	0195000000-E	265	SELECT GRANULAR MATERIAL	11,500 CY		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0019	0196000000-Е	270	GEOTEXTILE FOR SOIL STABILIZATION	53,500 SY		
0020	0255000000-E	SP	GENERIC GRADING ITEM HAULING AND DISPOSAL OF PETRO- LEUM CONTAMINATED SOIL	100 TON		
0021	0318000000-E	300	FOUNDATION CONDITIONING MATE- RIAL, MINOR STRUCTURES	8,218 TON		
0022	0320000000-E	300	FOUNDATION CONDITIONING GEO- TEXTILE	25,834 SY		
0023	0335200000-E	305	15" DRAINAGE PIPE	2,484 LF		
0024	0335300000-Е	305	18" DRAINAGE PIPE	1,796 LF		
0025	0335400000-Е	305	24" DRAINAGE PIPE	1,328 LF		
0026	0335500000-Е	305	30" DRAINAGE PIPE	1,036 LF		
0027	0335600000-Е	305	36" DRAINAGE PIPE	264 LF		
0028	0335700000-E	305	42" DRAINAGE PIPE	32 LF		
0029	0354000000-E	310	***" RC PIPE CULVERTS, CLASS ***** (54", V)	352 LF		
0030	0366000000-E	310	15" RC PIPE CULVERTS, CLASS III	14,496 LF		
0031	0372000000-E	310	18" RC PIPE CULVERTS, CLASS III	6,076 LF		
0032	0378000000-E	310	24" RC PIPE CULVERTS, CLASS III	4,800 LF		
0033	0384000000-E	310	30" RC PIPE CULVERTS, CLASS III	3,316 LF		
0034	0390000000-E	310	36" RC PIPE CULVERTS, CLASS III	1,700 LF		
0035	0396000000-E	310	42" RC PIPE CULVERTS, CLASS	1,256 LF		

Line #	Item Number	Sec #	Description	Quantity Unit Cost	Amount
0036	0402000000-E	310	48" RC PIPE CULVERTS, CLASS III	544 LF	
0037	0408000000-E	310	54" RC PIPE CULVERTS, CLASS III	836 LF	
0038	0426000000-E	310	72" RC PIPE CULVERTS, CLASS III	24 LF	
0039	0448300000-E	310	18" RC PIPE CULVERTS, CLASS IV	172 LF	
0040	0448500000-E	310	30" RC PIPE CULVERTS, CLASS IV	272 LF	
0041	0448600000-E	310	36" RC PIPE CULVERTS, CLASS IV	36 LF	
0042	0536000000-E	310	***" HDPE PIPE CULVERTS (8")	44 LF	
0043	0576000000-E	310	**" CS PIPE CULVERTS, *****" THICK (36", 0.079")	672 LF	
0044	0576000000-E	310	**" CS PIPE CULVERTS, *****" THICK (42", 0.109")	588 LF	
 0045	0576000000-E	310	**" CS PIPE CULVERTS, *****" THICK (60", 0.138")	56 LF	
0046	0582000000-E	310	15" CS PIPE CULVERTS, 0.064" THICK	2,012 LF	
0047	0588000000-E	310	18" CS PIPE CULVERTS, 0.064" THICK	2,360 LF	
0048	0594000000-E	310	24" CS PIPE CULVERTS, 0.064" THICK	784 LF	
0049	0600000000-E	310	30" CS PIPE CULVERTS, 0.079" THICK	648 LF	
0050	0636000000-E	310	**" CS PIPE ELBOWS, *****" THICK (15", 0.064")	16 EA	
0051	0636000000-E	310	**" CS PIPE ELBOWS, *****" THICK (18". 0.064")	14 EA	

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0052	0973100000-Е	330	**" WELDED STEEL PIPE, ****" THICK, GRADE B IN SOIL (42", 0.625")	276 LF		
0053	0973100000-Е	330	**" WELDED STEEL PIPE, ****" THICK, GRADE B IN SOIL (66", 0.875")	122 LF		
0054	0973300000-Е	330	**" WELDED STEEL PIPE, ****" THICK, GRADE B NOT IN SOIL (36", 0.500")	346 LF		
0055	0995000000-E	340	PIPE REMOVAL	4,702 LF		
0056	0996000000-N	350	PIPE CLEAN OUT	4 EA		
0057	1000000000-Е	462	6" SLOPE PROTECTION	310 SY		
0058	1011000000-N	500	FINE GRADING	Lump Sum	L.S.	
0059	1044000000-Е	501	LIME TREATED SOIL (SLURRY METHOD)	184,940 SY		
0060	1066000000-Е	501	LIME FOR LIME TREATED SOIL	2,220 TON		
0061	1099500000-Е	505	SHALLOW UNDERCUT	15,000 CY		
0062	1099700000-Е	505	CLASS IV SUBGRADE STABILIZA- TION	39,800 TON		
0063	1110000000-E		STABILIZER AGGREGATE	1,500 TON		
0064	1115000000-Е	SP	GEOTEXTILE FOR PAVEMENT STA- BILIZATION	129,200 SY		
0065	1121000000-E	520	AGGREGATE BASE COURSE	92,300 TON		
0066	1176000000-E	542	SOIL CEMENT BASE	184,940 SY		
0067	1187000000-E	542	PORTLAND CEMENT FOR SOIL CE- MENT BASE	5,179 TON		
0068	1209000000-E	543	ASPHALT CURING SEAL	55,490 GAL		
0069	1220000000-E	545	INCIDENTAL STONE BASE	10,000 TON		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0070	1231000000-Е	560	SHOULDER BORROW	38,000 CY		
0071	1275000000-E	600	PRIME COAT	180 GAL		
0072	1297000000-E	607	MILLING ASPHALT PAVEMENT, ***" DEPTH (1-1/2")	6,870 SY		
0073	1308000000-E	607	MILLING ASPHALT PAVEMENT, ***" TO *****" (0" TO 3")	6,200 SY		
0074	1330000000-E	607	INCIDENTAL MILLING	3,450 SY		
0075	1491000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0C	28,717 TON		
0076	1503000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C	43,600 TON		
0077	1519000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	22,774 TON		
0078	1523000000-Е	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	34,220 TON		
0079	1575000000-Е		ASPHALT BINDER FOR PLANT MIX	6,960 TON		
0080	1693000000-E		ASPHALT PLANT MIX, PAVEMENT REPAIR	1,000 TON		
0081	1840000000-E	665	MILLED RUMBLE STRIPS (ASPHALT CONCRETE)	92,000 LF		
0082	1891000000-Е	SP	GENERIC PAVING ITEM 7" CONCRETE TRUCK APRON	590 SY		
0083	2000000000-N	806	RIGHT-OF-WAY MARKERS	575 EA		
0084	2022000000-Е	815	SUBDRAIN EXCAVATION	1,344 CY		
0085	2026000000-Е	815	GEOTEXTILE FOR SUBSURFACE DRAINS	2,000 SY		
0086	2033000000-Е	815	SUBDRAIN FINE AGGREGATE	336 CY		
0087	2036000000-Е	815	SUBDRAIN COARSE AGGREGATE	336 CY		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0088	2044000000-E	815	6" PERFORATED SUBDRAIN PIPE	4,000 LF		
0089	2070000000-N	815	SUBDRAIN PIPE OUTLET	 8 EA		
0090	2077000000-Е	815	6" OUTLET PIPE	48 LF		
0091	2099000000-Е	816	SHOULDER DRAIN	20,800 LF		
0092	2110000000-E	816	4" SHOULDER DRAIN PIPE	20,832 LF		
0093	2121000000-E	816	4" OUTLET PIPE FOR SHOULDER DRAINS	2,036 LF		
 0094	2132000000-N	816	CONCRETE PAD FOR SHOULDER DRAIN PIPE OUTLET	40 EA		
 0095	2143000000-E	818	BLOTTING SAND	20 TON		
0096	2209000000-E	838	ENDWALLS	41.4 CY		
0097	2220000000-E	838	REINFORCED ENDWALLS	24.3 CY		
0098	2253000000-E	840	PIPE COLLARS	6.413 CY		
0099	2264000000-E	840	PIPE PLUGS	1.504 CY		
0100	2275000000-E	SP	FLOWABLE FILL	137 CY		
0101	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	 435 EA		
0102	2297000000-E	840	MASONRY DRAINAGE STRUCTURES	24.72 CY		
0103		840	MASONRY DRAINAGE STRUCTURES	546.7 LF		
0104	2364000000-N	840	FRAME WITH TWO GRATES, STD 840.16	54 EA		
 0105	2364200000-N	840	FRAME WITH TWO GRATES, STD 840.20	41 EA		
 0106	2365000000-N	840	FRAME WITH TWO GRATES, STD 840.22	172 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0107	2366000000-N	840	FRAME WITH TWO GRATES, STD 840.24	7 EA		
0108	2367000000-N		FRAME WITH TWO GRATES, STD 840.29	1 EA		
0109	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	7 EA		
0110	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	42 EA		
 0111	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	31 EA		
0112	2396000000-N	840	FRAME WITH COVER, STD 840.54	41 EA		
0113	2407000000-N	840	STEEL FRAME WITH TWO GRATES, STD 840.37	15 EA		
0114	2451000000-N	852	CONCRETE TRANSITIONAL SECTION FOR DROP INLET	34 EA		
0115	2462000000-E	836	**" SLUICE GATE (8")	2 EA		
0116	2473000000-N	SP	GENERIC DRAINAGE ITEM ENERGY DISSIPATOR BASIN	17 EA		
0117	2535000000-E	846	**"X **" CONCRETE CURB (8" X 12")	230 LF		
0118	2549000000-E	846	2'-6" CONCRETE CURB & GUTTER	18,400 LF		
0119		846	SHOULDER BERM GUTTER	5,310 LF		
0120	2577000000-E	846	CONCRETE EXPRESSWAY GUTTER	750 LF		
0121	2591000000-E	848	4" CONCRETE SIDEWALK	5,480 SY		
0122	2605000000-N	848	CONCRETE CURB RAMPS	6 EA		
0123	2612000000-E	848	6" CONCRETE DRIVEWAY	560 SY		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0124	2619000000-Е	850	4" CONCRETE PAVED DITCH	177 SY		
0125	2647000000-E	852	5" MONOLITHIC CONCRETE ISLANDS (SURFACE MOUNTED)	8,850 SY		
0126	2655000000-E	852	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)	490 SY		
0127	2703000000-E	854	CONCRETE BARRIER, TYPE ******* (SINGLE SLOPE)	655 LF		
0128	2724000000-E	857	PRECAST REINFORCED CONCRETE BARRIER, SINGLE FACED	5,350 LF		
0129	2752000000-E	SP	GENERIC PAVING ITEM 2'-0" MODIFIED VALLEY GUTTER	360 LF		
0130	2759000000-N	SP	GENERIC PAVING ITEM VERTICAL CONCRETE BARRIER TRANSITION	2 EA		
0131	3001000000-N	SP	IMPACT ATTENUATOR UNITS, TYPE TL-3	2 EA		
0132	303000000-Е	862	STEEL BEAM GUARDRAIL	29,500 LF		
0133	3045000000-Е	862	STEEL BEAM GUARDRAIL, SHOP CURVED	1,475 LF		
0134	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	30 EA		
0135		862	GUARDRAIL END UNITS, TYPE AT-1	9 EA		
0136	3210000000-N		GUARDRAIL END UNITS, TYPE CAT-1	23 EA		
0137	3215000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE III	4 EA		
0138	3287000000-N	SP	GUARDRAIL END UNITS, TYPE TL-3	44 EA		
0139	3288000000-N		GUARDRAIL END UNITS, TYPE TL-2	23 EA		
0140	3317000000-N		GUARDRAIL ANCHOR UNITS, TYPE B-77	20 EA		
0141	3360000000-E	863	REMOVE EXISTING GUARDRAIL	7,400 LF		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0142	338000000-Е	862	TEMPORARY STEEL BEAM GUARDRAIL	500 LF		
0143	3389150000-N	SP	TEMPORARY GUARDRAIL END UNITS, TYPE ***** (TL-3)	2 EA		
 0144	3389400000-Е	865	DOUBLE FACED CABLE GUIDERAIL	13,200 LF		
0145	3389500000-N	865	ADDITIONAL GUIDERAIL POSTS	10 EA		
0146	3389600000-N	865	CABLE GUIDERAIL ANCHOR UNITS	40 EA		
0147	3435000000-N	SP	GENERIC GUARDRAIL ITEM PERMANENT BOLLARDS	6 EA		
0148	3435000000-N	SP	GENERIC GUARDRAIL ITEM REMOVABLE BOLLARDS	3 EA		
0149	3503000000-Е	866	WOVEN WIRE FENCE, 47" FABRIC	60,960 LF		
0150	3509000000-E	866	4" TIMBER FENCE POSTS, 7'-6" LONG	3,730 EA		
0151	3515000000-Е	866	5" TIMBER FENCE POSTS, 8'-0" LONG	1,170 EA		
 0152	3565000000-E	866	DOUBLE GATES, **" HIGH, **' WIDE, **' OPENING (47", 8', 16')	1 EA		
 0153	3575000000-E	SP	GENERIC FENCING ITEM BIKE AND PEDESTRIAN SAFETY RAIL	810 LF		
0154	3628000000-Е	876	RIP RAP, CLASS I	3,500 TON		
0155	3635000000-E	876	RIP RAP, CLASS II	6,625 TON		
0156	3649000000-E	876	RIP RAP, CLASS B	6,465 TON		
0157	3656000000-E	876	GEOTEXTILE FOR DRAINAGE	44,475 SY		
0158	4048000000-Е	902	REINFORCED CONCRETE SIGN FOUN- DATIONS	12 CY		
 0159	4054000000-E	902	PLAIN CONCRETE SIGN FOUNDA- TIONS	2 CY		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0160	4057000000-E	SP	OVERHEAD FOOTING	30 CY		
0161	4060000000-Е	903	SUPPORTS, BREAKAWAY STEEL BEAM	4,817 LB		
0162	4066000000-Е	903	SUPPORTS, SIMPLE STEEL BEAM	6,948 LB		
0163	4072000000-Е	903	SUPPORTS, 3-LB STEEL U-CHANNEL	6,280 LF		
0164	4078000000-Е	903	SUPPORTS, 2-LB STEEL U-CHANNEL	10 EA		
0165	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUC- TURE AT STA ****** (861+15-L3-)	Lump Sum	L.S.	
0166	4096000000-N	904	SIGN ERECTION, TYPE D	5 EA		
0167	4102000000-N	904	SIGN ERECTION, TYPE E	339 EA		
0168	4108000000-N	904	SIGN ERECTION, TYPE F	73 EA		
0169	4109000000-N	904	SIGN ERECTION, TYPE *** (OVER- HEAD) (A)	3 EA		
0170	4109000000-N	904	SIGN ERECTION, TYPE *** (OVER- HEAD) (B)	2 EA		
0171	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)	18 EA		
 0172	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B)	9 EA		
0173	4114000000-N	904	SIGN ERECTION, MILEMARKERS	9 EA		
0174	4116100000-N	904	SIGN ERECTION, RELOCATE TYPE **** (GROUND MOUNTED) (D)	3 EA		
 0175	4116100000-N	904	SIGN ERECTION, RELOCATE TYPE **** (GROUND MOUNTED) (E)	3 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0176	4116100000-N	904	SIGN ERECTION, RELOCATE TYPE **** (GROUND MOUNTED) (F)	2 EA		
0177	4155000000-N	907	DISPOSAL OF SIGN SYSTEM, U- CHANNEL	93 EA		
0178	4192000000-N	907	DISPOSAL OF SUPPORT, U-CHANNEL	4 EA		
0179	4238000000-N	907	DISPOSAL OF SIGN, D, E OR F	12 EA		
0180	4370000000-N	SP	GENERIC SIGNING ITEM DISPOSAL OF FLASHER SYSTEM	Lump Sum	L.S.	
0181	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	1,906 SF		
0182	4405000000-E	1110	WORK ZONE SIGNS (PORTABLE)	672 SF		
0183	4410000000-Е	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	432 SF		
0184	4415000000-N	1115	FLASHING ARROW BOARD	2 EA		
0185	4420000000-N	1120	PORTABLE CHANGEABLE MESSAGE SIGN	2 EA		
0186	4430000000-N	1130	DRUMS	920 EA		
0187	4434000000-N	SP	SEQUENTIAL FLASHING WARNING LIGHTS	30 EA		
0188	4435000000-N	1135	CONES	50 EA		
0189	4445000000-E	1145	BARRICADES (TYPE III)	352 LF		
0190	4447000000-E	SP	PEDESTRIAN CHANNELIZING DE- VICES	128 LF		
0191	4455000000-N	1150	FLAGGER	550 DAY		
0192	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	2 EA		
0193	4470000000-N	1160	REMOVE & RESET TEMPORARY CRASH CUSHION	2 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0194	448000000-N	1165	ТМА	2 EA		
0195	4485000000-E	1170	PORTABLE CONCRETE BARRIER	1,800 LF		
0196	4500000000-E	1170	REMOVE AND RESET PORTABLE CON- CRETE BARRIER	1,800 LF		
0197	4507000000-E	1170	WATER FILLED BARRIER	700 LF		
0198	4508000000-E	SP	REMOVE AND RESET WATER FILLED BARRIER	700 LF		
0199	4510000000-N	1190	LAW ENFORCEMENT	64 HR		
0200	4516000000-N	1180	SKINNY DRUM	110 EA		
0201	4520000000-N	1266	TUBULAR MARKERS (FIXED)	68 EA		
0202	4650000000-N	1251	TEMPORARY RAISED PAVEMENT MARKERS	1,618 EA		
0203	4695000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)	1,687 LF		
0204	4720000000-E	1205	THERMOPLASTIC PAVEMENT MARKING CHARACTER (90 MILS)	26 EA		
0205	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	223 EA		
0206	4770000000-E	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)	1,960 LF		
0207	4775000000-E	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (6") (IV)	302 LF		
0208	4805000000-N	1205	COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (I)	2 EA		
0209	4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	296,225 LF		
0210	4815000000-E	1205	PAINT PAVEMENT MARKING LINES (6")	23,546 LF		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0211	4820000000-Е	1205	PAINT PAVEMENT MARKING LINES (8")	1,400 LF		
 0212	4825000000-E	1205	PAINT PAVEMENT MARKING LINES (12")	576 LF		
0213	4835000000-Е	1205	PAINT PAVEMENT MARKING LINES (24")	770 LF		
0214	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	76 EA		
0215	4850000000-Е	1205	REMOVAL OF PAVEMENT MARKING LINES (4")	32,600 LF		
 0216	4860000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (8")	400 LF		
 0217	4870000000-Е	1205	REMOVAL OF PAVEMENT MARKING LINES (24")	110 LF		
 0218	4875000000-N	1205	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS	12 EA		
0219	4890000000-E	SP	GENERIC PAVEMENT MARKING ITEM POLYUREA PAVEMENT MARKING LINES, 12" 20 MILS (STANDARD GLASS BEADS)	10,194 LF		
0220	4890000000-E	SP	GENERIC PAVEMENT MARKING ITEM POLYUREA PAVEMENT MARKING LINES, 4", 20 MILS (STANDARD GLASS BEADS)	86,125 LF		
 0221	4890000000-E	SP	GENERIC PAVEMENT MARKING ITEM POLYUREA PAVEMENT MARKING LINES, 6", 20 MILS (STANDARD GLASS BEADS)	112,564 LF		
0222	4890000000-E	SP	GENERIC PAVEMENT MARKING ITEM POLYUREA PAVEMENT MARKING LINES, 8", 20 MILS (STANDARD GLASS BEADS)	1,844 LF		
 0223	4891000000-E	1205	GENERIC PAVEMENT MARKING ITEM THERMOPLASTIC PAVEMENT MARKING LINES (24", 90 MILS)	430 LF		
 0224	4895000000-N	SP	GENERIC PAVEMENT MARKING ITEM NON-CAST IRON SNOWPLOWABLE PAVEMENT MARKER	1,606 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0225	4900000000-N	1251	PERMANENT RAISED PAVEMENT MARKERS	8 EA		
0226	4915000000-E	1264	7' U-CHANNEL POSTS	48 EA		
0227	4955000000-N	1264	OBJECT MARKERS (END OF ROAD)	54 EA		
0228	5325200000-E	1510	2" WATER LINE	1,350 LF		
0229	5325600000-E	1510	6" WATER LINE	2,515 LF		
0230	5325800000-E	1510	8" WATER LINE	960 LF		
0231	5326000000-E	1510	10" WATER LINE	5,790 LF		
0232	5326200000-E	1510	12" WATER LINE	3,130 LF		
0233	5329000000-E	1510	DUCTILE IRON WATER PIPE FITTINGS	8,349 LB		
0234	5536000000-E	1515	2" VALVE	5 EA		
0235	5540000000-E	1515	6" VALVE	35 EA		
0236		1515	8" VALVE	4 EA		
0237	5552000000-E		10" VALVE	22 EA		
	5558000000-E			6 EA		
	5571600000-E	1515	6" TAPPING SLEEVE & VALVE	1 EA		
0241	5606000000-E			5 EA		
0242	5648000000-N	1515	RELOCATE WATER METER	9 EA		
0243	5649000000-N	1515	RECONNECT WATER METER	12 EA		
0244	5666000000-N	1515	FIRE HYDRANT	2 EA		
0245	5672000000-N	1515	RELOCATE FIRE HYDRANT	15 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0246	5691300000-Е	1520	8" SANITARY GRAVITY SEWER	7,698.23 LF		
0247	5691400000-E	1520	10" SANITARY GRAVITY SEWER	1,888.1 LF		
0248	5691500000-E	1520	12" SANITARY GRAVITY SEWER	1,337.25 LF		
0249	5709200000-E	1520	4" FORCE MAIN SEWER	3,117 LF		
0250	5709400000-E	1520	8" FORCE MAIN SEWER	310 LF		
0251	5775000000-E	 1525	4' DIA UTILITY MANHOLE			
0252	5801000000-E	1530	ABANDON 8" UTILITY PIPE	4,983.8 LF		
0253	5802000000-E	1530	ABANDON 10" UTILITY PIPE	4,827 LF		
0254	5804000000-E	1530	ABANDON 12" UTILITY PIPE	584 LF		
0255	5815000000-N	1530	REMOVE WATER METER	26 EA		
0256	5835700000-E	1540	16" ENCASEMENT PIPE	270 LF		
0257	5835800000-E	1540	18" ENCASEMENT PIPE	1,468 LF		
0258	5836000000-E	1540	24" ENCASEMENT PIPE	1,386 LF		
0259	6000000000-E	1605	TEMPORARY SILT FENCE	143,000 LF		
0260	6006000000-E	1610	STONE FOR EROSION CONTROL, CLASS A	8,860 TON		
0261	6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	40,810 TON		
0262	6012000000-E	1610	SEDIMENT CONTROL STONE	19,350 TON		
0263	6015000000-E		TEMPORARY MULCHING	711 ACR		
0264	6018000000-E		SEED FOR TEMPORARY SEEDING			
0265	6021000000-Е	1620	FERTILIZER FOR TEMPORARY SEED- ING	141.5 TON		

	5024000000-Е				
	5024000000-Е				
0267 60		1622	TEMPORARY SLOPE DRAINS	28,125 LF	
	 60 29 000000-Е	SP	SAFETY FENCE	 11,320 LF	
0268 60	 6030000000-Е	1630	SILT EXCAVATION	250,750 CY	
0269 60	 6036000000-E	1631	MATTING FOR EROSION CONTROL	892,500 SY	
0270 60	 6037000000-E	SP	COIR FIBER MAT	2,640 SY	
0271 60	 5038000000-Е	SP	PERMANENT SOIL REINFORCEMENT MAT	32,000 SY	 ,
0272 60	 6042000000-Е	 1632	1/4" HARDWARE CLOTH	22,655 LF	
0273 60	 6045000000-Е	SP	**" TEMPORARY PIPE (36")	135 LF	
0274 60	5046000000-E	1636	TEMPORARY PIPE FOR STREAM CROSSING	125 LF	 ,
0275 60	 5069000000-E	1638	STILLING BASINS	210 CY	
0276 60	 6070000000-N	1639	SPECIAL STILLING BASINS	 10 EA	
0277 60	 6071012000-Е	SP	COIR FIBER WATTLE	 14,930 LF	
0278 60	 5071013000-Е	SP	WATTLE BARRIER	31,250 LF	
0279 60	 6071020000-Е	SP	POLYACRYLAMIDE (PAM)	 17,715 LB	
0280 60	 6071030000-Е	1640	COIR FIBER BAFFLE	27,830 LF	
0281 60	 6071050000-Е	SP	**" SKIMMER (1-1/2")	75 EA	
0282 60	 5071050000-Е	 SP	**" SKIMMER (2")	18 EA	
0283 60	 6071050000-E	SP	**" SKIMMER (2-1/2")	13 EA	
0284 60	 6071050000-E	 SP	**" SKIMMER (3")	1 EA	

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0285	6084000000-E	1660	SEEDING & MULCHING	365 ACR		
0286	6087000000-Е	1660	MOWING	251 ACR		
0287	6090000000-Е	1661	SEED FOR REPAIR SEEDING	7,250 LB		
0288	6093000000-E	1661	FERTILIZER FOR REPAIR SEEDING	 19.25 TON		
0289	6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	9,500 LB		
0290	6108000000-E	 1665	FERTILIZER TOPDRESSING			
0291	6111000000-E	SP	IMPERVIOUS DIKE	770 LF		
0292	6114500000-N	 1667	SPECIALIZED HAND MOWING	180 MHR		
0293	6117000000-N	 SP	RESPONSE FOR EROSION CONTROL	150 EA		
0294	6117500000-N	 SP	CONCRETE WASHOUT STRUCTURE	32 EA		
0295	6120000000-E	SP	CULVERT DIVERSION CHANNEL	1,010 CY		
0296	6132000000-N	SP	GENERIC EROSION CONTROL ITEM FABRIC INSERT INLET PROTECTION DEVICE CLEANOUT	100 EA		
0297	6132000000-N	SP	GENERIC EROSION CONTROL ITEM FABRIC INSERT INLET PROTECTION DEVICE	33 EA		
0298	7048500000-E	1705	PEDESTRIAN SIGNAL HEAD (16", 1 SECTION W/COUNTDOWN)	4 EA		
0299	7060000000-Е	1705	SIGNAL CABLE	7,500 LF		
0300	7120000000-E	1705	VEHICLE SIGNAL HEAD (12", 3 SECTION)	32 EA		
0301	7132000000-E	1705	VEHICLE SIGNAL HEAD (12", 4 SECTION)	11 EA		
0302	7144000000-E	1705	VEHICLE SIGNAL HEAD (12", 5 SECTION)	3 EA		
0303	7264000000-E	1710	MESSENGER CABLE (3/8")	550 LF		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0304	7300000000-E	1715	UNPAVED TRENCHING (*********) (1, 2")	550 LF		
 0305	7300000000-E	 1715	UNPAVED TRENCHING (********) (2, 2")	405 LF		
 0306	7300000000-E	1715	UNPAVED TRENCHING (********) (4, 2")	310 LF		
0307	7301000000-E	 1715	DIRECTIONAL DRILL (***********) (1, 2")	200 LF		
0308	7301000000-E	1715	DIRECTIONAL DRILL (***********) (2, 2")	575 LF		
 0309	7301000000-E	1715	DIRECTIONAL DRILL (********) (3, 2")	 100 LF		
 0310	7301000000-E	 1715	DIRECTIONAL DRILL (*********) (4, 2")	275 LF		
 0311	7301000000-E	 1715	DIRECTIONAL DRILL (*********) (5, 2")	150 LF		
 0312	7324000000-N	 1716	JUNCTION BOX (STANDARD SIZE)	8 EA		
 0313	7348000000-N	1716	JUNCTION BOX (OVER-SIZED, HEA- VY DUTY)	10 EA		
 0314 	7360000000-N	1720	WOOD POLE	4 EA		
0315	7372000000-N	1721	GUY ASSEMBLY	7 EA		
0316	7408000000-E	1722	1" RISER WITH WEATHERHEAD	2 EA		
0317	7420000000-E	1722	2" RISER WITH WEATHERHEAD	3 EA		
0318	7444000000-E	1725	INDUCTIVE LOOP SAWCUT	3,600 LF		
0319	7456000000-E	1726	LEAD-IN CABLE (**********) (14-2)	11,000 LF		
0320	7481000000-N	SP	SITE SURVEY	1 EA		
0321	7481240000-N	SP	CAMERA WITHOUT INTERNAL LOOP EMULATOR PROCESSING UNIT	3 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0322	7481260000-N	SP	EXTERNAL LOOP EMULATOR PRO- CESSING UNIT	1 EA		
 0323	7575142010-N	1736	900MHZ SERIAL/ETHERNET SPREAD SPECTRUM RADIO	10 EA		
 0324	7588000000-N	SP	METAL POLE WITH SINGLE MAST ARM	10 EA		
 0325	7590000000-N	SP	METAL POLE WITH DUAL MAST ARM	2 EA		
0326	7613000000-N	SP	SOIL TEST	12 EA		
0327	7614100000-E	 SP	DRILLED PIER FOUNDATION	84 CY		
0328	7631000000-N	SP	MAST ARM WITH METAL POLE DE- SIGN	12 EA		
0329	7636000000-N	1745	SIGN FOR SIGNALS	14 EA		
0330	7642200000-N	1743	TYPE II PEDESTAL WITH FOUND- ATION	7 EA		
0331	7684000000-N	1750	SIGNAL CABINET FOUNDATION	4 EA		
0332	7696000000-N	1751	CONTROLLERS WITH CABINET (************************************	4 EA		
0333	7744000000-N	 1751	DETECTOR CARD (TYPE 170)	22 EA		
0334	7901000000-N	1753	CABINET BASE EXTENDER	4 EA		
0335	7948000000-N	1757	TRAFFIC SIGNAL REMOVAL	1 EA		
0336	7960000000-N	SP	METAL POLE FOUNDATION REMOVAL	1 EA		
0337	7972000000-N	SP	METAL POLE REMOVAL	1 EA		
0338	7980000000-N	SP	GENERIC SIGNAL ITEM 2070E CONTROLLER	6 EA		
0339	7980000000-N	SP	GENERIC SIGNAL ITEM PROTECTIVE COATING FOR DUAL MAST ARM POLE (BLACK)	2 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0340	7980000000-N	SP	GENERIC SIGNAL ITEM PROTECTIVE COATING FOR SIGNAL PEDESTAL (BLACK)	7 EA		
0341	7980000000-N	SP	GENERIC SIGNAL ITEM PROTECTIVE COATING FOR SINGLE MAST ARM POLE (BLACK)	10 EA		
0392	5673000000-Е	1515	FIRE HYDRANT LEG	305.9 LF		
0393	5686000000-E	1515	**" WATER SERVICE LINE (2")	94.7 LF		
0394	5776000000-E	1525	5' DIA UTILITY MANHOLE	19 EA		
0395	5781000000-E	1525	UTILITY MANHOLE WALL 4' DIA	139 LF		
0396	5782000000-E	1525	UTILITY MANHOLE WALL 5' DIA	215 LF		
0397	5912000000-N	SP	GENERIC UTILITY ITEM UTILITY COORDINATOR	Lump Sum	L.S.	
0398	0973100000-E	330	**" WELDED STEEL PIPE, ****" THICK, GRADE B IN SOIL (36", 0.500")	346 LF		
0399	0973300000-Е	330	**" WELDED STEEL PIPE, ****" THICK, GRADE B NOT IN SOIL (42", 0.625")	276 LF		
0400	0973300000-Е	330	**" WELDED STEEL PIPE, ****" THICK, GRADE B NOT IN SOIL (66", 0.875")	122 LF		
0401	3575000000-E	SP	GENERIC FENCING ITEM ORNAMENTAL WOOD FENCE	100 LF		
0402	4360000000-N	SP	GENERIC SIGNING ITEM RRFB ASSEMBLY	4 EA		
0403	4360000000-N	SP	GENERIC SIGNING ITEM ADVANCE WARNING FLASHING BEA- CON ASSEMBLY	3 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
		C	CULVERT ITEMS			
0342	8056000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION ************************************	Lump Sum	L.S.	
0343	8065000000-N	SP	ASBESTOS ASSESSMENT	Lump Sum	L.S.	
 0344	8126000000-N	414	CULVERT EXCAVATION, STA ****** (735+38.59 -L3-)	Lump Sum	L.S.	
0345	8126000000-N	414	CULVERT EXCAVATION, STA ****** (797+66.00 -L3-)	Lump Sum	L.S.	
0346	8126000000-N	414	CULVERT EXCAVATION, STA ****** (830+02.00 -L3-)	Lump Sum	L.S.	
 0347	8126000000-N	414	CULVERT EXCAVATION, STA ****** (874+45.00 -L3-)	Lump Sum	L.S.	
0348	8133000000-E	414	FOUNDATION CONDITIONING MATER- IAL, BOX CULVERT	2,287 TON		
0349	8196000000-E	420	CLASS A CONCRETE (CULVERT)	5,708.1 CY		
0350	8245000000-E	425	REINFORCING STEEL (CULVERT)	920,565 LB		
0351	8590000000-E	876	RIP RAP, CLASS ** (II)	32 TON		
0352	8622000000-E		GEOTEXTILE FOR DRAINAGE	1,695 SY		
		V	VALL ITEMS			
0353	8504000000-E	460	CONCRETE BARRIER RAIL WITH MOMENT SLAB	268 LF		
0354	8801000000-E	SP	MSE RETAINING WALL NO **** (1)	6,350 SF		
0355	8801000000-E	SP	MSE RETAINING WALL NO **** (2)	4,335 SF		
0356	8801000000-E	SP	MSE RETAINING WALL NO **** (6)	4,665 SF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0357	8847000000-E	SP	GENERIC RETAINING WALL ITEM ARCHITECTURAL SURFACE TREAT- MENT	149,026 SF		
0358	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW11-	18,303 SF		
0359	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW13-	26,005 SF		
0360	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW15-	7,308 SF		
0361	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW5A-	14,210 SF		
0362	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW5B-	8,208 SF		
0363	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW8-	18,010 SF		
			STRUCTURE ITEMS			
0364	8091000000-N	410	FOUNDATION EXCAVATION FOR BENT ** AT STATION ************************************	Lump Sum	L.S.	
0365	8105560000-E	411	4'-0" DIA DRILLED PIERS IN SOIL	50 LF		
0366	8105660000-E	411	4'-0" DIA DRILLED PIERS NOT IN SOIL	50 LF		
0367	8115000000-N	411	CSL TESTING	1 EA		
0368	8147000000-E	420	REINFORCED CONCRETE DECK SLAB	38,861 SF		
0369	8161000000-E	420	GROOVING BRIDGE FLOORS	40,654 SF		
0370	8182000000-E	420	CLASS A CONCRETE (BRIDGE)	601.6 CY		
0371	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ************************************	Lump Sum	L.S.	

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0372	8210000000-N	422	BRIDGE APPROACH SLABS, STATION	Lump Sum	L.S.	
			(26+65.52 -Y3-)			
0373	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ************************************	Lump Sum	L.S.	
0374	8210000000-N	 422	BRIDGE APPROACH SLABS, STATION ************************(774+41.49 -L3- RT)	Lump Sum	L.S.	
0375	8217000000-E	425	REINFORCING STEEL (BRIDGE)	98,466 LB		
0376	8238000000-E	425	SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	7,072 LB		
0377	8265000000-E	430	54" PRESTRESSED CONCRETE GIR- DERS	2,104.67 LF		
0378	8277000000-E	430	MODIFIED 72" PRESTRESSED CONC GIRDERS	2,254.9 LF		
0379	8328200000-E	450	PILE DRIVING EQUIPMENT SETUP FOR *** STEEL PILES (HP 12 X 53)	72 EA		
0380	8328200000-E	450	PILE DRIVING EQUIPMENT SETUP FOR *** STEEL PILES (HP 14 X 73)	30 EA		
0381	8364000000-E	450	HP12X53 STEEL PILES	 4,005 LF		
0382	8384000000-E	450	HP14X73 STEEL PILES	940 LF		
0383	8391000000-N	450	STEEL PILE POINTS	18 EA		
0384	8392500000-E	450	PREDRILLING FOR PILES	170 LF		
0385	8475000000-E	460	TWO BAR METAL RAIL	496.77 LF		
0386	8482000000-E	460	THREE BAR METAL RAIL	343.92 LF		
0387	8503000000-E	460	CONCRETE BARRIER RAIL	407.2 LF		
0388	8505000000-E	460	VERTICAL CONCRETE BARRIER RAIL	277.14 LF		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0389	8517000000-E	460	1'-**"X *****" CONCRETE PARA- PET	504.55		
			(1'-2" X 2'-6")	LF		
0390	8531000000-E	462	4" SLOPE PROTECTION	2,278		
				SY		
0391	8657000000-N		ELASTOMERIC BEARINGS	Lump Sum		

0946/Dec14/Q8058575.367/D1777759787010/E402

Total Amount Of Bid For Entire Project :

HIGHWAY LETTING

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

RALEIGH N.C.

DECEMBER 21, 2021 DIVISION 00013

C204397 34400.3.4 STATE FUNDED RUTHERFORD

R-2233BB

Advertised DBE Goal: 8.0% DBE Participation Submitted: 8.0%

PROPOSAL LENGTH 5.164 MILES

TYPE OF WORK GRADING, DRAINAGE, PAVING, SIGNALS, AND STRUCTURES.

LOCATION US-221 SOUTH OF US-74 BUS (CHARLOTTE RD) TO NORTH OF SR-1366 (ROPER LOOP RD).

EST CONST PROGRESS.... FY-2022...13% OF BID

FY-2023..25% OF BID FY-2024..23% OF BID FY-2025..21% OF BID FY-2026..15% OF BID FY-2027..03% OF BID

RPN 002 2 BIDDER(S) DBE GOAL 9.00 %

ESTIMATE 114,307,404.04

PAGE: 8 of 11

ITEM C

DATE AVAILABLE FEB 01 2022

INTER COMPLETION NOV 15 2026 COMPLETE ALL WORK EXCEPT PLANTING, REFORESTATION OR

PERMANENT VEGETATION ESTABLISHMENT

MAY 01 2022 COMPLETE CLEARING, GRUBBING & GRADING OPERATIONS ALONG -Y2-

AND -L3- (FROM STA. 811+00 +/- TO STA. 812+00 +/-)

FINAL COMPLETION MAY 14 2027

\$ TOTALS % DIFF WRIGHT BROTHERS CONSTRUCTION COMPANY INC CHARLESTON, TN 109,237,300.02 -4.4

BLYTHE DEVELOPMENT CO CHARLOTTE, NC 116,494,541.10 +1.9

Vendor 1 of 2: WRIGHT BROTHERS CONSTRUCTION COMPANY INC (3762)

Call Order 002 (Proposal: C204397)

Bid Information

Proposal County: RUTHERFORD **Bid Checksum:** 310BBD21E1

Vendor Address:Bid Total:\$109,237,300.02Signature Check:Stephen Daryl WrightItems Total:\$109,237,300.02

Amendment Count: 3

Bidding Errors:

None.

NCDOT Page 9 of 81

Contract ID: C204397 Call: 002

DBE Load Information

Letting ID: L211221

Letting Date: 12/21/2021

Call Order: 002

Contract ID: C204397

Project: STATE FUNDEDSTATE FUNDEDSTATE FUNDED

Bid Total: \$116,494,541.10

DBE Goal: 9.00% (\$10,484,508.70)

Vendor ID: 3740

Vendor Name: Blythe Development Co. DBE Entered: 9.02% (\$10,513,464.05)

Vendor ID	DBE Name	Is Supplier?	City/State	Goods/Service	Amount
5534	HIGH COUNTRY HYDROSEEDING INC	False	276 SWEETWATER DRIVE , CANTON, NC 28716	SubContractor	5,024,863.75
10129	CONCRETE SPECIALTY CONTRACTORS IN	C False	POST OFFICE BOX 2303 , SHELBY, NC 28151	SubContractor	1,892,212.50
4761	TRAFFIC CONTROL SAFETY SERVICES INC.	,False	POST OFFICE BOX 24511 , WINSTON-SALEM, NC 27114	SubContractor	425,000.00
4417	POZZOLANIC CONTRACTING & SUPPLY CINC	COFalse	2401 ASBURY ROAD , KNOXVILLE, TN 379146408	SubContractor	1,268,079.00
4247	SEAL BROTHERS CONTRACTING LLC	False	131 W. CLEVE STREET , MOUNT AIRY, NC 27030	SubContractor	619,295.00
11816	MARTINEZ COMPANY INC	False	342 FLEMING DRIVE , DURHAM, NC 27712	SubContractor	1,284,013.80

Errors: No Page 2 North Carolina Department of Transportation 3762 - Wright Brothers Construction Company, Inc

Letting: L211221 12/21/2021 02:00:00 PM

BondID: SNC21558525

Surety Registry Agency: Surety2000

Verified?: 1

Surety Agency: Liberty Mutual North Carolina Bond Execution Date: 12/17/2021 03:58:11 PM

Errors: No Check: 310BBD21E1
Page 11 Amendment Count: 3

Contract ID: C204397

Call: 002

Line Number	Item Number	Quantity	Unit	Unit Price	Extension Price
Section 0001					
	MS - NPAR (BROAD RIVER	<u>_</u>			
0001	0000100000-N MOBILIZATION	1.000	LS	\$5,460,000.0000	\$5,460,000.00
0002	0000400000-N CONSTRUCTION	1.000 I SURVEYING	LS	\$1,803,000.0000	\$1,803,000.00
0003	0001000000-E CLEARING & G	1.000 GRUBBING ACRE(S	_	\$5,057,110.0000	\$5,057,110.00
0004	0008000000-E SUPPLEMENTAR	5.000 RY CLEARING & GRUE		\$8,450.0000	\$42,250.00
0005	0015000000-N SEALING ABAN	3.000 IDONED WELLS	EA	\$3,300.0000	\$9,900.00
0006	0022000000-E UNCLASSIFIED		CY	\$5.3000	\$15,158,000.00
0007	0028000000-N TYPE I STAND	1.000 DARD APPROACH FILI		\$43,500.0000 ******* (20+88.94 -Y19-	\$43,500.00
0008	0028000000-N TYPE I STAND			\$67,600.0000 ******* (26+65.52 -Y3-)	
0009	0029000000-N TYPE III REI			\$93,000.0000 FION ****** (774+41.49 -	•
0010	0029000000-N TYPE III REI	1.000 NFORCED APPROACH		\$93,000.0000 FION ****** (774+41.49 -	• •
0011	0036000000-E UNDERCUT EXC	13500.000		\$9.9500	
0012	0134000000-E DRAINAGE DIT	25650.000	CY	\$7.0000	\$179,550.00
0013	0141000000-E BERM DITCH C	1810.000	LF	\$5.9000	\$10,679.00
0014	0156000000-E REMOVAL OF E	47600.000 EXISTING ASPHALT		\$3.7500	\$178,500.00
0015	0163000000-E REMOVAL OF E	3400.000 EXISTING CONCRETE		\$11.2500	\$38,250.00
0016	0177000000-E BREAKING OF	7500.000 EXISTING ASPHALT		\$2.0000	\$15,000.00
0017	0192000000-N PROOF ROLLIN	100.000	HR	\$248.0000	\$24,800.00
0018	0195000000-E SELECT GRANU	11500.000 JLAR MATERIAL	CY	\$63.5000	\$730,250.00
0019	0196000000-E GEOTEXTILE F	53500.000 OR SOIL STABILIZA		\$2.2500	\$120,375.00
0020	0255000000-E GENERIC GRAD	100.000 DING ITEM HAULING		\$102.0000 AL OF PETRO- LEUM CONTAMI	\$10,200.00 NATED SOIL
0021	0318000000-E FOUNDATION C	8218.000 CONDITIONING MATE-		\$38.1000 DR STRUCTURES	\$313,105.80
0022	0320000000-E FOUNDATION C	25834.000 CONDITIONING GEO-		\$3.8000	\$98,169.20
0023	0335200000-E 15" DRAINAGE	2484.000	LF	\$57.0000	\$141,588.00

Letting: L211221 12/21/2021 02:00:00 P	North Carolina Department of Transportation 3762 - Wright Brothers Construction Company, Inc	Contract ID: C204397 Call: 002	
0024	0335300000-E 1796.000 LF 18" DRAINAGE PIPE	\$67.0000	\$120,332.00
0025	0335400000-E 1328.000 LF 24" DRAINAGE PIPE	\$86.7500	\$115,204.00
0026	0335500000-E 1036.000 LF 30" DRAINAGE PIPE	\$132.0000	\$136,752.00
0027	0335600000-E 264.000 LF 36" DRAINAGE PIPE	\$129.0000	\$34,056.00
0028	0335700000-E 32.000 LF 42" DRAINAGE PIPE	\$179.0000	\$5,728.00
0029	0354000000-E 352.000 LF ***" RC PIPE CULVERTS, CLASS ***** (54", V)	\$488.0000	\$171,776.00
0030	0366000000-E 14496.000 LF 15" RC PIPE CULVERTS, CLASS III	\$59.7500	\$866,136.00
0031	0372000000-E 6076.000 LF 18" RC PIPE CULVERTS, CLASS III	\$64.7500	\$393,421.00
0032	0378000000-E 4800.000 LF 24" RC PIPE CULVERTS, CLASS III	\$81.2500	\$390,000.00
0033	0384000000-E 3316.000 LF 30" RC PIPE CULVERTS, CLASS III	\$108.0000	\$358,128.00
0034	0390000000-E 1700.000 LF 36" RC PIPE CULVERTS, CLASS III	\$129.0000	\$219,300.00
0035	0396000000-E 1256.000 LF 42" RC PIPE CULVERTS, CLASS III	\$164.0000	\$205,984.00
0036	0402000000-E 544.000 LF 48" RC PIPE CULVERTS, CLASS III	\$212.0000	\$115,328.00
0037	0408000000-E 836.000 LF 54" RC PIPE CULVERTS, CLASS III	\$372.0000	\$310,992.00
0038	0426000000-E 24.000 LF 72" RC PIPE CULVERTS, CLASS III	\$650.0000	\$15,600.00
0039	0448300000-E 172.000 LF 18" RC PIPE CULVERTS, CLASS IV	\$75.2500	\$12,943.00
0040	0448500000-E 272.000 LF 30" RC PIPE CULVERTS, CLASS IV	\$124.0000	\$33,728.00
0041	0448600000-E 36.000 LF 36" RC PIPE CULVERTS, CLASS IV	\$170.0000	\$6,120.00
0042	0536000000-E 44.000 LF ***" HDPE PIPE CULVERTS (8")	\$74.7500	\$3,289.00
0043	0576000000-E 672.000 LF **" CS PIPE CULVERTS, ***** THICK (36", 0.079")	\$198.0000	\$133,056.00
0044	0576000000-E 588.000 LF **" CS PIPE CULVERTS, ***** THICK (42", 0.109")	\$275.0000	\$161,700.00
0045	0576000000-E 56.000 LF **" CS PIPE CULVERTS, ***** THICK (60", 0.138")	\$530.0000	\$29,680.00
0046	0582000000-E 2012.000 LF 15" CS PIPE CULVERTS, 0.064" THICK	\$114.0000	\$229,368.00
0047	0588000000-E 2360.000 LF 18" CS PIPE CULVERTS, 0.064" THICK	\$115.0000	\$271,400.00
0048	0594000000-E 784.000 LF	\$137.0000	\$107,408.00

	24" CS PIPE CULVERTS, 0.064" THICK		
0049	060000000-E 648.000 LF 30" CS PIPE CULVERTS, 0.079" THICK	\$166.0000	\$107,568.00
0050	0636000000-E 16.000 EA **" CS PIPE ELBOWS, *****" THICK (15", 0.		\$12,480.00
0051	0636000000-E 14.000 EA **" CS PIPE ELBOWS, *****" THICK (18". 0.	\$910.0000 064")	\$12,740.00
0052	0973100000-E 276.000 LF **" WELDED STEEL PIPE, ****" THICK, GRADE B	\$960.0000 3 IN SOIL (42", 0.625")	\$264,960.00
0053	0973100000-E 122.000 LF **" WELDED STEEL PIPE, ****" THICK, GRADE B	\$2,040.0000 B IN SOIL (66", 0.875")	
0054	0973300000-E 346.000 LF **" WELDED STEEL PIPE, ****" THICK, GRADE B	\$2,150.0000 B NOT IN SOIL (36", 0.5	•
0055	0995000000-E 4702.000 LF PIPE REMOVAL	\$30.2000	\$142,000.40
0056	0996000000-N 4.000 EA PIPE CLEAN OUT	\$1,550.0000	\$6,200.00
0057	100000000-E 310.000 SY 6" SLOPE PROTECTION	\$108.0000	\$33,480.00
0058	1011000000-N 1.000 LS FINE GRADING	\$1,000,000.0000	\$1,000,000.00
0059	104400000-E 184940.000 SY LIME TREATED SOIL (SLURRY METHOD)	\$3.3500	\$619,549.00
0060	1066000000-E 2220.000 TON LIME FOR LIME TREATED SOIL	\$279.0000	\$619,380.00
0061	1099500000-E 15000.000 CY SHALLOW UNDERCUT	\$25.0000	\$375,000.00
0062	1099700000-E 39800.000 TON CLASS IV SUBGRADE STABILIZA- TION	\$28.1000	\$1,118,380.00
0063	1110000000-E 1500.000 TON STABILIZER AGGREGATE	\$38.7000	\$58,050.00
0064	1115000000-E 129200.000 SY GEOTEXTILE FOR PAVEMENT STA- BILIZATION	\$4.2500	\$549,100.00
0065	1121000000-E 92300.000 TON AGGREGATE BASE COURSE	\$30.7000	\$2,833,610.00
0066	1176000000-E 184940.000 SY SOIL CEMENT BASE	\$3.3500	\$619,549.00
0067	1187000000-E 5179.000 TON PORTLAND CEMENT FOR SOIL CE- MENT BASE	\$240.0000	\$1,242,960.00
0068	1209000000-E 55490.000 GAL ASPHALT CURING SEAL	\$2.7500	\$152,597.50
0069	1220000000-E 10000.000 TON INCIDENTAL STONE BASE	\$36.1000	\$361,000.00
0070	1231000000-E 38000.000 CY SHOULDER BORROW	\$13.0000	\$494,000.00
0071	1275000000-E 180.000 GAL PRIME COAT	\$5.5000	\$990.00
0072	1297000000-E 6870.000 SY MILLING ASPHALT PAVEMENT, ***"DEPTH (1-1/2")	\$9.3500	\$64,234.50

Contract ID: C204397 Letting: L211221 North Carolina Department of Transportation 12/21/2021 02:00:00 PM 3762 - Wright Brothers Construction Company, Inc Call: 002 1308000000-E 6200.000 SY \$12.3500 \$76,570.00 0073 MILLING ASPHALT PAVEMENT, ***"TO *****" (0" TO 3") \$23.7500 0074 1330000000-E 3450.000 SY \$81,937.50 INCIDENTAL MILLING 0075 1491000000-E 28717.000 TON \$72.2500 \$2,074,803.25 ASPHALT CONC BASE COURSE, TYPE B25.0C 0076 1503000000-E 43600.000 TON \$76.0000 \$3,313,600.00 ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C 0077 1519000000-E 22774.000 TON \$85.5000 \$1,947,177.00 ASPHALT CONC SURFACE COURSE, TYPE S9.5B 0078 1523000000-E 34220.000 TON \$70.2500 \$2,403,955.00 ASPHALT CONC SURFACE COURSE, TYPE S9.5C 0079 1575000000-E 6960.000 \$805.0000 \$5,602,800.00 ASPHALT BINDER FOR PLANT MIX \$197,000.00 0080 1693000000-E 1000.000 \$197.0000 TON ASPHALT PLANT MIX, PAVEMENT REPATR 0081 184000000-E 92000.000 LF \$0.1500 \$13,800.00 MILLED RUMBLE STRIPS (ASPHALT CONCRETE) 1891000000-E 590.000 SY \$110.0000 \$64,900.00 0082 GENERIC PAVING ITEM 7" CONCRETE TRUCK APRON 0083 2000000000-N 575.000 EA \$420.0000 \$241,500.00 RIGHT-OF-WAY MARKERS 2022000000-E 0084 1344.000 CY \$11.5500 \$15,523.20 SUBDRAIN EXCAVATION 2026000000-E 0085 2000.000 SY \$4.6500 \$9,300.00 GEOTEXTILE FOR SUBSURFACE DRAINS 0086 2033000000-E 336.000 CY \$71.0000 \$23,856.00 SUBDRAIN FINE AGGREGATE 2036000000-E 0087 336.000 CY \$69.2500 \$23,268.00 SUBDRAIN COARSE AGGREGATE 0088 2044000000-E 4000.000 LF \$12.8000 \$51,200.00 6" PERFORATED SUBDRAIN PIPE 0089 2070000000-N 8.000 EA \$730.0000 \$5,840.00 SUBDRAIN PIPE OUTLET 0090 2077000000-E 48.000 LF \$71.5000 \$3,432.00 6" OUTLET PIPE 2099000000-E 20800.000 LF \$9.7000 \$201,760.00 0091 SHOULDER DRAIN 0092 2110000000-E 20832.000 LF \$1.7500 \$36,456.00 4" SHOULDER DRAIN PIPE 0093 2121000000-E 2036.000 LF \$14.7000 \$29,929.20 4" OUTLET PIPE FOR SHOULDER DRAINS 2132000000-N \$13,640.00 0094 40.000 \$341.0000 CONCRETE PAD FOR SHOULDER DRAIN PIPE OUTLET 0095 2143000000-E 20.000 TON \$82.7500 \$1,655.00 BLOTTING SAND 0096 2209000000-E 41.400 CY \$1,770.0000 \$73,278.00 ENDWALLS 0097 2220000000-E 24.300 CY \$2,080.0000 \$50,544.00

> Errors: No Page 5

Contract ID: C204397 Call: 002

	REINFORCED ENDWALLS		
0098	2253000000-E 6.413 PIPE COLLARS	CY \$2,260.0000	\$14,493.38
0099	2264000000-E 1.504 PIPE PLUGS	CY \$2,260.0000	\$3,399.04
0100	2275000000-E 137.000 FLOWABLE FILL	CY \$413.0000	\$56,581.00
0101	2286000000-N 435.000 MASONRY DRAINAGE STRUCTURES	EA \$3,520.0000	\$1,531,200.00
0102	2297000000-E 24.720 MASONRY DRAINAGE STRUCTURES	CY \$2,230.0000	\$55,125.60
0103	2308000000-E 546.700 MASONRY DRAINAGE STRUCTURES	LF \$560.0000	\$306,152.00
0104	2364000000-N 54.000 FRAME WITH TWO GRATES, STD		\$51,840.00
0105	2364200000-N 41.000 FRAME WITH TWO GRATES, STD		\$39,360.00
0106	2365000000-N 172.000 FRAME WITH TWO GRATES, STD		\$165,120.00
0107	2366000000-N 7.000 FRAME WITH TWO GRATES, STD		\$6,720.00
0108	2367000000-N 1.000 FRAME WITH TWO GRATES, STD		\$960.00
0109	2374000000-N 7.000 FRAME WITH GRATE & HOOD, STD		\$6,720.00
0110	2374000000-N 42.000 FRAME WITH GRATE & HOOD, STD		\$40,320.00
0111	2374000000-N 31.000 FRAME WITH GRATE & HOOD, STD		\$29,760.00
0112	2396000000-N 41.000 FRAME WITH COVER, STD 840.54	·	\$39,360.00
0113	2407000000-N 15.000 STEEL FRAME WITH TWO GRATES,	, ,	\$18,600.00
0114	2451000000-N 34.000 CONCRETE TRANSITIONAL SECTION		\$49,640.00
0115	2462000000-E 2.000 **" SLUICE GATE (8")	EA \$3,080.0000	\$6,160.00
0116	2473000000-N 17.000 GENERIC DRAINAGE ITEM ENERGY	. ,	\$246,500.00
0117	2535000000-E 230.000 **"X **" CONCRETE CURB (8" X	·	\$6,739.00
0118	2549000000-E 18400.000 2'-6" CONCRETE CURB & GUTTER	•	\$552,000.00
0119	2556000000-E 5310.000 SHOULDER BERM GUTTER	LF \$38.9000	\$206,559.00
0120	2577000000-E 750.000 CONCRETE EXPRESSWAY GUTTER	LF \$45.6000	\$34,200.00
0121	2591000000-E 5480.000 4" CONCRETE SIDEWALK	SY \$54.0000	\$295,920.00

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Letting: L211221 12/21/2021 02:00:00 PM

North Carolina Department of Transportation 3762 - Wright Brothers Construction Company, Inc

Contract ID: C204397 Call: 002

12/21/2021 02:00:	00 PM 3762 - Wright Brothers Construction Company, I	3762 - Wright Brothers Construction Company, Inc				
0122	2605000000-N 6.000 EA CONCRETE CURB RAMPS	\$2,250.0000	\$13,500.00			
0123	2612000000-E 560.000 SY 6" CONCRETE DRIVEWAY	\$78.7500	\$44,100.00			
0124	261900000-E 177.000 SY 4" CONCRETE PAVED DITCH	\$90.0000	\$15,930.00			
0125	2647000000-E 8850.000 SY 5" MONOLITHIC CONCRETE ISLANDS (SURFACE MOUNTED	\$73.0000)	\$646,050.00			
0126	2655000000-E 490.000 SY 5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)	\$74.7500	\$36,627.50			
0127	270300000-E 655.000 LF CONCRETE BARRIER, TYPE ****** (SINGLE SLOPE)	\$145.0000	\$94,975.00			
0128	272400000-E 5350.000 LF PRECAST REINFORCED CONCRETE BARRIER, SINGLE	\$102.0000 FACED	\$545,700.00			
0129	2752000000-E 360.000 LF GENERIC PAVING ITEM 2'-0" MODIFIED VALLEY GUTT		\$20,250.00			
0130	2759000000-N 2.000 EA GENERIC PAVING ITEM VERTICAL CONCRETE BARRIER	\$5,710.0000 TRANSITION	\$11,420.00			
0131	3001000000-N 2.000 EA IMPACT ATTENUATOR UNITS, TYPE TL-3	\$8,130.0000	\$16,260.00			
0132	303000000-E 29500.000 LF STEEL BEAM GUARDRAIL	\$26.9000	\$793,550.00			
0133	3045000000-E 1475.000 LF STEEL BEAM GUARDRAIL, SHOP CURVED	\$28.6000	\$42,185.00			
0134	3150000000-N 30.000 EA ADDITIONAL GUARDRAIL POSTS	\$61.7500	\$1,852.50			
0135	3195000000-N 9.000 EA GUARDRAIL END UNITS, TYPE AT-1	\$1,010.0000	\$9,090.00			
0136	321000000-N 23.000 EA GUARDRAIL END UNITS, TYPE CAT-1	\$1,040.0000	\$23,920.00			
0137	3215000000-N 4.000 EA GUARDRAIL ANCHOR UNITS, TYPE III	\$2,470.0000	\$9,880.00			
0138	3287000000-N 44.000 EA GUARDRAIL END UNITS, TYPE TL-3	\$3,900.0000	\$171,600.00			
0139	3288000000-N 23.000 EA GUARDRAIL END UNITS, TYPE TL-2	\$1,040.0000	\$23,920.00			
0140	3317000000-N 20.000 EA GUARDRAIL ANCHOR UNITS, TYPE B-77	\$2,750.0000	\$55,000.00			
0141	336000000-E 7400.000 LF REMOVE EXISTING GUARDRAIL	\$1.1000	\$8,140.00			
0142	3380000000-E 500.000 LF TEMPORARY STEEL BEAM GUARDRAIL	\$7.8500	\$3,925.00			
0143	3389150000-N 2.000 EA TEMPORARY GUARDRAIL END UNITS, TYPE ***** (TL-	\$2,470.0000	\$4,940.00			
0144	3389400000-E 13200.000 LF DOUBLE FACED CABLE GUIDERAIL	\$11.1500	\$147,180.00			
0145	3389500000-N 10.000 EA ADDITIONAL GUIDERAIL POSTS	\$86.2500	\$862.50			
0146	3389600000-N 40.000 EA	\$1,850.0000	\$74,000.00			

Errors: No Page 7

North Carolina Department of Transportation 3762 - Wright Brothers Construction Company, Inc

Contract ID: C204397 Call: 002

	CABLE GUIDERAIL ANCHOR UNITS	
0147	3435000000-N 6.000 EA \$500.0000 GENERIC GUARDRAIL ITEM PERMANENT BOLLARDS	\$3,000.00
0148	3435000000-N 3.000 EA \$1,060.0000 GENERIC GUARDRAIL ITEM REMOVABLE BOLLARDS	\$3,180.00
0149	3503000000-E 60960.000 LF \$3.1000 WOVEN WIRE FENCE, 47" FABRIC	\$188,976.00
0150	3509000000-E 3730.000 EA \$22.4000 4" TIMBER FENCE POSTS, 7'-6" LONG	\$83,552.00
0151	3515000000-E 1170.000 EA \$33.6000 5" TIMBER FENCE POSTS, 8'-0" LONG	\$39,312.00
0152	3565000000-E 1.000 EA \$2,020.0000 DOUBLE GATES, **" HIGH, **' WIDE, **' OPENING (47", 8', 16')	\$2,020.00
0153	3575000000-E 810.000 LF \$170.0000 GENERIC FENCING ITEM BIKE AND PEDESTRIAN SAFETY RAIL	\$137,700.00
0154	3628000000-E 3500.000 TON \$58.0000 RIP RAP, CLASS I	\$203,000.00
0155	3635000000-E 6625.000 TON \$60.0000 RIP RAP, CLASS II	\$397,500.00
0156	3649000000-E 6465.000 TON \$45.8000 RIP RAP, CLASS B	\$296,097.00
0157	3656000000-E 44475.000 SY \$5.1000 GEOTEXTILE FOR DRAINAGE	\$226,822.50
0158	4048000000-E 12.000 CY \$1,140.0000 REINFORCED CONCRETE SIGN FOUN-DATIONS	\$13,680.00
0159	4054000000-E 2.000 CY \$11.4000 PLAIN CONCRETE SIGN FOUNDA- TIONS	\$22.80
0160	4057000000-E 30.000 CY \$11.4000 OVERHEAD FOOTING	\$342.00
0161	4060000000-E 4817.000 LB \$9.1000 SUPPORTS, BREAKAWAY STEEL BEAM	\$43,834.70
0162	4066000000-E 6948.000 LB \$9.1000 SUPPORTS, SIMPLE STEEL BEAM	\$63,226.80
0163	4072000000-E 6280.000 LF \$9.1000 SUPPORTS, 3-LB STEEL U-CHANNEL	\$57,148.00
0164	4078000000-E 10.000 EA \$114.0000 SUPPORTS, 2-LB STEEL U-CHANNEL	\$1,140.00
0165	4082100000-N 1.000 LS \$204,900.0000 SUPPORTS, OVERHEAD SIGN STRUC-TURE AT STA ****** (861+15 -L3-)	\$204,900.00
0166	4096000000-N 5.000 EA \$171.0000 SIGN ERECTION, TYPE D	\$855.00
0167	4102000000-N 339.000 EA \$85.2500 SIGN ERECTION, TYPE E	\$28,899.75
0168	4108000000-N 73.000 EA \$171.0000 SIGN ERECTION, TYPE F	\$12,483.00
0169	4109000000-N 3.000 EA \$1.1500 SIGN ERECTION, TYPE *** (OVER-HEAD) (A)	\$3.45
0170	4109000000-N 2.000 EA \$1.1500 SIGN ERECTION, TYPE *** (OVER-HEAD) (B)	\$2.30

Errors: No Page 8

Letting: L211221 12/21/2021 02:00:00 PM

North Carolina Department of Transportation 3762 - Wright Brothers Construction Company, Inc

Contract ID: C204397 Call: 002

12/21/2021 02:00:00 PN	l 3/62 - Wright	Brothers (Construction Company, Inc		Call: 002
0171		18.000	EA (GROUND MOUNTED) (A)		\$16,380.00
0172		* *	(GROUND MOUNTED) (B)		\$4,095.00
0173	4114000000-N SIGN ERECTION, MILEMA	RKERS		\$171.0000	\$1,539.00
0174	4116100000-N SIGN ERECTION, RELOCA		EA **** (GROUND MOUNTED)		\$684.00
0175	4116100000-N SIGN ERECTION, RELOCA		EA **** (GROUND MOUNTED)	\$228.0000 (E)	\$684.00
0176	4116100000-N SIGN ERECTION, RELOCA		EA **** (GROUND MOUNTED)	\$228.0000 (F)	\$456.00
0177	4155000000-N DISPOSAL OF SIGN SYST	EM, U-	CHANNEL	\$2.3000	\$213.90
0178	4192000000-N DISPOSAL OF SUPPORT,			\$2.3000	\$9.20
0179	4238000000-N DISPOSAL OF SIGN, D,			\$2.3000	\$27.60
0180	4370000000-N GENERIC SIGNING ITEM			\$1,600.0000	\$1,600.00
0181	4400000000-E 19 WORK ZONE SIGNS (STAT			\$7.7000	\$14,676.20
0182	4405000000-E 6 WORK ZONE SIGNS (PORT		SF	\$29.3000	\$19,689.60
0183	4410000000-E 4 WORK ZONE SIGNS (BARR			\$6.9500	\$3,002.40
0184	4415000000-N FLASHING ARROW BOARD		EA S	3,310.0000	\$6,620.00
0185	4420000000-N PORTABLE CHANGEABLE M		·	13,800.0000	\$27,600.00
0186	443000000-N 9 DRUMS	20.000	EA	\$54.2500	\$49,910.00
0187	4434000000-N SEQUENTIAL FLASHING W	30.000 ARNING	EA LIGHTS	\$148.0000	\$4,440.00
0188	4435000000-N CONES	50.000	EA	\$23.6000	\$1,180.00
0189	4445000000-E 3 BARRICADES (TYPE III)	52.000	LF	\$28.4000	\$9,996.80
0190	4447000000-E 1 PEDESTRIAN CHANNELIZI	28.000 NG DE-	LF VICES	\$39.0000	\$4,992.00
0191	4455000000-N 5 FLAGGER	50.000	DAY	\$385.0000	\$211,750.00
0192	4465000000-N TEMPORARY CRASH CUSHI	2.000 ONS	EA	\$6,480.0000	\$12,960.00
0193	4470000000-N REMOVE & RESET TEMPOR	2.000 ARY CRA		3,300.0000	\$6,600.00
0194	4480000000-N TMA	2.000	EA \$4	18,400.0000	\$96,800.00
0195	4485000000-E 18	00.000	LF	\$38.7000	\$69,660.00

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	PORTABLE CONCRETE BARRIER		
0196	450000000-E 1800.000 LF REMOVE AND RESET PORTABLE CON-CRETE BARRIER	\$6.9000	\$12,420.00
0197	4507000000-E 700.000 LF WATER FILLED BARRIER	\$92.5000	\$64,750.00
0198	4508000000-E 700.000 LF REMOVE AND RESET WATER FILLED BARRIER	\$17.5500	\$12,285.00
0199	4510000000-N 64.000 HR LAW ENFORCEMENT	\$66.2500	\$4,240.00
0200	4516000000-N 110.000 EA SKINNY DRUM	\$40.2000	\$4,422.00
0201	4520000000-N 68.000 EA TUBULAR MARKERS (FIXED)	\$75.0000	\$5,100.00
0202	4650000000-N 1618.000 EA TEMPORARY RAISED PAVEMENT MARKERS	\$8.8500	\$14,319.30
0203	4695000000-E 1687.000 LF THERMOPLASTIC PAVEMENT MARKINGLINES (8", 90 MILS	\$1.7500	\$2,952.25
0204	4720000000-E 26.000 EA THERMOPLASTIC PAVEMENT MARKINGCHARACTER (90 MILS	\$154.0000	\$4,004.00
0205	4725000000-E 223.000 EA THERMOPLASTIC PAVEMENT MARKINGSYMBOL (90 MILS)	\$191.0000	\$42,593.00
0206	4770000000-E 1960.000 LF COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYP	\$7.1500 E ** (4") (IV)	\$14,014.00
0207	4775000000-E 302.000 LF COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYP	\$8.8500 E ** (6") (IV)	\$2,672.70
0208	4805000000-N 2.000 EA COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TY	\$1,410.0000 PE ** (I)	\$2,820.00
0209	4810000000-E 296225.000 LF PAINT PAVEMENT MARKING LINES (4")	\$0.2500	\$74,056.25
0210	4815000000-E 23546.000 LF PAINT PAVEMENT MARKING LINES (6")	\$0.2500	\$5,886.50
0211	4820000000-E 1400.000 LF PAINT PAVEMENT MARKING LINES (8")	\$1.2000	\$1,680.00
0212	4825000000-E 576.000 LF PAINT PAVEMENT MARKING LINES (12")	\$2.0500	\$1,180.80
0213	4835000000-E 770.000 LF PAINT PAVEMENT MARKING LINES (24")	\$1.7000	\$1,309.00
0214	4845000000-N 76.000 EA PAINT PAVEMENT MARKING SYMBOL	\$71.0000	\$5,396.00
0215	4850000000-E 32600.000 LF REMOVAL OF PAVEMENT MARKING LINES (4")	\$1.3500	\$44,010.00
0216	4860000000-E 400.000 LF REMOVAL OF PAVEMENT MARKING LINES (8")	\$2.9500	\$1,180.00
0217	4870000000-E 110.000 LF REMOVAL OF PAVEMENT MARKING LINES (24")	\$11.2500	\$1,237.50
0218	4875000000-N 12.000 EA REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTE	\$106.0000 RS	\$1,272.00
0219	489000000-E 10194.000 LF GENERIC PAVEMENT MARKING ITEM POLYUREA PAVEMENT		\$23,955.90

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	(STANDARD GLASS	BEADS)					
0220	4890000000-E GENERIC PAVEMENT (STANDARD GLASS	MARKING IT					
0221	4890000000-E GENERIC PAVEMENT (STANDARD GLASS	MARKING IT					\$101,307.60 6", 20 MILS
0222	4890000000-E GENERIC PAVEMENT (STANDARD GLASS	MARKING IT		PAVEMENT			\$5,993.00 8", 20 MILS
0223	4891000000-E GENERIC PAVEMEN' MILS)			PLASTIC P.			\$2,537.00 ES (24", 90
0224	4895000000-N GENERIC PAVEMENT	1606.000 MARKING ITE		IRON SNOW			\$85,519.50 RKER
0225	4900000000-N PERMANENT RAISED				\$29.60	00	\$236.80
0226	4915000000-E 7' U-CHANNEL POS		EA		\$74.00	00	\$3,552.00
0227	4955000000-N OBJECT MARKERS (\$96.75	00	\$5,224.50
0228	5325200000-E 2" WATER LINE	1350.000	LF		\$67.00	00	\$90,450.00
0229	5325600000-E 6" WATER LINE	2515.000	LF		\$120.00	00	\$301,800.00
0230	5325800000-E 8" WATER LINE	960.000	LF		\$116.00	00	\$111,360.00
0231	5326000000-E 10" WATER LINE		LF		\$120.00	00	\$694,800.00
0232	5326200000-E 12" WATER LINE		LF		\$139.00	00	\$435,070.00
0233	5329000000-E DUCTILE IRON WAT				\$7.70	00	\$64,287.30
0234	5536000000-E 2" VALVE	5.000	EA		\$1,500.00	00	\$7,500.00
0235	5540000000-E 6" VALVE	35.000	EA		\$2,060.00	00	\$72,100.00
0236	5546000000-E 8" VALVE	4.000	EA		\$2,870.00	00	\$11,480.00
0237	5552000000-E 10" VALVE	22.000	EA		\$4,250.00	00	\$93,500.00
0238	5558000000-E 12" VALVE	6.000	EA		\$5,370.00	00	\$32,220.00
0240	5571600000-E 6" TAPPING SLEEV	1.000 YE & VALVE	EA		\$9,250.00	00	\$9,250.00
0241	5606000000-E 2" BLOW OFF	5.000	EA		\$2,510.00	00	\$12,550.00
0242	5648000000-N RELOCATE WATER M	9.000 METER	EA		\$1,110.00	00	\$9,990.00
0243	5649000000-N	12.000	EA		\$1,280.00	00	\$15,360.00

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	RECONNECT WATER METER			
0244	5666000000-N 2.000 FIRE HYDRANT	EA	\$5,010.0000	\$10,020.00
0245	5672000000-N 15.000 RELOCATE FIRE HYDRANT	EA	\$780.0000	\$11,700.00
0246	5691300000-E 7698.230 8" SANITARY GRAVITY SEWER	LF	\$214.0000	\$1,647,421.22
0247	5691400000-E 1888.100 10" SANITARY GRAVITY SEWER	LF	\$230.0000	\$434,263.00
0248	5691500000-E 1337.250 12" SANITARY GRAVITY SEWER	LF	\$260.0000	\$347,685.00
0249	5709200000-E 3117.000 4" FORCE MAIN SEWER	LF	\$356.0000	\$1,109,652.00
0250	5709400000-E 310.000 8" FORCE MAIN SEWER	LF	\$530.0000	\$164,300.00
0251	5775000000-E 43.000 4' DIA UTILITY MANHOLE	EA	\$4,500.0000	\$193,500.00
0252	5801000000-E 4983.800 ABANDON 8" UTILITY PIPE	LF	\$18.4000	\$91,701.92
0253	5802000000-E 4827.000 ABANDON 10" UTILITY PIPE	LF	\$17.7500	\$85,679.25
0254	5804000000-E 584.000 ABANDON 12" UTILITY PIPE	LF	\$21.7000	\$12,672.80
0255	5815000000-N 26.000 REMOVE WATER METER	EA	\$271.0000	\$7,046.00
0256	5835700000-E 270.000 16" ENCASEMENT PIPE	LF	\$250.0000	\$67,500.00
0257	5835800000-E 1468.000 18" ENCASEMENT PIPE	LF	\$309.0000	\$453,612.00
0258	5836000000-E 1386.000 24" ENCASEMENT PIPE	LF	\$332.0000	\$460,152.00
0259	600000000-E 143000.000 TEMPORARY SILT FENCE	LF	\$3.0000	\$429,000.00
0260	6006000000-E 8860.000 STONE FOR EROSION CONTROL,		\$46.0000	\$407,560.00
0261	6009000000-E 40810.000 STONE FOR EROSION CONTROL,		\$45.0000	\$1,836,450.00
0262	6012000000-E 19350.000 SEDIMENT CONTROL STONE	TON	\$44.3000	\$857,205.00
0263	6015000000-E 711.000 TEMPORARY MULCHING	ACR	\$970.0000	\$689,670.00
0264	6018000000-E 27700.000 SEED FOR TEMPORARY SEEDING	LB	\$3.6000	\$99,720.00
0265	6021000000-E 141.500 FERTILIZER FOR TEMPORARY SEE		\$2,010.0000	\$284,415.00
0266	6024000000-E 28125.000 TEMPORARY SLOPE DRAINS	LF	\$16.8000	\$472,500.00
0267	6029000000-E 11320.000 SAFETY FENCE	LF	\$2.2000	\$24,904.00

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0268	6030000000-E SILT EXCAV		СУ	\$0.0100	\$2,507.50
0269	6036000000-E MATTING FO	892500.000 OR EROSION CONTROL	SY	\$1.4500	\$1,294,125.00
0270	6037000000-E COIR FIBER	2640.000 R MAT	SY	\$8.0500	\$21,252.00
0271	6038000000-E PERMANENT	32000.000 SOIL REINFORCEMENT		\$4.1000	\$131,200.00
0272	6042000000-E 1/4" HARDW	22655.000 JARE CLOTH	LF	\$7.5000	\$169,912.50
0273	6045000000-E **" TEMPOR	135.000 RARY PIPE (36")	LF	\$193.0000	\$26,055.00
0274	6046000000-E TEMPORARY	125.000 PIPE FOR STREAM	LF CROSSING	\$85.5000	\$10,687.50
0275	6069000000-E STILLING E	210.000 BASINS	CY	\$27.6000	\$5,796.00
0276	6070000000-N SPECIAL ST	10.000	EA	\$1,500.0000	\$15,000.00
0277	6071012000-E COIR FIBER		LF	\$11.0500	\$164,976.50
0278	6071013000-E WATTLE BAR	31250.000 RRIER	LF	\$14.3500	\$448,437.50
0279	6071020000-E POLYACRYLA	17715.000 MIDE (PAM)	LB	\$13.2500	\$234,723.75
0280	6071030000-E COIR FIBER	27830.000 R BAFFLE	LF	\$7.7500	\$215,682.50
0281	6071050000-E **" SKIMME	75.000 GR (1-1/2")	EA	\$5,770.0000	\$432,750.00
0282	6071050000-E **" SKIMME	18.000 CR (2")	EA	\$8,630.0000	\$155,340.00
0283	6071050000-E **" SKIMME	13.000 GR (2-1/2")	EA	\$11,400.0000	\$148,200.00
0284	6071050000-E **" SKIMME	1.000 ER (3")	EA	\$14,800.0000	\$14,800.00
0285	6084000000-E	365.000	ACR	\$2,180.0000	\$795,700.00

251.000 ACR

19.250 TON

7250.000 LB

9500.000 LB

283.750 TON

770.000 LF

180.000 MHR

SEEDING & MULCHING

SEED FOR REPAIR SEEDING

FERTILIZER TOPDRESSING

IMPERVIOUS DIKE

FERTILIZER FOR REPAIR SEEDING

SEED FOR SUPPLEMENTAL SEEDING

6087000000-E

6090000000-E

6093000000-E

6096000000-E

6108000000-E

6111000000-E

6114500000-N

MOWING

0286

0287

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Check: 310BBD21E1 Amendment Count: 3

\$30,371.00

\$80,112.50

\$30,800.00

\$41,800.00

\$570,337.50

\$67,952.50

\$14,895.00

\$121.0000

\$11.0500

\$4.4000

\$88.2500

\$82.7500

\$1,600.0000

\$2,010.0000

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	SPECIALIZED HAND MOWING		
0293	6117000000-N 150.000 EA RESPONSE FOR EROSION CONTROL	\$0.0100	\$1.50
0294	6117500000-N 32.000 EA CONCRETE WASHOUT STRUCTURE	\$1,600.0000	\$51,200.00
0295	6120000000-E 1010.000 CY CULVERT DIVERSION CHANNEL	\$14.1000	\$14,241.00
0296	6132000000-N 100.000 EA GENERIC EROSION CONTROL ITEM FABRIC INSERT I	\$166.0000 NLET PROTECTION DEVICE	
0297	6132000000-N 33.000 EA GENERIC EROSION CONTROL ITEM FABRIC INSERT I	\$204.0000 NLET PROTECTIONDEVICE	\$6,732.00
0298	7048500000-E 4.000 EA PEDESTRIAN SIGNAL HEAD (16", 1SECTION W/COUN	\$1,100.0000 TDOWN)	\$4,400.00
0299	7060000000-E 7500.000 LF SIGNAL CABLE	\$3.3000	\$24,750.00
0300	7120000000-E 32.000 EA VEHICLE SIGNAL HEAD (12", 3 SECTION)	\$1,100.0000	\$35,200.00
0301	7132000000-E 11.000 EA VEHICLE SIGNAL HEAD (12", 4 SECTION)	\$1,210.0000	\$13,310.00
0302	7144000000-E 3.000 EA VEHICLE SIGNAL HEAD (12", 5 SECTION)	\$1,660.0000	\$4,980.00
0303	7264000000-E 550.000 LF MESSENGER CABLE (3/8")	\$6.6000	\$3,630.00
0304	730000000-E 550.000 LF UNPAVED TRENCHING (*******) (1, 2")	\$13.2500	\$7,287.50
0305	730000000-E 405.000 LF UNPAVED TRENCHING (*******) (2, 2")	\$16.5500	\$6,702.75
0306	730000000-E 310.000 LF UNPAVED TRENCHING (*******) (4, 2")	\$24.3000	\$7,533.00
0307	7301000000-E 200.000 LF DIRECTIONAL DRILL (********) (1, 2")	\$17.6500	\$3,530.00
0308	7301000000-E 575.000 LF DIRECTIONAL DRILL (********) (2, 2")	\$26.5000	\$15,237.50
0309	7301000000-E 100.000 LF DIRECTIONAL DRILL (********) (3, 2")	\$32.0000	\$3,200.00
0310	7301000000-E 275.000 LF DIRECTIONAL DRILL (********) (4, 2")	\$39.7000	\$10,917.50
0311	7301000000-E 150.000 LF DIRECTIONAL DRILL (********) (5, 2")	\$47.5000	\$7,125.00
0312	7324000000-N 8.000 EA JUNCTION BOX (STANDARD SIZE)	\$660.0000	\$5,280.00
0313	7348000000-N 10.000 EA JUNCTION BOX (OVER-SIZED, HEA-VY DUTY)	\$1,050.0000	\$10,500.00
0314	736000000-N 4.000 EA WOOD POLE	\$1,100.0000	\$4,400.00
0315	7372000000-N 7.000 EA GUY ASSEMBLY	\$610.0000	\$4,270.00
0316	7408000000-E 2.000 EA 1" RISER WITH WEATHERHEAD	\$830.0000	\$1,660.00

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0317	7420000000-E 3.000 EA 2" RISER WITH WEATHERHEAD	\$1,050.0000 \$3,150.00
0318	7444000000-E 3600.000 LF INDUCTIVE LOOP SAWCUT	\$12.4000 \$44,640.0
0319	7456000000-E 11000.000 LF LEAD-IN CABLE (**********) (14-2)	\$2.7500 \$30,250.00
0320	7481000000-N 1.000 EA SITE SURVEY	\$1,930.0000 \$1,930.00
0321	7481240000-N 3.000 EA CAMERA WITHOUT INTERNAL LOOP EMULATOR	\$4,640.0000 \$13,920.00 PROCESSING UNIT
0322	7481260000-N 1.000 EA EXTERNAL LOOP EMULATOR PRO- CESSING	\$7,180.0000 \$7,180.0
0323	7575142010-N 10.000 EA 900MHZ SERIAL/ETHERNET SPREAD SPECTRUM	\$4,860.0000 \$48,600.00
0324	7588000000-N 10.000 EA METAL POLE WITH SINGLE MAST ARM	\$20,400.0000 \$204,000.0
0325	7590000000-N 2.000 EA METAL POLE WITH DUAL MAST ARM	\$27,500.0000 \$55,000.00
0326	7613000000-N 12.000 EA SOIL TEST	\$1,600.0000 \$19,200.00
0327	7614100000-E 84.000 CY DRILLED PIER FOUNDATION	\$1,100.0000 \$92,400.00
0328	7631000000-N 12.000 EA MAST ARM WITH METAL POLE DE- SIGN	\$110.0000 \$1,320.00
0329	7636000000-N 14.000 EA SIGN FOR SIGNALS	\$276.0000 \$3,864.0
0330	7642200000-N 7.000 EA TYPE II PEDESTAL WITH FOUND- ATION	\$2,320.0000 \$16,240.00
0331	7684000000-N 4.000 EA SIGNAL CABINET FOUNDATION	\$2,210.0000 \$8,840.0
0332	7696000000-N 4.000 EA CONTROLLERS WITH CABINET (*******	\$17,700.0000 \$70,800.00 *********************************
0333	7744000000-N 22.000 EA DETECTOR CARD (TYPE 170)	\$276.0000 \$6,072.00
0334	7901000000-N 4.000 EA CABINET BASE EXTENDER	\$610.0000 \$2,440.0
0335	7948000000-N 1.000 EA TRAFFIC SIGNAL REMOVAL	\$2,760.0000 \$2,760.00
0336	7960000000-N 1.000 EA METAL POLE FOUNDATION REMOVAL	\$3,860.0000 \$3,860.00
0337	7972000000-N 1.000 EA METAL POLE REMOVAL	\$1,660.0000 \$1,660.00
0338	7980000000-N 6.000 EA GENERIC SIGNAL ITEM 2070E CONTROLLER	\$4,640.0000 \$27,840.00
0339	7980000000-N 2.000 EA GENERIC SIGNAL ITEM PROTECTIVE COATING	\$2,090.0000 \$4,180.00 FOR DUAL MAST ARM POLE (BLACK)
0340	7980000000-N 7.000 EA GENERIC SIGNAL ITEM PROTECTIVE COATING	\$110.0000 \$770.00 FOR SIGNAL PEDESTAL (BLACK)
0341	7980000000-N 10.000 EA	\$1,380.0000 \$13,800.0

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	CENEDIC CICNAL THEM DECHECHINE COARTIC FOR CINC	LE MAST ARM POLE	(BLACK)
	GENERIC SIGNAL ITEM PROTECTIVE COATING FOR SING		•
0392	5673000000-E 305.900 LF FIRE HYDRANT LEG	\$92.5000	\$28,295.75
0393	5686000000-E 94.700 LF **" WATER SERVICE LINE (2")	\$94.7500	\$8,972.83
0394	5776000000-E 19.000 EA 5' DIA UTILITY MANHOLE	\$7 , 270.0000	\$138,130.00
0395	5781000000-E 139.000 LF UTILITY MANHOLE WALL 4' DIA	\$320.0000	\$44,480.00
0396	5782000000-E 215.000 LF UTILITY MANHOLE WALL 5' DIA	\$436.0000	\$93,740.00
0397	5912000000-N 1.000 LS GENERIC UTILITY ITEM UTILITY COORDINATOR	\$745,200.0000	\$745,200.00
0398		\$850.0000 N SOIL (36", 0.500'	
0399	0973300000-E 276.000 LF **" WELDED STEEL PIPE, ****" THICK, GRADE B NO	\$2,380.0000	\$656,880.00
0400	0973300000-E 122.000 LF **" WELDED STEEL PIPE, ****" THICK, GRADE B NO	\$2,620.0000	\$319,640.00
0401	3575000000-E 100.000 LF GENERIC FENCING ITEM ORNAMENTAL WOOD FENCE	\$140.0000	\$14,000.00
0402	436000000-N 4.000 EA	\$9,380.0000	\$37,520.00
	GENERIC SIGNING ITEM RRFB ASSEMBLY		
0403	GENERIC SIGNING ITEM RRFB ASSEMBLY 4360000000-N GENERIC SIGNING ITEM ADVANCE WARNING FLASHING E		\$25,830.00
0403 Section 0001 Tot	436000000-N 3.000 EA GENERIC SIGNING ITEM ADVANCE WARNING FLASHING E		\$25,830.00 \$92,922,448.99
Section 0001 Tot	436000000-N 3.000 EA GENERIC SIGNING ITEM ADVANCE WARNING FLASHING E al		
Section 0001 Tot Section 0002 CULVERT ITEMS	436000000-N 3.000 EA GENERIC SIGNING ITEM ADVANCE WARNING FLASHING E al	\$38,600.0000	\$92,922,448.99
Section 0001 Tot	436000000-N 3.000 EA GENERIC SIGNING ITEM ADVANCE WARNING FLASHING E al 8056000000-N 1.000 LS	\$38,600.0000	\$92,922,448.99
Section 0001 Tot Section 0002 CULVERT ITEMS 0342	436000000-N 3.000 EA GENERIC SIGNING ITEM ADVANCE WARNING FLASHING E al 805600000-N 1.000 LS REMOVAL OF EXISTING STRUCTURE AT STATION ******	\$38,600.0000 ****** (874+45.00 \$1,320.0000 \$247,200.0000	\$92,922,448.99 \$38,600.00
Section 0001 Tot Section 0002 CULVERT ITEMS 0342	436000000-N 3.000 EA GENERIC SIGNING ITEM ADVANCE WARNING FLASHING E al 8056000000-N 1.000 LS REMOVAL OF EXISTING STRUCTURE AT STATION ****** 8065000000-N 1.000 LS ASBESTOS ASSESSMENT 81260000000-N 1.000 LS	\$38,600.0000 ****** (874+45.00 \$1,320.0000 \$247,200.0000	\$92,922,448.99 \$38,600.00 -L3-) \$1,320.00
Section 0001 Tot Section 0002 CULVERT ITEMS 0342 0343 0344	436000000-N 3.000 EA GENERIC SIGNING ITEM ADVANCE WARNING FLASHING E al 8056000000-N 1.000 LS REMOVAL OF EXISTING STRUCTURE AT STATION ****** 8065000000-N 1.000 LS ASBESTOS ASSESSMENT 8126000000-N 1.000 LS CULVERT EXCAVATION, STA ****** (735+38.59 -L3-) 8126000000-N 1.000 LS	\$38,600.0000 \$38,600.0000 \$******* (874+45.00 \$1,320.0000 \$247,200.0000 \$130,100.0000	\$92,922,448.99 \$38,600.00 -L3-) \$1,320.00 \$247,200.00
Section 0001 Tot Section 0002 CULVERT ITEMS 0342 0343 0344	436000000-N 3.000 EA GENERIC SIGNING ITEM ADVANCE WARNING FLASHING E al 8056000000-N 1.000 LS REMOVAL OF EXISTING STRUCTURE AT STATION ****** 8065000000-N 1.000 LS ASBESTOS ASSESSMENT 8126000000-N 1.000 LS CULVERT EXCAVATION, STA ****** (735+38.59 -L3-) 8126000000-N 1.000 LS CULVERT EXCAVATION, STA ****** (797+66.00 -L3-) 8126000000-N 1.000 LS CULVERT EXCAVATION, STA ****** (830+02.00 -L3-) 8126000000-N 1.000 LS CULVERT EXCAVATION, STA ****** (830+02.00 -L3-)	\$38,600.0000 \$38,600.0000 \$****** (874+45.00 \$1,320.0000 \$247,200.0000 \$130,100.0000 \$278,700.0000	\$92,922,448.99 \$38,600.00 -L3-) \$1,320.00 \$247,200.00 \$130,100.00
Section 0001 Tot Section 0002 CULVERT ITEMS 0342 0343 0344 0345 0346	436000000-N 3.000 EA GENERIC SIGNING ITEM ADVANCE WARNING FLASHING E al 8056000000-N 1.000 LS REMOVAL OF EXISTING STRUCTURE AT STATION ****** 8065000000-N 1.000 LS ASBESTOS ASSESSMENT 8126000000-N 1.000 LS CULVERT EXCAVATION, STA ****** (735+38.59 -L3-) 8126000000-N 1.000 LS CULVERT EXCAVATION, STA ****** (797+66.00 -L3-) 8126000000-N 1.000 LS CULVERT EXCAVATION, STA ****** (830+02.00 -L3-)	\$38,600.0000 \$38,600.0000 \$****** (874+45.00 \$1,320.0000 \$247,200.0000 \$130,100.0000 \$278,700.0000	\$92,922,448.99 \$38,600.00 -L3-) \$1,320.00 \$247,200.00 \$130,100.00
Section 0001 Tot Section 0002 CULVERT ITEMS 0342 0343 0344 0345	### 3.000 EA ### GENERIC SIGNING ITEM ADVANCE WARNING FLASHING E ### al ### 8056000000-N ### REMOVAL OF EXISTING STRUCTURE AT STATION ****** ### 8065000000-N ### ASBESTOS ASSESSMENT ### 8126000000-N ### CULVERT EXCAVATION, STA ****** (735+38.59 -L3-) ### 8126000000-N ### CULVERT EXCAVATION, STA ******* (797+66.00 -L3-) ### 8126000000-N ### CULVERT EXCAVATION, STA ******* (830+02.00 -L3-) ### 8126000000-N ### CULVERT EXCAVATION, STA ******* (874+45.00 -L3-) ### 8126000000-N ### CULVERT EXCAVATION, STA ***********************************	\$38,600.0000 ****** (874+45.00 \$1,320.0000 \$247,200.0000 \$130,100.0000 \$278,700.0000 \$92,100.0000	\$92,922,448.99 \$38,600.00 -L3-) \$1,320.00 \$247,200.00 \$130,100.00 \$278,700.00

Errors: No Page 16

Letting: L211221 North Carolina Department of Transportation Contract ID: C204397 12/21/2021 02:00:00 PM 3762 - Wright Brothers Construction Company, Inc Call: 002 8590000000-E 32.000 TON 0351 \$72.7500 \$2,328.00 RIP RAP, CLASS ** (II) 0352 8622000000-E 1695.000 SY \$5.1000 \$8,644.50 GEOTEXTILE FOR DRAINAGE Section 0002 Total \$4,938,097.70 Section 0003 WALL ITEMS 0353 8504000000-E \$451.0000 \$120,868.00 268,000 LF CONCRETE BARRIER RAIL WITH MOMENT SLAB 0354 8801000000-E 6350.000 SF \$94.7500 \$601,662.50 MSE RETAINING WALL NO **** (1) 0355 8801000000-E 4335.000 SF \$116.0000 \$502,860.00 MSE RETAINING WALL NO **** (2) \$101.0000 0356 8801000000-E 4665.000 SF \$471,165.00 MSE RETAINING WALL NO **** (6) 0357 8847000000-E 149026.000 SF \$2.3500 \$350,211.10 GENERIC RETAINING WALL ITEM ARCHITECTURAL SURFACE TREAT- MENT 8847000000-E \$715,647.30 0358 18303.000 SF \$39.1000 GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW11-0359 8847000000-E 26005.000 SF \$39.1000 \$1,016,795.50 GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW13-0360 8847000000-E 7308.000 \$287,204.40 \$39.3000 GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW15-0361 8847000000-E 14210.000 SF \$39.1000 \$555,611.00 GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW5A-0362 8847000000-E 8208.000 \$320,932.80 \$39.1000 GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW5B-\$707,793.00 0363 18010.000 \$39.3000 8847000000-E GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW8-Section 0003 Total \$5,650,750.60 Section 0004 STRUCTURE ITEMS 0364 8091000000-N 1.000 LS \$22,200.0000 \$22,200.00 FOUNDATION EXCAVATION FOR BENT** AT STATION ************* (1, 20+88.94 -Y19-) 0365 50.000 LF \$52,000.00 8105560000-E \$1,040.0000 4'-0" DIA DRILLED PIERS IN SOIL \$52,000.00 0366 8105660000-E 50.000 LF \$1,040.0000 4'-0" DIA DRILLED PIERS NOT IN SOIL 0367 8115000000-N 1.000 \$3,860.0000 \$3,860.00 CSL TESTING 0368 8147000000-E 38861.000 SF \$42.3000 \$1,643,820.30 REINFORCED CONCRETE DECK SLAB 0369 8161000000-E 40654.000 SF \$0.5000 \$20,327.00 GROOVING BRIDGE FLOORS

> Errors: No Page 17

Letting: L211221 North Carolina Department of Transportation Contract ID: C204397 12/21/2021 02:00:00 PM 3762 - Wright Brothers Construction Company, Inc Call: 002 8182000000-E 601.600 CY 0370 \$1,420.0000 \$854,272.00 CLASS A CONCRETE (BRIDGE) 0371 8210000000-N 1.000 LS \$55,100.0000 \$55,100.00 BRIDGE APPROACH SLABS, STATION********* (20+88.94 -Y19-) 0372 8210000000-N 1.000 LS \$110,600.0000 \$110,600.00 BRIDGE APPROACH SLABS, STATION******** (26+65.52 -Y3-) 0373 8210000000-N 1.000 LS \$66,200.0000 \$66,200.00 BRIDGE APPROACH SLABS, STATION************* (774+41.49 -L3- LT) 0374 8210000000-N 1.000 LS \$66,200.0000 \$66,200.00 BRIDGE APPROACH SLABS, STATION********* (774+41.49 -L3- RT) 0375 8217000000-E 98466.000 LB \$1.3000 \$128,005.80 REINFORCING STEEL (BRIDGE) 0376 8238000000-E 7072.000 LB \$2.7000 \$19,094.40 SPIRAL COLUMN REINFORCING STEEL (BRIDGE) 0377 8265000000-E 2104.670 LF \$361.0000 \$759,785.87 54" PRESTRESSED CONCRETE GIR- DERS 0378 8277000000-E 2254.900 LF \$399.0000 \$899,705.10 MODIFIED 72" PRESTRESSED CONC GIRDERS 8328200000-E 0379 72.000 EA \$484.0000 \$34,848.00 PILE DRIVING EQUIPMENT SETUP (HP 12 X 53) 0380 8328200000-E 30.000 EA \$399.0000 \$11,970.00 PILE DRIVING EQUIPMENT SETUP (HP 14 X 73) 8364000000-E 0381 4005.000 LF \$72.7500 \$291,363.75 HP12X53 STEEL PILES 8384000000-E 0382 940.000 LF \$97.0000 \$91,180.00 HP14X73 STEEL PILES 0383 8391000000-N 18.000 EA \$420.0000 \$7,560.00 STEEL PILE POINTS 8392500000-E 0384 170.000 LF \$161.0000 \$27,370.00 PREDRILLING FOR PILES 0385 8475000000-E 496.770 LF \$120.0000 \$59,612.40 TWO BAR METAL RAIL 8482000000-E \$188.0000 \$64,656.96 0386 343.920 LF THREE BAR METAL RAIL 0387 8503000000-E 407.200 LF \$154.0000 \$62,708.80 CONCRETE BARRIER RAIL 0388 8505000000-E 277.140 LF \$130.0000 \$36,028.20 VERTICAL CONCRETE BARRIER RAIL 0389 8517000000-E 504.550 LF \$113.0000 \$57,014.15 1'-**"X *****" CONCRETE PARA- PET (1'-2" X 2'-6") 0390 8531000000-E 2278.000 SY \$90.0000 \$205,020.00 4" SLOPE PROTECTION \$23,500.0000 \$23,500.00 0391 8657000000-N 1.000 LS ELASTOMERIC BEARINGS Section 0004 Total \$5,726,002.73

Item Total

\$109,237,300.02

Contract ID: C204397 Call: 002

ELECTRONIC BID SUBMISSION

By submitting this bid electronically, I hereby acknowledge that all requirements included in the hard copy proposal, addendum, amendments, plans, standard specifications, supplemental specifications and special provisions are part of the bid and contract. Further, I acknowledge that I have read, understand, accept, acknowledge and agree to comply with all statements in this electronic bid.

NON-COLLUSION, DEBARMENT AND GIFT BAN CERTIFICATION

The prequalified bidder declares (or certifies, verifies, or states) under penalty of perjury under the laws of the United States that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating N.C.G.S. §133-24 within the last three years, and that the prequalified bidder intends to do the work with his own bonafide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the Contractor is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. §133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

DEBARMENT CERTIFICATION OF PREQUALIFIED BIDDER

Conditions for certification:

- 1. The prequalified bidder shall provide immediate written notice to the Department if at any time the bidder learns that his certification was erroneous when he submitted his debarment certification or explanation that is file with the Department, or has become erroneous because of changed circumstances.
- 2. The terms covered transaction, debarred, suspended, ineligible, lower tier

covered transaction, participant, person, primary covered transaction, principal, proposal, and voluntarily excluded, as used in this provision, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. A copy of the Federal Rules requiring this certification and detailing the definitions and coverages may be obtained from the Contract Officer of the Department.

- 3. The prequalified bidder agrees by submitting this form, that he will not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in NCDOT contracts, unless authorized by the Department.
- 4. For Federal Aid projects, the prequalified bidder further agrees that by submitting this form he will include the Federal- Aid Provision titled Required Contract Provisions Federal-Aid Construction Contract (Form FHWA PR 1273) provided by the Department, without subsequent modification, in all lower tier covered transactions.
- 5. The prequalified bidder may rely upon a certification of a participant in a lower tier covered transaction that he is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless he knows that the certification is erroneous. The bidder may decide the method and frequency by which he will determine the eligibility of his subcontractors.
- 6. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this provision. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- 7. Except as authorized in paragraph 6 herein, the Department may terminate any contract if the bidder knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available by the Federal Government.

DEBARMENT CERTIFICATION

The prequalified bidder certifies to the best of his knowledge and belief, that he and his principals:

- a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- b. Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or

North Carolina Department of Transportation 3762 - Wright Brothers Construction Company, Inc Contract ID: C204397 Call: 002

commission of embezzlement, theft, forgery, bribery, falsification or destruction of records; making false statements; or receiving stolen property;

- c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph b. of this certification; and
- d. Have not within a three-year period preceding this proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
- e. Will submit a revised Debarment Certification immediately if his status changes and will show in his bid proposal an explanation for the change in status.

If the prequalified bidder cannot certify that he is not debarred, he shall provide an explanation with this submittal. An explanation will not necessarily result in denial of participation in a contract.

Failure to submit a non-collusion and debarment certification will result in the prequalified bidder's bid being considered non-responsive.

EXPLANATION:

Errors: No Page 21

Award Limits on Multiple Projects

By answering YES to this statement, the bidder acknowleges that they are using the award limits on multiple projects? Yes \bigcirc No \odot

A bidder who desires to bid on more than one project on which bids are to be opened on the same date, and who also desires to avoid receiving an award of more projects than he is equipped to handle, may bid on any number of projects but may limit the total amount of work awarded to him on selected projects by completing the AWARD LIMITS ON MULTIPLE PROJECTS.

The Award Limits on Multiple Projects must be filled in on each project bid for which the Bidder desires protection.

It is the desire of the Bidder to be awarded contracts, the value of which

will not exceed a total of for those

projects indicated herein, for which bids will be opened on (MM/DD/YY)

The Award Limits shall apply to the following projects:

Contract Number County

It is agreed that if I am (we are) the low Bidder(s) on indicated projects, the total value of which is more than the above stipulated award limits, the Board of Transportation will award me (us) projects from among those indicated

North Carolina Department of Transportation 3762 - Wright Brothers Construction Company, Inc

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that have a total value not to exceed the award limit and will result in the lowest total bids to the Department of Transportation.

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DBE List Summary

Project: STATE FUNDED Bidder ID: 3762

Bid Total: 109,237,300.02 Business Name: Wright Brothers Construction

Company, Inc.

Goal: 9.00% (9,831,357.00)

Total Entered: 9.04% (9,879,903.85)

ID	Name	Is Supplier? Item Count	Amount Is Complete?
10129	CONCRETE SPECIALTY CONTRACTORS INC	False 15	1,974,452.50 True
5534	HIGH COUNTRY HYDROSEEDING INC	False 24	5,061,291.75 True
4880	Tricor Construction, Inc.	False 6	2,844,159.60 True

Errors: No Page 24

Check: 310BBD21E1 Amendment Count: 3

North Carolina Department of Transportation 3762 - Wright Brothers Construction Company, Inc

Name: CONCRETE SPECIALTY CONTRACTORS INC ID: 10129

Address: POST OFFICE BOX 2303 , SHELBY, NC 28151

Used As: SubContractor DBE Items Total:\$1,974,452.50

Items for CONCRETE SPECIALTY CONTRACTORS INC

0001 ROADWAY II	'EMS - NPAR (BROAD RIVER W	ATER AUTHORITY)						
0057	·	310.000 SY	\$96.0000	\$29,760.00				
0082	1891000000-E GENERIC PAVING	590.000 SY G ITEM 7" CONCRETE TRUCK APRON	\$98.0000	\$57,820.00				
0114		34.000 EA SITIONAL SECTION FOR DROP INLET	\$1,300.0000	\$44,200.00				
0117	2535000000-E **"X **" CONCE	2535000000-E 230.000 LF \$26. **"X **" CONCRETE CURB (8" X 12")						
0118	2549000000-E 2'-6" CONCRETE	18400.000 LF CURB & GUTTER	\$26.6000	\$489,440.00				
0119	2556000000-E SHOULDER BERM		\$34.5000	\$183,195.00				
0120	2577000000-E CONCRETE EXPRE	750.000 LF CSSWAY GUTTER	\$40.4800	\$30,360.00				
0121	2591000000-E 4" CONCRETE SI		\$48.0000	\$263,040.00				
0122	2605000000-N CONCRETE CURB	6.000 EA RAMPS	\$2,000.0000	\$12,000.00				
0123	2612000000-E 6" CONCRETE DE	560.000 SY RIVEWAY	\$70.0000	\$39,200.00				
0124	2619000000-E 4" CONCRETE PA		\$80.0000	\$14,160.00				
0125	2647000000-E 5" MONOLITHIC	8850.000 SY CONCRETE ISLANDS (SURFACE MOUNT	\$64.7000 FED)	\$572,595.00				
0126		490.000 SY CONCRETE ISLANDS (KEYED IN)	\$66.2500	\$32,462.50				
0129	2752000000-E GENERIC PAVING	360.000 LF G ITEM 2'-0" MODIFIED VALLEY GU	\$50.0000 JTTER	\$18,000.00				
Section 0001	Total			\$1,792,212.50				
0004 STRUCTURE	ITEMS							
0390	8531000000-E 4" SLOPE PROTE	2278.000 SY CCTION	\$80.0000	\$182,240.00				

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Contract ID: C204397

Call: 002

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Contract ID: C204397 Call: 002

Section 0004 Total \$182,240.00

Item Total \$1,974,452.50

Errors: No Page 26 Check: 310BBD21E1 Amendment Count: 3

Name: HIGH COUNTRY HYDROSEEDING INC ID: 5534

Address: 276 SWEETWATER DRIVE , CANTON, NC 28716

Used As: SubContractor DBE Items Total:\$5,061,291.75

Items for HIGH COUNTRY HYDROSEEDING INC

0001 ROADWAY I	TEMS - NPAR (BROAD RIVER WATER .	AUTHORTTY)		
0001	0000100000-N MOBILIZATION	1.000	-	\$75,000.0000	\$75,000.00
0259	6000000000-E 14 TEMPORARY SILT FENC		LF	\$2.7000	\$386,100.00
0263	6015000000-E TEMPORARY MULCHING	711.000	ACR	\$875.0000	\$622,125.00
0264	6018000000-E 2 SEED FOR TEMPORARY		LB	\$3.2500	\$90,025.00
0265	6021000000-E FERTILIZER FOR TEME			\$1,825.0000	\$258,237.50
0267	6029000000-E SAFETY FENCE	1320.000	LF	\$2.0000	\$22,640.00
0269	6036000000-E 89 MATTING FOR EROSION		SY	\$1.3000	\$1,160,250.00
0270	6037000000-E COIR FIBER MAT	2640.000	SY	\$7.3000	\$19,272.00
0271	6038000000-E PERMANENT SOIL REIN	32000.000 IFORCEMENT	_	\$3.7000	\$118,400.00
0272	6042000000-E 1/4" HARDWARE CLOTF		LF	\$4.6000	\$52,141.00
0277	6071012000-E COIR FIBER WATTLE	14930.000	LF	\$10.0000	\$149,300.00
0278	6071013000-E WATTLE BARRIER	31250.000	LF	\$13.0000	\$406,250.00
0280	6071030000-E COIR FIBER BAFFLE	27830.000	LF	\$7.0000	\$194,810.00
0281	6071050000-E **" SKIMMER (1-1/2"	75.000	EA	\$775.0000	\$58,125.00
0282	6071050000-E **" SKIMMER (2")	18.000	EA	\$900.0000	\$16,200.00
0283	6071050000-E **" SKIMMER (2-1/2"	13.000	EA	\$975.0000	\$12,675.00
0284	6071050000-E **" SKIMMER (3")	1.000	EA	\$1,500.0000	\$1,500.00
0285	6084000000-E SEEDING & MULCHING	365.000	ACR	\$1,975.0000	\$720,875.00

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Check: 310BBD21E1 Amendment Count: 3

Contract ID: C204397

Call: 002

Letting: L211221 12/21/2021 02:00:00 F	РМ		rtment of Transportation Construction Company, I	nc	Contract ID: C204397 Call: 002
0286	6087000000-E MOWING	251.000	ACR	\$110.0000	\$27,610.00
0287	6090000000-E SEED FOR	7250.000 REPAIR SEEDING	LB	\$10.0000	\$72,500.00
0288	6093000000-E FERTILIZ	19.250 ER FOR REPAIR SEEDIN		\$1,450.0000	\$27,912.50
0289	6096000000-E SEED FOR	9500.000 SUPPLEMENTAL SEEDIN		\$4.0000	\$38,000.00
0290	6108000000-E FERTILIZ	283.750 ER TOPDRESSING	TON	\$1,825.0000	\$517,843.75
0292	6114500000-N SPECIALI	180.000 ZED HAND MOWING	MHR	\$75.0000	\$13,500.00
Section 0001 Tot	al				\$5,061,291.75
Item Total					\$5,061,291.75

Errors: No Page 28 Check: 310BBD21E1 Amendment Count: 3 Letting: L211221 North Carolina Department of Transportation

Contract ID: C204397 12/21/2021 02:00:00 PM 3762 - Wright Brothers Construction Company, Inc Call: 002

Name: Tricor Construction, Inc. ID: 4880

Address: 1983 Chesnee Highway, Spartanburg, SC 29303

Used As: SubContractor DBE Items Total:\$2,844,159.60

Items for Tricor Construction, Inc.

0003 WALL ITEMS		,								
0358	8847000000-E		18303.000	SF				\$30.9	9000	\$565,562.70
	GENERIC	RETAINING	WALL ITEM	SOUND	BARRIER	WALL	NO	-NW11-		
0359	8847000000-E		26005.000	SF				\$30.9	9000	\$803,554.50
	GENERIC	RETAINING	WALL ITEM	SOUND	BARRIER	WALL	NO	-NW13-		
0360	8847000000-E		7308.000	SF				\$30.9	9000	\$225,817.20
	GENERIC	RETAINING	WALL ITEM	SOUND	BARRIER	WALL	NO	-NW15-		
0361	8847000000-E		14210.000	SF				\$30.9	9000	\$439,089.00
	GENERIC	RETAINING	WALL ITEM	SOUND	BARRIER	WALL	NO	-NW5A-		
0362	8847000000-E		8208.000	SF				\$30.9	9000	\$253,627.20
	GENERIC	RETAINING	WALL ITEM	SOUND	BARRIER	WALL	NO	-NW5B-		
0363	8847000000-E		18010.000	SF				\$30.9	9000	\$556,509.00
	GENERIC	RETAINING	WALL ITEM	SOUND	BARRIER	WALL	NO	-NW8-		
Section 0003 Tota	1									\$2,844,159.60
									-	
Item Total										\$2,844,159.60

Errors: No Page 29

Check: 310BBD21E1 Amendment Count: 3 Letting: L211221 12/21/2021 02:00:00 PM

North Carolina Department of Transportation 3762 - Wright Brothers Construction Company, Inc

Contract ID: C204397 Call: 002

THIS PROPOSAL CONTAINS THE FOLLOWING ERRORS/WARNINGS (IF ANY)

This Bid contains 3 amendment files

000001 12/06/2021 ADD, MODIFY & DELETE ITEMS 000002 12/13/2021 MODIFY & ADD ITEMS 000003 12/14/2021 ADD ITEMS

Electronic Bid Submission

By submitting this bid electronically, I hereby acknowledge that all requirements included in the hard copy proposal, addendum, amendments, plans, standard specifications, supplemental specifications and special provisions are part of the bid and contract. Further, I acknowledge that I have read, understand, accept, acknowledge and agree to comply with all statements in this electronic bid.

I hereby	certify	that	I	have	the	authority	to	submit	this	bid.
Signature	e							_		
							_			
Date										
Signature	e							_		
Agency							_			
Date										
Signature	e							_		
Agency							_			
Date										

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		Contract Item Sheets For C204397						
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid		
			ROADWAY ITEMS					
0001	0000100000-N	800	MOBILIZATION	Lump Sum	5,460,000.00	5,460,000.00		
				LS				
0002	0000400000-N	801	CONSTRUCTION SURVEYING	Lump Sum LS	1,803,000.00	1,803,000.00		
0003	0001000000-E	200	CLEARING & GRUBBING ACRE(S)	Lump Sum LS	5,057,110.00	5,057,110.00		
0004	0008000000-E	200	SUPPLEMENTARY CLEARING & GRUB- BING	5 ACR	8,450.00	42,250.00		
0005	0015000000-N	205	SEALING ABANDONED WELLS	3 EA	3,300.00	9,900.00		
0006	0022000000-E	225	UNCLASSIFIED EXCAVATION	2,860,000 CY	5.30	15,158,000.00		
0007	0028000000-N	SP	TYPE I STANDARD APPROACH FILL STATION *********** (20+88.94 -Y19-)	Lump Sum LS	43,500.00	43,500.00		
0008	0028000000-N	SP	TYPE I STANDARD APPROACH FILL STATION ********** (26+65.52 -Y3-)	Lump Sum LS	67,600.00	67,600.00		
0009	0029000000-N	SP	TYPE III REINFORCED APPROACH FILL, STATION ******* (774+41.49 -L3- LT)	Lump Sum LS	93,000.00	93,000.00		
0010	0029000000-N	SP	TYPE III REINFORCED APPROACH FILL, STATION ******* (774+41.49 -L3- RT)	Lump Sum LS	93,000.00	93,000.00		
0011	0036000000-E	225	UNDERCUT EXCAVATION	13,500 CY	9.95	134,325.00		
0012	0134000000-E	240	DRAINAGE DITCH EXCAVATION	25,650 CY	7.00	179,550.00		
0013	0141000000-E	240	BERM DITCH CONSTRUCTION	1,810 LF	5.90	10,679.00		
0014	0156000000-E	250	REMOVAL OF EXISTING ASPHALT PAVEMENT	47,600 SY	3.75	178,500.00		
0015	0163000000-E	250	REMOVAL OF EXISTING CONCRETE PAVEMENT	3,400 SY	11.25	38,250.00		
0016	0177000000-E	250	BREAKING OF EXISTING ASPHALT PAVEMENT	7,500 SY	2.00	15,000.00		
0017	0192000000-N	260	PROOF ROLLING	100 HR	248.00	24,800.00		
0018	0195000000-E	265	SELECT GRANULAR MATERIAL	11,500 CY	63.50	730,250.00		

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Contract Item Sheets For C204397							
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid	
0019	0196000000-E	270	GEOTEXTILE FOR SOIL STABILIZA- TION	53,500 SY	2.25	120,375.00	
0020	0255000000-E	SP	GENERIC GRADING ITEM HAULING AND DISPOSAL OF PETRO- LEUM CONTAMINATED SOIL	100 TON	102.00	10,200.00	
0021	0318000000-E	300	FOUNDATION CONDITIONING MATE- RIAL, MINOR STRUCTURES	8,218 TON	38.10	313,105.80	
0022	0320000000-E	300	FOUNDATION CONDITIONING GEO- TEXTILE	25,834 SY	3.80	98,169.20	
0023	0335200000-E	305	15" DRAINAGE PIPE	2,484 LF	57.00	141,588.00	
0024	0335300000-E	305	18" DRAINAGE PIPE	1,796 LF	67.00	120,332.00	
0025	0335400000-E	305	24" DRAINAGE PIPE	1,328 LF	86.75	115,204.00	
0026	0335500000-E	305	30" DRAINAGE PIPE	1,036 LF	132.00	136,752.00	
0027	0335600000-E	305	36" DRAINAGE PIPE	264 LF	129.00	34,056.00	
0028	0335700000-E	305	42" DRAINAGE PIPE	32 LF	179.00	5,728.00	
0029	0354000000-E	310	***" RC PIPE CULVERTS, CLASS ***** (54", V)	352 LF	488.00	171,776.00	
0030	0366000000-E	310	15" RC PIPE CULVERTS, CLASS III	14,496 LF	59.75	866,136.00	
0031	0372000000-E	310	18" RC PIPE CULVERTS, CLASS III	6,076 LF	64.75	393,421.00	
0032	0378000000-E	310	24" RC PIPE CULVERTS, CLASS III	4,800 LF	81.25	390,000.00	
0033	0384000000-E	310	30" RC PIPE CULVERTS, CLASS III	3,316 LF	108.00	358,128.00	
0034	0390000000-E	310	36" RC PIPE CULVERTS, CLASS III	1,700 LF	129.00	219,300.00	
0035	0396000000-E	310	42" RC PIPE CULVERTS, CLASS III	1,256 LF	164.00	205,984.00	

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Amoun Bio	Unit Bid Price	Quantity Unit	Description	Sec #	ItemNumber	Line #
115,328.00	212.00	544 LF	48" RC PIPE CULVERTS, CLASS	310	0402000000-E	0036
310,992.00	372.00	836 LF	54" RC PIPE CULVERTS, CLASS III	310	0408000000-E	 0037
15,600.00	650.00	24 LF	72" RC PIPE CULVERTS, CLASS III	310	0426000000-E	0038
12,943.00	75.25	 172 LF	18" RC PIPE CULVERTS, CLASS IV	310	0448300000-E	0039
33,728.00	124.00	272 LF	30" RC PIPE CULVERTS, CLASS IV	310	0448500000-E	0040
6,120.00	170.00	36 LF	36" RC PIPE CULVERTS, CLASS IV	310	0448600000-E	0041
3,289.00	74.75	44 LF	***" HDPE PIPE CULVERTS (8")	310	0536000000-E	0042
133,056.00	198.00	672 LF	**" CS PIPE CULVERTS, *****" THICK (36", 0.079")	310	0576000000-E	 0043
161,700.00	275.00	588 LF	**" CS PIPE CULVERTS, *****" THICK (42", 0.109")	310	0576000000-E	 0044
29,680.00	530.00	56 LF	**" CS PIPE CULVERTS, *****" THICK (60", 0.138")	310	0576000000-E	 0045
229,368.00	114.00	2,012 LF	15" CS PIPE CULVERTS, 0.064" THICK	310	0582000000-E	 0046
271,400.00	115.00	2,360 LF	18" CS PIPE CULVERTS, 0.064" THICK	310	0588000000-E	 0047
107,408.00	137.00	 784 LF	24" CS PIPE CULVERTS, 0.064" THICK	310	0594000000-E	 0048
107,568.00	166.00	648 LF	30" CS PIPE CULVERTS, 0.079" THICK	310	0600000000-E	 0049
12,480.00	780.00	16 EA	**" CS PIPE ELBOWS, ****" THICK (15", 0.064")	310	0636000000-E	 0050
12,740.00	910.00	14 EA	**" CS PIPE ELBOWS, *****" THICK (18". 0.064")	310	0636000000-E	 0051

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	Contract Item Sheets For C204397									
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid				
0052	0973100000-E	330	**" WELDED STEEL PIPE, ****" THICK, GRADE B IN SOIL (42", 0.625")	276 LF	960.00	264,960.00				
0053	0973100000-Е	330	**" WELDED STEEL PIPE, ****" THICK, GRADE B IN SOIL (66", 0.875")	 122 LF	2,040.00	248,880.00				
0054	0973300000-E	330	**" WELDED STEEL PIPE, ****" THICK, GRADE B NOT IN SOIL (36", 0.500")	346 LF	2,150.00	743,900.00				
0055	0995000000-E	340	PIPE REMOVAL	4,702 LF	30.20	142,000.40				
0056	0996000000-N	350	PIPE CLEAN OUT	4 EA	1,550.00	6,200.00				
0057	1000000000-E	462		310 SY	108.00	33,480.00				
0058	1011000000-N	500	FINE GRADING	Lump Sum LS	1,000,000.00	1,000,000.00				
0059	1044000000-E	501	LIME TREATED SOIL (SLURRY METHOD)	184,940 SY	3.35	619,549.00				
0060	1066000000-E	501	LIME FOR LIME TREATED SOIL	2,220 TON	279.00	619,380.00				
0061	1099500000-E	505	SHALLOW UNDERCUT	15,000 CY	25.00	375,000.00				
0062	1099700000-E	505	CLASS IV SUBGRADE STABILIZA- TION	39,800 TON	28.10	1,118,380.00				
0063	1110000000-E	510	STABILIZER AGGREGATE	1,500 TON	38.70	58,050.00				
0064	1115000000-E	SP	GEOTEXTILE FOR PAVEMENT STA- BILIZATION	129,200 SY	4.25	549,100.00				
0065	1121000000-E	520	AGGREGATE BASE COURSE	92,300 TON	30.70	2,833,610.00				
0066	1176000000-E	542	SOIL CEMENT BASE	184,940 SY	3.35	619,549.00				
0067	1187000000-E	542	PORTLAND CEMENT FOR SOIL CE- MENT BASE	5,179 TON	240.00	1,242,960.00				
0068	1209000000-E	543	ASPHALT CURING SEAL	55,490 GAL	2.75	152,597.50				
0069	1220000000-E	545	INCIDENTAL STONE BASE	10,000 TON	36.10	361,000.00				

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	Contract Item Sheets For C204397									
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid				
0070	1231000000-E	560	SHOULDER BORROW	38,000 CY	13.00	494,000.00				
0071	1275000000-E	600	PRIME COAT	180 GAL	5.50	990.00				
0072	1297000000-E	607	MILLING ASPHALT PAVEMENT, ***" DEPTH (1-1/2")	6,870 SY	9.35	64,234.50				
0073	1308000000-E	607	MILLING ASPHALT PAVEMENT, ***" TO ******" (0" TO 3")	6,200 SY	12.35	76,570.00				
0074	1330000000-E	607	INCIDENTAL MILLING	3,450 SY	23.75	81,937.50				
0075	1491000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0C	28,717 TON	72.25	2,074,803.25				
0076	1503000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C	43,600 TON	76.00	3,313,600.00				
0077	1519000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	22,774 TON	85.50	1,947,177.00				
0078	1523000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	34,220 TON	70.25	2,403,955.00				
0079	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	6,960 TON	805.00	5,602,800.00				
0080	1693000000-E	654	ASPHALT PLANT MIX, PAVEMENT REPAIR	1,000 TON	197.00	197,000.00				
0081	1840000000-E	665	MILLED RUMBLE STRIPS (ASPHALT CONCRETE)	92,000 LF	0.15					
0082	1891000000-E	SP	GENERIC PAVING ITEM 7" CONCRETE TRUCK APRON	590 SY	110.00	64,900.00				
0083	2000000000-N	806	RIGHT-OF-WAY MARKERS	575 EA	420.00	241,500.00				
0084	2022000000-E	815	SUBDRAIN EXCAVATION	1,344 CY	11.55	15,523.20				
0085	2026000000-E	815	GEOTEXTILE FOR SUBSURFACE DRAINS	2,000 SY	4.65	9,300.00				
0086	2033000000-E	815	SUBDRAIN FINE AGGREGATE	336 CY	71.00	23,856.00				
0087		815	SUBDRAIN COARSE AGGREGATE	336 CY	69.25	23,268.00				

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			Contract Item Sheets For C	204397		
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0088	2044000000-E	815	6" PERFORATED SUBDRAIN PIPE	4,000 LF	12.80	51,200.00
0089	2070000000-N	815	SUBDRAIN PIPE OUTLET	8 EA	730.00	5,840.00
0090	2077000000-E	815	6" OUTLET PIPE	48 LF	71.50	3,432.00
0091	2099000000-E	816	SHOULDER DRAIN	20,800 LF	9.70	201,760.00
0092	2110000000-E	816	4" SHOULDER DRAIN PIPE	20,832 LF	1.75	36,456.00
0093	2121000000-E	816	4" OUTLET PIPE FOR SHOULDER DRAINS	2,036 LF	14.70	29,929.20
0094	2132000000-N	816	CONCRETE PAD FOR SHOULDER DRAIN PIPE OUTLET	40 EA	341.00	13,640.00
0095	2143000000-E	818	BLOTTING SAND	20 TON	82.75	1,655.00
0096	2209000000-E	838	ENDWALLS	41.4 CY	1,770.00	73,278.00
0097	2220000000-E	838	REINFORCED ENDWALLS	24.3 CY	2,080.00	50,544.00
0098	2253000000-E	840	PIPE COLLARS	6.413 CY	2,260.00	14,493.38
0099	2264000000-E	840	PIPE PLUGS	1.504 CY	2,260.00	3,399.04
0100	2275000000-E	SP	FLOWABLE FILL	137 CY	413.00	,
0101	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	435 EA	3,520.00	
0102	2297000000-E	840	MASONRY DRAINAGE STRUCTURES	24.72 CY	2,230.00	55,125.60
0103			MASONRY DRAINAGE STRUCTURES	546.7 LF	560.00	306,152.00
0104		840	FRAME WITH TWO GRATES, STD 840.16	54 EA	960.00	51,840.00
0105	2364200000-N		FRAME WITH TWO GRATES, STD 840.20	41 EA	960.00	
0106	2365000000-N	840	840.22	172 EA	960.00	165,120.00
0107	2366000000-N		FRAME WITH TWO GRATES, STD 840.24	7 EA	960.00	

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	Contract Item Sheets For C204397								
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid			
0108	2367000000-N	840	FRAME WITH TWO GRATES, STD 840.29	1 EA	960.00	960.00			
 0109	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	7 EA	960.00	6,720.00			
0110	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	42 EA	960.00	40,320.00			
0111	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	31 EA	960.00	29,760.00			
0112	2396000000-N	840	FRAME WITH COVER, STD 840.54	41 EA	960.00	39,360.00			
0113	2407000000-N	840	STEEL FRAME WITH TWO GRATES, STD 840.37	15 EA	1,240.00	18,600.00			
0114	2451000000-N	852	CONCRETE TRANSITIONAL SECTION FOR DROP INLET	34 EA	1,460.00	49,640.00			
 0115	2462000000-E	836	**" SLUICE GATE (8")	2 EA	3,080.00	6,160.00			
0116	2473000000-N	SP	GENERIC DRAINAGE ITEM ENERGY DISSIPATOR BASIN	17 EA	14,500.00	246,500.00			
 0117	2535000000-E	846	**"X **" CONCRETE CURB (8" X 12")	230 LF	29.30	6,739.00			
0118	2549000000-E	846	2'-6" CONCRETE CURB & GUTTER	18,400 LF	30.00	552,000.00			
0119	2556000000-E	846	SHOULDER BERM GUTTER	5,310 LF	38.90	206,559.00			
0120			CONCRETE EXPRESSWAY GUTTER	750 LF	45.60	34,200.00			
0121	2591000000-E	848	4" CONCRETE SIDEWALK	5,480 SY	54.00				
0122	2605000000-N	848	CONCRETE CURB RAMPS	6 EA	2,250.00				
0123	2612000000-E	848	6" CONCRETE DRIVEWAY	560 SY	78.75	44,100.00			
0124	2619000000-E	850	4" CONCRETE PAVED DITCH	177 SY	90.00	15,930.00			
0125	2647000000-E	852	5" MONOLITHIC CONCRETE ISLANDS (SURFACE MOUNTED)	8,850 SY	73.00	646,050.00			

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	Contract Item Sheets For C204397								
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid			
0126	2655000000-E	852	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)	490 SY	74.75	36,627.50			
0127	2703000000-E	854	CONCRETE BARRIER, TYPE ****** (SINGLE SLOPE)	655 LF	145.00	94,975.00			
0128	2724000000-E	857	PRECAST REINFORCED CONCRETE BARRIER, SINGLE FACED	5,350 LF	102.00	545,700.00			
0129	2752000000-E	SP	GENERIC PAVING ITEM 2'-0" MODIFIED VALLEY GUTTER	360 LF	56.25	20,250.00			
0130	2759000000-N	SP	GENERIC PAVING ITEM VERTICAL CONCRETE BARRIER TRANSITION	2 EA	5,710.00	11,420.00			
0131	3001000000-N	SP	IMPACT ATTENUATOR UNITS, TYPE TL-3	2 EA	8,130.00	16,260.00			
0132	3030000000-E	862	STEEL BEAM GUARDRAIL	29,500 LF	26.90	793,550.00			
0133	3045000000-E	862	STEEL BEAM GUARDRAIL, SHOP CURVED	1,475 LF	28.60	42,185.00			
0134	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	30 EA	61.75	1,852.50			
0135	3195000000-N	862	GUARDRAIL END UNITS, TYPE AT-1	9 EA	1,010.00	9,090.00			
0136	3210000000-N	862	GUARDRAIL END UNITS, TYPE CAT-1	23 EA	1,040.00	23,920.00			
0137	3215000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE III	4 EA	2,470.00				
0138	3287000000-N		GUARDRAIL END UNITS, TYPE TL-3	44 EA	3,900.00	171,600.00			
0139	3288000000-N	SP		23 EA	1,040.00	23,920.00			
0140	3317000000-N		GUARDRAIL ANCHOR UNITS, TYPE B-77	20 EA	2,750.00				
0141	3360000000-E	863	REMOVE EXISTING GUARDRAIL	7,400 LF	1.10	8,140.00			
0142	3380000000-E	862	TEMPORARY STEEL BEAM GUARDRAIL	500 LF	7.85	3,925.00			
0143	3389150000-N	SP	TEMPORARY GUARDRAIL END UNITS, TYPE ***** (TL-3)	2 EA	2,470.00	4,940.00			

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			Contract Item Sheets For C2	04397		
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0144	3389400000-E	865	DOUBLE FACED CABLE GUIDERAIL	13,200 LF	11.15	147,180.00
0145	3389500000-N	865	ADDITIONAL GUIDERAIL POSTS	10 EA	86.25	862.50
0146	3389600000-N	865	CABLE GUIDERAIL ANCHOR UNITS	40 EA	1,850.00	74,000.00
0147	3435000000-N	SP	GENERIC GUARDRAIL ITEM PERMANENT BOLLARDS	6 EA	500.00	3,000.00
0148	3435000000-N	SP	GENERIC GUARDRAIL ITEM REMOVABLE BOLLARDS	3 EA	1,060.00	3,180.00
0149	3503000000-E	866	WOVEN WIRE FENCE, 47" FABRIC	60,960 LF	3.10	188,976.00
0150	3509000000-E	866	4" TIMBER FENCE POSTS, 7'-6" LONG	3,730 EA	22.40	83,552.00
0151	3515000000-E	866	5" TIMBER FENCE POSTS, 8'-0" LONG	1,170 EA	33.60	39,312.00
0152	3565000000-E	866	DOUBLE GATES, **" HIGH, **' WIDE, **' OPENING (47", 8', 16')	1 EA	2,020.00	2,020.00
0153	3575000000-E	SP	GENERIC FENCING ITEM BIKE AND PEDESTRIAN SAFETY RAIL	810 LF	170.00	137,700.00
0154	3628000000-E	876	RIP RAP, CLASS I	3,500 TON	58.00	203,000.00
0155	3635000000-E	876	RIP RAP, CLASS II	6,625 TON	60.00	397,500.00
0156	3649000000-E	876	RIP RAP, CLASS B	6,465 TON	45.80	296,097.00
0157	3656000000-E	876	GEOTEXTILE FOR DRAINAGE	44,475 SY	5.10	226,822.50
0158	4048000000-E	902	REINFORCED CONCRETE SIGN FOUN- DATIONS	12 CY	1,140.00	13,680.00
0159	4054000000-E	902	PLAIN CONCRETE SIGN FOUNDA- TIONS	2 CY	11.40	22.80
0160	4057000000-E	 SP	OVERHEAD FOOTING	30 CY	11.40	342.00
0161	4060000000-E	903	SUPPORTS, BREAKAWAY STEEL BEAM	4,817 LB	9.10	43,834.70

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		04397	Contract Item Sheets For C2			
Amount Bid	Unit Bid Price	Quantity Unit	Description	Sec #	ItemNumber	Line #
63,226.80	9.10	6,948 LB	SUPPORTS, SIMPLE STEEL BEAM	903	4066000000-E	0162
57,148.00	9.10	6,280 LF	SUPPORTS, 3-LB STEEL U-CHANNEL	903	4072000000-E	0163
1,140.00	114.00	10 EA	SUPPORTS, 2-LB STEEL U-CHANNEL	903	4078000000-E	0164
204,900.00	204,900.00	Lump Sum LS	SUPPORTS, OVERHEAD SIGN STRUC- TURE AT STA ****** (861+15 -L3-)	906	4082100000-N	0165
855.00	171.00	5 EA	SIGN ERECTION, TYPE D	904	4096000000-N	0166
28,899.75	85.25	339 EA	SIGN ERECTION, TYPE E	904	4102000000-N	0167
12,483.00	171.00	73 EA	SIGN ERECTION, TYPE F	904	4108000000-N	0168
3.45	1.15	3 EA	SIGN ERECTION, TYPE *** (OVER- HEAD) (A)	904	4109000000-N	0169
2.30	1.15	2 EA	SIGN ERECTION, TYPE *** (OVER- HEAD) (B)	904	4109000000-N	0170
16,380.00	910.00	18 EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)	904	4110000000-N	0171
4,095.00	455.00	9 EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B)	904	4110000000-N	0172
1,539.00	171.00	9 EA	SIGN ERECTION, MILEMARKERS	904	4114000000-N	0173
684.00	228.00	3 EA	SIGN ERECTION, RELOCATE TYPE **** (GROUND MOUNTED) (D)	904	4116100000-N	0174
684.00	228.00	3 EA	SIGN ERECTION, RELOCATE TYPE ***** (GROUND MOUNTED) (E)	904	4116100000-N	0175
456.00	228.00	2 EA	SIGN ERECTION, RELOCATE TYPE **** (GROUND MOUNTED) (F)	904	4116100000-N	 0176
213.90	2.30	93 EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	907	4155000000-N	 0177

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			Contract Item Sheets For C20	4397		
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0178	4192000000-N	907	DISPOSAL OF SUPPORT, U-CHANNEL	4 EA	2.30	9.20
0179	4238000000-N	907	DISPOSAL OF SIGN, D, E OR F	12 EA	2.30	27.60
0180	4370000000-N	SP	GENERIC SIGNING ITEM DISPOSAL OF FLASHER SYSTEM	Lump Sum LS	1,600.00	1,600.00
0181	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	1,906 SF	7.70	14,676.20
0182	4405000000-E	1110	WORK ZONE SIGNS (PORTABLE)	672 SF	29.30	19,689.60
0183	4410000000-E	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	432 SF	6.95	3,002.40
0184	4415000000-N	1115	FLASHING ARROW BOARD	2 EA	3,310.00	6,620.00
0185	4420000000-N	1120	PORTABLE CHANGEABLE MESSAGE SIGN	2 EA	13,800.00	27,600.00
0186	4430000000-N	1130	DRUMS	920 EA	54.25	49,910.00
0187	443400000-N	SP	SEQUENTIAL FLASHING WARNING LIGHTS	30 EA	148.00	4,440.00
0188	4435000000-N	1135	CONES	50 EA	23.60	1,180.00
0189	4445000000-E	1145	BARRICADES (TYPE III)	352 LF	28.40	9,996.80
0190	4447000000-E	SP	PEDESTRIAN CHANNELIZING DE- VICES	128 LF	39.00	4,992.00
0191	4455000000-N		FLAGGER	550 DAY	385.00	211,750.00
0192	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	2 EA	6,480.00	12,960.00
0193	4470000000-N	1160	REMOVE & RESET TEMPORARY CRASH CUSHION	2 EA	3,300.00	6,600.00
0194	4480000000-N	1165	TMA	2 EA	48,400.00	96,800.00
0195	4485000000-E	1170	PORTABLE CONCRETE BARRIER	1,800 LF	38.70	69,660.00
0196	4500000000-E	1170	REMOVE AND RESET PORTABLE CON- CRETE BARRIER	1,800 LF	6.90	12,420.00

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		4397	Contract Item Sheets For C20			
Amount Bid	Unit Bid Price	Quantity Unit	Description	Sec #	ItemNumber	Line #
04.750.00	00.50	700	WATER EILLER RARRIER	4470	450700000 5	0.407
64,750.00	92.50	700 LF	WATER FILLED BARRIER	1170	4507000000-E	0197
12,285.00	17.55	700 LF	REMOVE AND RESET WATER FILLED BARRIER	SP	4508000000-E	0198
4,240.00	66.25	64 HR	LAW ENFORCEMENT	1190	4510000000-N	0199
4,422.00	40.20	110 EA	SKINNY DRUM	1180	4516000000-N	0200
5,100.00	75.00	68 EA	TUBULAR MARKERS (FIXED)	1266	4520000000-N	0201
14,319.30	8.85	1,618 EA	TEMPORARY RAISED PAVEMENT MARKERS	1251	4650000000-N	0202
2,952.25	1.75	1,687 LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)	1205	4695000000-E	0203
4,004.00	154.00	26 EA	THERMOPLASTIC PAVEMENT MARKING CHARACTER (90 MILS)	1205	4720000000-E	0204
42,593.00	191.00	223 EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	1205	4725000000-E	0205
14,014.00	7.15	1,960 LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)	1205	4770000000-E	0206
2,672.70	8.85	302 LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (6") (IV)	1205	4775000000-E	0207
2,820.00	1,410.00	2 EA	COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (I)	1205	4805000000-N	0208
74,056.25	0.25	296,225 LF	PAINT PAVEMENT MARKING LINES (4")	1205	4810000000-E	0209
5,886.50	0.25	23,546 LF	PAINT PAVEMENT MARKING LINES (6")	1205	4815000000-E	0210
1,680.00	1.20	1,400 LF	PAINT PAVEMENT MARKING LINES (8")	1205	4820000000-E	0211
1,180.80	2.05	576 LF	PAINT PAVEMENT MARKING LINES (12")	1205	4825000000-E	0212
1,309.00	1.70	770 LF	PAINT PAVEMENT MARKING LINES (24")	1205	4835000000-E	0213

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			Contract Item Sheets For C20	4397		
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0214	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	76 EA	71.00	5,396.00
0215	4850000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (4")	32,600 LF	1.35	44,010.00
 0216	4860000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (8")	400 LF	2.95	1,180.00
 0217	4870000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (24")	 110 LF	11.25	1,237.50
 0218	4875000000-N	1205	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS	 12 EA	106.00	1,272.00
 0219	4890000000-E	SP	GENERIC PAVEMENT MARKING ITEM POLYUREA PAVEMENT MARKING LINES, 12" 20 MILS (STANDARD GLASS BEADS)	10,194 LF	2.35	23,955.90
 0220	4890000000-E	SP	GENERIC PAVEMENT MARKING ITEM POLYUREA PAVEMENT MARKING LINES, 4", 20 MILS (STANDARD GLASS BEADS)	86,125 LF	0.85	73,206.25
 0221	4890000000-E	SP	GENERIC PAVEMENT MARKING ITEM POLYUREA PAVEMENT MARKING LINES, 6", 20 MILS (STANDARD GLASS BEADS)	112,564 LF	0.90	101,307.60
 0222	4890000000-E	SP	GENERIC PAVEMENT MARKING ITEM POLYUREA PAVEMENT MARKING LINES, 8", 20 MILS (STANDARD GLASS BEADS)	1,844 LF	3.25	5,993.00
 0223	4891000000-E	1205	GENERIC PAVEMENT MARKING ITEM THERMOPLASTIC PAVEMENT MARKING LINES (24", 90 MILS)	430 LF	5.90	2,537.00
 0224	4895000000-N	SP	GENERIC PAVEMENT MARKING ITEM NON-CAST IRON SNOWPLOWABLE PAVEMENT MARKER	1,606 EA	53.25	85,519.50
 0225	4900000000-N	1251	PERMANENT RAISED PAVEMENT MARKERS	8 EA	29.60	236.80
 0226	4915000000-E	1264	7' U-CHANNEL POSTS	48 EA	74.00	3,552.00
0227	4955000000-N	1264	OBJECT MARKERS (END OF ROAD)	54 EA	96.75	5,224.50
0228	5325200000-E	1510	2" WATER LINE	1,350 LF	67.00	90,450.00

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			Contract Item Sheets For	r C204397		
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0229	5325600000-E	1510	6" WATER LINE	2,515 LF	120.00	301,800.00
0230	5325800000-E	1510	8" WATER LINE	960 LF	116.00	111,360.00
0231	5326000000-E	1510	10" WATER LINE	5,790 LF	120.00	694,800.00
0232	5326200000-E	1510	12" WATER LINE	3,130 LF	139.00	435,070.00
0233	5329000000-E	1510	DUCTILE IRON WATER PIPE FITTINGS	8,349 LB	7.70	64,287.30
0234	5536000000-E	1515	2" VALVE	5 EA	1,500.00	7,500.00
0235	5540000000-E	1515	6" VALVE	35 EA	2,060.00	72,100.00
0236	5546000000-E	1515	8" VALVE	4 EA	2,870.00	11,480.00
0237	5552000000-E	1515	10" VALVE	22 EA	4,250.00	93,500.00
0238	5558000000-E	1515	12" VALVE	6 EA	5,370.00	32,220.00
0240	5571600000-E	1515	6" TAPPING SLEEVE & VALVE	1 EA	9,250.00	9,250.00
0241	5606000000-E	1515	2" BLOW OFF	5 EA	2,510.00	12,550.00
0242	5648000000-N	1515	RELOCATE WATER METER	9 EA	1,110.00	9,990.00
0243	5649000000-N	1515	RECONNECT WATER METER	12 EA	,	15,360.00
0244	5666000000-N	1515		2 EA	5,010.00	10,020.00
0245			RELOCATE FIRE HYDRANT	15 EA		11,700.00
	5691300000-E	1520	8" SANITARY GRAVITY SEWER	7,698.23 LF		1,647,421.22
0247	5691400000-E	1520	10" SANITARY GRAVITY SEWER	1,888.1 LF	230.00	434,263.00
0248			12" SANITARY GRAVITY SEWER	1,337.25 LF		
0249	5709200000-E	1520	4" FORCE MAIN SEWER	3,117 LF	356.00	1,109,652.00
0250	5709400000-E	1520	8" FORCE MAIN SEWER	310 LF	530.00	164,300.00

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			Contract Item Sheets For C2	04397		
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0251	5775000000-E	1525	4' DIA UTILITY MANHOLE	43 EA	4,500.00	193,500.00
0252	5801000000-E	1530	ABANDON 8" UTILITY PIPE	4,983.8 LF	18.40	91,701.92
0253	5802000000-E	1530	ABANDON 10" UTILITY PIPE	4,827 LF	17.75	85,679.25
0254	5804000000-E	1530	ABANDON 12" UTILITY PIPE	584 LF	21.70	12,672.80
0255	5815000000-N	1530	REMOVE WATER METER	26 EA	271.00	7,046.00
0256	5835700000-E	1540	16" ENCASEMENT PIPE	270 LF	250.00	67,500.00
0257	5835800000-E	1540	18" ENCASEMENT PIPE	1,468 LF	309.00	453,612.00
0258	5836000000-E	1540	24" ENCASEMENT PIPE	1,386 LF	332.00	460,152.00
0259	6000000000-E	1605	TEMPORARY SILT FENCE	143,000 LF	3.00	429,000.00
0260	6006000000-E	1610	STONE FOR EROSION CONTROL, CLASS A	8,860 TON	46.00	407,560.00
0261	6009000000-E	 1610	STONE FOR EROSION CONTROL, CLASS B	40,810 TON	45.00	1,836,450.00
0262	6012000000-E	1610	SEDIMENT CONTROL STONE	 19,350 TON	44.30	857,205.00
0263	6015000000-E	1615	TEMPORARY MULCHING	711 ACR	970.00	689,670.00
0264	6018000000-E	1620	SEED FOR TEMPORARY SEEDING	27,700 LB	3.60	99,720.00
0265	6021000000-E	1620	FERTILIZER FOR TEMPORARY SEED- ING	141.5 TON	2,010.00	284,415.00
0266		1622	TEMPORARY SLOPE DRAINS	 28,125 LF	16.80	472,500.00
0267	6029000000-E	SP		11,320 LF	2.20	24,904.00
0268	6030000000-E	1630	SILT EXCAVATION	250,750 CY	0.01	2,507.50
0269	6036000000-E		MATTING FOR EROSION CONTROL	892,500 SY		1,294,125.00
0270	6037000000-E	SP	COIR FIBER MAT	2,640 SY	8.05	21,252.00

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			Contract Item Sheets For C2	04397		
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0271	6038000000-E	SP	PERMANENT SOIL REINFORCEMENT MAT	32,000 SY	4.10	131,200.00
0272	6042000000-E	1632	1/4" HARDWARE CLOTH	22,655 LF	7.50	169,912.50
0273	6045000000-E	SP	**" TEMPORARY PIPE (36")	135 LF	193.00	26,055.00
0274	6046000000-E	1636	TEMPORARY PIPE FOR STREAM CROSSING	 125 LF	85.50	10,687.50
0275	6069000000-E	1638	STILLING BASINS	210 CY	27.60	5,796.00
0276	6070000000-N	1639	SPECIAL STILLING BASINS	10 EA	1,500.00	15,000.00
0277	6071012000-E	SP	COIR FIBER WATTLE	 14,930 LF	11.05	164,976.50
0278	6071013000-E	SP	WATTLE BARRIER	31,250 LF	14.35	448,437.50
0279	6071020000-E	SP	POLYACRYLAMIDE (PAM)	 17,715 LB	13.25	234,723.75
0280	6071030000-E	1640	COIR FIBER BAFFLE	27,830 LF	7.75	215,682.50
0281	6071050000-E	SP	**" SKIMMER (1-1/2")	75 EA	5,770.00	432,750.00
0282	6071050000-E	SP	**" SKIMMER (2")	18 EA	8,630.00	155,340.00
0283	6071050000-E	SP	**" SKIMMER (2-1/2")	13 EA	11,400.00	148,200.00
0284	6071050000-E	SP	**" SKIMMER (3")	1 EA	14,800.00	14,800.00
0285	6084000000-E	1660	SEEDING & MULCHING	365 ACR	2,180.00	795,700.00
0286	6087000000-E	1660	MOWING	251 ACR	121.00	30,371.00
0287	6090000000-E	1661	SEED FOR REPAIR SEEDING	7,250 LB	11.05	80,112.50
0288	6093000000-E	1661	FERTILIZER FOR REPAIR SEEDING	19.25 TON	1,600.00	30,800.00
0289	6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	9,500 LB	4.40	41,800.00

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			Contract Item Sheets For C2	04397		
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0290	6108000000-E	1665	FERTILIZER TOPDRESSING	283.75 TON	2,010.00	570,337.50
0291	6111000000-E	SP	IMPERVIOUS DIKE	770 LF	88.25	67,952.50
0292	6114500000-N	1667	SPECIALIZED HAND MOWING	180 MHR	82.75	14,895.00
0293	6117000000-N	SP	RESPONSE FOR EROSION CONTROL	150 EA	0.01	1.50
0294	6117500000-N	SP	CONCRETE WASHOUT STRUCTURE	32 EA	1,600.00	51,200.00
0295	6120000000-E	SP	CULVERT DIVERSION CHANNEL	1,010 CY	14.10	14,241.00
0296	6132000000-N	SP	GENERIC EROSION CONTROL ITEM FABRIC INSERT INLET PROTECTION DEVICE CLEANOUT	100 EA	166.00	16,600.00
 0297	6132000000-N	SP	GENERIC EROSION CONTROL ITEM FABRIC INSERT INLET PROTECTION DEVICE	33 EA	204.00	6,732.00
0298	7048500000-E	1705	PEDESTRIAN SIGNAL HEAD (16", 1 SECTION W/COUNTDOWN)	4 EA	1,100.00	4,400.00
0299	7060000000-E	1705	SIGNAL CABLE	7,500 LF	3.30	24,750.00
0300	7120000000-E	1705	VEHICLE SIGNAL HEAD (12", 3 SECTION)	32 EA	1,100.00	35,200.00
0301	7132000000-E	1705	VEHICLE SIGNAL HEAD (12", 4 SECTION)	11 EA	1,210.00	13,310.00
0302	7144000000-E	1705	VEHICLE SIGNAL HEAD (12", 5 SECTION)	3 EA	1,660.00	4,980.00
0303	7264000000-E	1710	MESSENGER CABLE (3/8")	550 LF	6.60	3,630.00
0304	7300000000-E	1715	UNPAVED TRENCHING (********) (1, 2")	550 LF	13.25	7,287.50
0305	7300000000-E	1715	UNPAVED TRENCHING (********) (2, 2")	405 LF	16.55	6,702.75
0306	7300000000-E	1715	UNPAVED TRENCHING (********) (4, 2")	310 LF	24.30	7,533.00
0307	7301000000-E	1715	DIRECTIONAL DRILL (*********) (1, 2")	200 LF	17.65	3,530.00

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		Contract Item Sheets For C2	104337		
ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
7301000000-E	1715	DIRECTIONAL DRILL (********) (2, 2")	575 LF	26.50	15,237.50
7301000000-E	1715	DIRECTIONAL DRILL (********) (3, 2")	100 LF	32.00	3,200.00
7301000000-E	1715	DIRECTIONAL DRILL (********) (4, 2")	275 LF	39.70	10,917.50
7301000000-E	1715	DIRECTIONAL DRILL (*********) (5, 2")	150 LF	47.50	7,125.00
7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	8 EA	660.00	5,280.00
7348000000-N	1716	JUNCTION BOX (OVER-SIZED, HEA- VY DUTY)	10 EA	1,050.00	10,500.00
7360000000-N	1720	WOOD POLE	4 EA	1,100.00	4,400.00
7372000000-N	1721	GUY ASSEMBLY	7 EA	610.00	4,270.00
7408000000-E	1722	1" RISER WITH WEATHERHEAD	2 EA	830.00	1,660.00
7420000000-E	1722	2" RISER WITH WEATHERHEAD	3 EA	1,050.00	3,150.00
7444000000-E	1725	INDUCTIVE LOOP SAWCUT	3,600 LF	12.40	44,640.00
7456000000-E	1726	LEAD-IN CABLE (*************) (14-2)	11,000 LF	2.75	30,250.00
7481000000-N	SP	SITE SURVEY	1 EA	1,930.00	1,930.00
7481240000-N	SP	CAMERA WITHOUT INTERNAL LOOP EMULATOR PROCESSING UNIT	3 EA	4,640.00	13,920.00
7481260000-N	SP	EXTERNAL LOOP EMULATOR PRO- CESSING UNIT	1 EA	7,180.00	7,180.00
7575142010-N	1736	900MHZ SERIAL/ETHERNET SPREAD SPECTRUM RADIO	10 EA	4,860.00	48,600.00
7588000000-N	SP	METAL POLE WITH SINGLE MAST ARM	10 EA	20,400.00	204,000.00
7590000000-N	SP	METAL POLE WITH DUAL MAST ARM	2 EA	27,500.00	55,000.00
	7301000000-E 7301000000-E 7301000000-E 7301000000-E 7324000000-N 7348000000-N 7360000000-N 7408000000-E 742000000-E 7444000000-E 7481000000-E 7481240000-N 7575142010-N 7588000000-N	7301000000-E 1715 7301000000-E 1715 7301000000-E 1715 7301000000-E 1715 7324000000-N 1716 7348000000-N 1716 7360000000-N 1720 7372000000-N 1721 7408000000-E 1722 742000000-E 1722 7444000000-E 1725 7456000000-E 1726 7481240000-N SP 7481260000-N SP 7481260000-N SP	ItemNumber Sec # Description 7301000000-E 1715 DIRECTIONAL DRILL (""""") 7324000000-N 1716 JUNCTION BOX (STANDARD SIZE) 7348000000-N 1716 JUNCTION BOX (OVER-SIZED, HEA-VY DUTY) 7360000000-N 1720 WOOD POLE 7372000000-N 1721 GUY ASSEMBLY 7408000000-E 1722 1" RISER WITH WEATHERHEAD 7444000000-E 1722 2" RISER WITH WEATHERHEAD 7444000000-E 1726 LEAD-IN CABLE (""""") 7481000000-N SP SITE SURVEY 7481240000-N SP CAMERA WITHOUT INTERNAL LOOP EMULATOR PROCESSING UNIT 7481260000-N SP EXTERNAL LOOP EMULATOR PROCESSING UNIT 7575142010-N 1736 900MHZ SERIAL/ETHERNET SPREAD SPECTRUM RADIO 7588000000-N SP METAL POLE WITH SINGLE MAST ARM	TemNumber Sec Description Quantity Unit	

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		04397	Contract Item Sheets For C2			
Amoun Bio	Unit Bid Price	Quantity Unit	Description	Sec #	ItemNumber	Line #
19,200.00	1,600.00	12 EA	SOIL TEST	SP	7613000000-N	0326
92,400.00	1,100.00	84 CY	DRILLED PIER FOUNDATION	SP	7614100000-E	0327
1,320.00	110.00	12 EA	MAST ARM WITH METAL POLE DE- SIGN	SP	7631000000-N	0328
3,864.00	276.00	14 EA	SIGN FOR SIGNALS	 1745	7636000000-N	0329
16,240.00	2,320.00	7 EA	TYPE II PEDESTAL WITH FOUND- ATION	1743	7642200000-N	0330
8,840.00	2,210.00	4 EA	SIGNAL CABINET FOUNDATION	1750	7684000000-N	0331
70,800.00	17,700.00	4 EA	CONTROLLERS WITH CABINET (**************************) (2070E, BASE MOUNTED)	1751	7696000000-N	0332
6,072.00	276.00	22 EA	DETECTOR CARD (TYPE 170)	1751	7744000000-N	0333
2,440.00	610.00	4 EA	CABINET BASE EXTENDER	1753	7901000000-N	0334
2,760.00	2,760.00	1 EA	TRAFFIC SIGNAL REMOVAL	1757	7948000000-N	0335
3,860.00	3,860.00	1 EA	METAL POLE FOUNDATION REMOVAL	SP	7960000000-N	0336
1,660.00	1,660.00	1 EA	METAL POLE REMOVAL	SP	7972000000-N	0337
27,840.00	4,640.00	6 EA	GENERIC SIGNAL ITEM 2070E CONTROLLER	SP	7980000000-N	0338
4,180.00	2,090.00	2 EA	GENERIC SIGNAL ITEM PROTECTIVE COATING FOR DUAL MAST ARM POLE (BLACK)	SP	798000000-N	0339
770.00	110.00	7 EA	GENERIC SIGNAL ITEM PROTECTIVE COATING FOR SIGNAL PEDESTAL (BLACK)	SP	7980000000-N	0340
13,800.00	1,380.00	10 EA	GENERIC SIGNAL ITEM PROTECTIVE COATING FOR SINGLE MAST ARM POLE (BLACK)	SP	7980000000-N	0341
28,295.7	92.50	305.9 LF	FIRE HYDRANT LEG	1515	5673000000-E	0392
8,972.83	94.75	94.7 LF	**" WATER SERVICE LINE (2")	1515	5686000000-E	0393

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	Contract Item Sheets For C204397						
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid	
0394	5776000000-E	1525	5' DIA UTILITY MANHOLE	19 EA	7,270.00	138,130.00	
0395	5781000000-E	1525	UTILITY MANHOLE WALL 4' DIA	139 LF	320.00	44,480.00	
0396	5782000000-E	1525	UTILITY MANHOLE WALL 5' DIA	215 LF	436.00	93,740.00	
0397	5912000000-N	SP	GENERIC UTILITY ITEM UTILITY COORDINATOR	Lump Sum LS	745,200.00	745,200.00	
0398	0973100000-E	330	**" WELDED STEEL PIPE, ****" THICK, GRADE B IN SOIL (36", 0.500")	346 LF	850.00	294,100.00	
0399	0973300000-E	330	**" WELDED STEEL PIPE, ****" THICK, GRADE B NOT IN SOIL (42", 0.625")	276 LF	2,380.00	656,880.00	
0400	0973300000-E	330	**" WELDED STEEL PIPE, ****" THICK, GRADE B NOT IN SOIL (66", 0.875")	122 LF	2,620.00	319,640.00	
0401	3575000000-E	SP	GENERIC FENCING ITEM ORNAMENTAL WOOD FENCE	100 LF	140.00	14,000.00	
0402	436000000-N	SP	GENERIC SIGNING ITEM RRFB ASSEMBLY	4 EA	9,380.00	37,520.00	
0403	436000000-N	SP	GENERIC SIGNING ITEM ADVANCE WARNING FLASHING BEA- CON ASSEMBLY	3 EA	8,610.00	25,830.00	

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Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0342	8056000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION ************************************	Lump Sum LS	38,600.00	38,600.00
0343	8065000000-N	SP	ASBESTOS ASSESSMENT	Lump Sum LS	1,320.00	1,320.00
0344	8126000000-N	414	CULVERT EXCAVATION, STA ****** (735+38.59 -L3-)	Lump Sum LS	247,200.00	247,200.00
0345	8126000000-N	414	CULVERT EXCAVATION, STA ****** (797+66.00 -L3-)	Lump Sum LS	130,100.00	130,100.00
0346	8126000000-N	414	CULVERT EXCAVATION, STA ****** (830+02.00 -L3-)	Lump Sum LS	278,700.00	278,700.00
0347	8126000000-N	414	CULVERT EXCAVATION, STA ****** (874+45.00 -L3-)	Lump Sum LS	92,100.00	92,100.00
0348	8133000000-E	414	FOUNDATION CONDITIONING MATER- IAL, BOX CULVERT	2,287 TON	82.75	189,249.25
0349	8196000000-E	420	CLASS A CONCRETE (CULVERT)	5,708.1 CY	442.00	2,522,980.20
0350	8245000000-E	425	REINFORCING STEEL (CULVERT)	920,565 LB	1.55	1,426,875.75
0351	8590000000-E	876	RIP RAP, CLASS ** (II)	32 TON	72.75	2,328.00
0352	8622000000-E	 876	GEOTEXTILE FOR DRAINAGE	 1,695	5.10	8,644.50

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	Contract Item Sheets For C204397						
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid	
0353	8504000000-E	460	CONCRETE BARRIER RAIL WITH MOMENT SLAB	268 LF	451.00	120,868.00	
0354	8801000000-E	SP	MSE RETAINING WALL NO **** (1)	6,350 SF	94.75	601,662.50	
0355	8801000000-E	SP	MSE RETAINING WALL NO **** (2)	4,335 SF	116.00	502,860.00	
0356	8801000000-E	SP	MSE RETAINING WALL NO **** (6)	4,665 SF	101.00	471,165.00	
0357	8847000000-E	SP	GENERIC RETAINING WALL ITEM ARCHITECTURAL SURFACE TREAT- MENT	149,026 SF	2.35	350,211.10	
0358	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW11-	18,303 SF	39.10	715,647.30	
0359	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW13-	26,005 SF	39.10	1,016,795.50	
0360	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW15-	7,308 SF	39.30	287,204.40	
0361	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW5A-	14,210 SF	39.10	555,611.00	
0362	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW5B-	8,208 SF	39.10	320,932.80	
0363	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO -NW8-	18,010 SF	39.30	707,793.00	

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Contract Item Sheets For C204397							
ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid		
8091000000-N	410	FOUNDATION EXCAVATION FOR BENT ** AT STATION ************************************	Lump Sum LS	22,200.00	22,200.00		
8105560000-E	411	4'-0" DIA DRILLED PIERS IN SOIL	50 LF	1,040.00	52,000.00		
8105660000-E	411	4'-0" DIA DRILLED PIERS NOT IN SOIL	50 LF	1,040.00	52,000.00		
8115000000-N	411	CSL TESTING	1 EA	3,860.00	3,860.00		
8147000000-E	420	REINFORCED CONCRETE DECK SLAB	38,861 SF	42.30	1,643,820.30		
8161000000-E	420	GROOVING BRIDGE FLOORS	40,654 SF	0.50	20,327.00		
8182000000-E	420	CLASS A CONCRETE (BRIDGE)	601.6 CY	1,420.00	854,272.00		
8210000000-N	422	BRIDGE APPROACH SLABS, STATION *******************(20+88.94 -Y19-)	Lump Sum LS	55,100.00	55,100.00		
8210000000-N	422	BRIDGE APPROACH SLABS, STATION ************************************	Lump Sum LS	110,600.00	110,600.00		
8210000000-N	422	BRIDGE APPROACH SLABS, STATION ************************************	Lump Sum LS	66,200.00	66,200.00		
8210000000-N	422	BRIDGE APPROACH SLABS, STATION ************************************	Lump Sum LS	66,200.00	66,200.00		
8217000000-E	425	REINFORCING STEEL (BRIDGE)	98,466 LB	1.30	128,005.80		
8238000000-E	425	SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	7,072 LB	2.70	19,094.40		
8265000000-E	430	54" PRESTRESSED CONCRETE GIR- DERS	2,104.67 LF	361.00	759,785.87		
8277000000-E	430	MODIFIED 72" PRESTRESSED CONC GIRDERS	2,254.9 LF	399.00	899,705.10		
8328200000-E	450	PILE DRIVING EQUIPMENT SETUP FOR *** STEEL PILES (HP 12 X 53)	72 EA	484.00	34,848.00		
	8091000000-N 8105560000-E 8105660000-E 8115000000-N 8147000000-E 8182000000-E 8210000000-N 8210000000-N 8217000000-N 8217000000-E 8238000000-E 8238000000-E	# 8091000000-N 410 8105560000-E 411 8105660000-E 411 8147000000-E 420 8161000000-E 420 8182000000-E 420 8210000000-N 422 8210000000-N 422 8210000000-N 422 8210000000-N 422 8210000000-N 422 8210000000-N 422 8217000000-E 425 8238000000-E 430	No. No.	RemNumber Sec	No. No.		

Jan 04, 2022 12:46 pm

North Carolina Department Of Transportation Contract Item Sheets For C204397

	Contract Item Sheets For C204397					
Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0380	8328200000-E	450	PILE DRIVING EQUIPMENT SETUP FOR *** STEEL PILES (HP 14 X 73)	30 EA	399.00	11,970.00
0381	8364000000-E	450	HP12X53 STEEL PILES	4,005 LF	72.75	291,363.75
0382	8384000000-E	450	HP14X73 STEEL PILES	940 LF	97.00	91,180.00
0383	8391000000-N	450	STEEL PILE POINTS	18 EA	420.00	7,560.00
0384	8392500000-E	450	PREDRILLING FOR PILES	170 LF	161.00	27,370.00
0385	8475000000-E	460	TWO BAR METAL RAIL	496.77 LF	120.00	59,612.40
0386	8482000000-E	460	THREE BAR METAL RAIL	343.92 LF	188.00	64,656.96
0387	8503000000-E	460	CONCRETE BARRIER RAIL	407.2 LF	154.00	62,708.80
0388	8505000000-E	460	VERTICAL CONCRETE BARRIER RAIL	277.14 LF	130.00	36,028.20
0389	8517000000-E	460	1'-**"X *****" CONCRETE PARA- PET (1'-2" X 2'-6")	504.55 LF	113.00	57,014.15
0390	8531000000-E	462	4" SLOPE PROTECTION	2,278 SY	90.00	205,020.00
0391	8657000000-N	430	ELASTOMERIC BEARINGS	Lump Sum LS	23,500.00	23,500.00

TOTAL AMOUNT OF BID FOR ENTIRE PROJECT

\$109,237,300.02

Page: 24 of 24

1246/Jan04/Q8058575.367/D1777759787010/E402

C204397	
Contract No.	
County Rutherford	

Rev. 1-16-18

EXECUTION OF CONTRACT NON-COLLUSION, DEBARMENT AND GIFT BAN CERTIFICATION

CORPORATION

The Contractor declares (or certifies, verifies, or states) under penalty of perjury under the laws of the United States that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with this Contract, that the Contractor has not been convicted of violating N.C.G.S. § 133-24 within the last three years, and that the Contractor intends to do the work with its own bonafide employees or subcontractors and did not bid for the benefit of another contractor.

By submitting this Execution of Contract, Non-Collusion and Debarment Certification, the Contractor is certifying his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF CONTRACTOR

Full name of Corporation

P.O. Box 437, Charleston, TN 37310

Address as Prequalified

Select appropriate title

Bv

ice President/A

Select appropriate title

Penny W. Ragland, Secretary

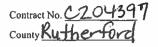
Print or type Signer's name

J. Mitchell Simpson, COO / Exec. V.P.

Print or type Signer's name

CORPORATE SEAL





DEBARMENT CERTIFICATION

Conditions for certification:

- 1. The prequalified bidder shall provide immediate written notice to the Department if at any time the bidder learns that his certification was erroneous when he submitted his debarment certification or explanation filed with the Department, or has become erroneous because of changed circumstances.
- 2. The terms covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, person, primary covered transaction, principal, proposal, and voluntarily excluded, as used in this provision, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. A copy of the Federal Rules requiring this certification and detailing the definitions and coverages may be obtained from the Contract Officer of the Department.
- 3. The prequalified bidder agrees by submitting this form, that he will not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in NCDOT contracts, unless authorized by the Department.
- 4. For Federal Aid projects, the prequalified bidder further agrees that by submitting this form he will include the Federal-Aid Provision titled Required Contract Provisions Federal-Aid Construction Contract (Form FHWA PR 1273) provided by the Department, without subsequent modification, in all lower tier covered transactions.
- 5. The prequalified bidder may rely upon a certification of a participant in a lower tier covered transaction that he is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless he knows that the certification is erroneous. The bidder may decide the method and frequency by which he will determine the eligibility of his subcontractors.
- 6. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this provision. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- 7. Except as authorized in paragraph 6 herein, the Department may terminate any contract if the bidder knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available by the Federal Government.

DEBARMENT CERTIFICATION

The prequalified bidder certifies to the best of his knowledge and belief, that he and his principals:

- a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- b. Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records; making false statements; or receiving stolen property;
- c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph b. of this certification; and
- d. Have not within a three-year period preceding this proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
- e. Will submit a revised Debarment Certification immediately if his status changes and will show in his bid proposal an explanation for the change in status.

If the prequalified bidder cannot certify that he is not debarred, he shall provide an explanation with this submittal. An explanation will not necessarily result in denial of participation in a contract.

Failure to submit a non-collusion and debarment certification will result in the prequalified bidder's bid being considered non-responsive.

Ш	Check here if an	explanation is	attached to	this certification.

Contract No. <u>C204397</u>
County (ies): <u>Rutherford</u>
ACCEPTED BY THE DEPARTMENT OF TRANSPORTATION
Pocusigned by: Ronald E. Davenport, Jr.
Contract Officer
01/20/2022
Date
Execution of Contract and Bonds Approved as to Form:
DocuSigned by:
Attorney General

01/20/2022

Date

Contract No.

C204397	
Rutherford	

BOND NUMBER: 018227664

CONTRACT PAYMENT BOND

Date of Payment Bond Execution	January 4, 2022
Name of Principal Contractor	Wright Brothers Construction Company, Inc.
Name of Surety:	Liberty Mutual Insurance Company
Name of Contracting Body:	North Carolina Department of Transportation
	Raleigh, North Carolina
Amount of Bond:	\$109,237,300.02
Contract ID No.:	C204397
County Name:	Rutherford
=	

KNOW ALL MEN BY THESE PRESENTS, That we, the PRINCIPAL CONTRACTOR (hereafter, PRINCIPAL) and SURETY above named, are held and firmly bound unto the above named Contracting Body, hereinafter called the Contracting Body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the Contracting Body, numbered as shown above and hereto attached:

NOW THEREFORE, if the principal shall promptly make payment to all persons supplying labor and material in the prosecution of the work provided for in said contract, and any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

CONTRACT PAYMENT BOND

Affix Seal of Surety Company

Liberty Mutual Insurance Company

Print or type Surety Company Name



By Elizabeth A. Hartzberg, Attorney-in-Fact

Print, stamp or type name of Attorney-in-Fact

Elizabeth a Maistrace Signature of Attorney-in-Facto

Signature of Witness

Maria Concepcion

Print or type Signer's name

1801 West End Ave., Nashville, TN 37203

Address of Attorney-in-Fact

CONTRACT PAYMENT BOND

CORPORATION

SIGNATURE OF CONTRACTOR (Principal)

Wright Brothers Construction Company, Inc.

Full name of Corporation

P.O. Box 437 Charleston TN 37310

Address as prequalified

Βv

Signature of President, Vice President, Assistant Vice President
Select appropriate title

Print or type Signer's name

Affix Corporate Seal

Attest

Signature of Secretary, Assistant Secretary
Select appropriate title

Print or type Signer's name

BOND NUMBER: 018227664

CONTRACT PERFORMANCE BOND

Date of Performance Bond Execution:

Name of Principal Contractor:

Name of Surety:

Name of Contracting Body:

Morth Carolina Department of Transportation

Raleigh, North Carolina

Street:

Contract ID No.:

County Name:

Panuary 4, 2022

Wright Brothers Construction Company, Inc.

Liberty Mutual Insurance Company

North Carolina Department of Transportation

Raleigh, North Carolina

\$109,237,300.02

C204397

Rutherford

KNOW ALL MEN BY THESE PRESENTS, That we, the PRINCIPAL CONTRACTOR (hereafter, PRINCIPAL) and SURETY above named, are held and firmly bound unto the above named Contracting Body, hereinafter called the Contracting Body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the Contracting Body, numbered as shown above and hereto attached:

NOW THEREFORE, if the principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the Contracting Body, with or without notice to the Surety, and during the life of any guaranty required under the contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Rutherfo

CONTRACT PERFORMANCE BOND

Affix Seal of Surety Company

Liberty Mutual Insurance Company

Print or type Surety Company Name



By Elizabeth A. Hartzberg, Attorney-in-Fact

Print, stamp or type name of Attorney-in-Fact

Elizabeth Commey-in-Facts
Signature of Attorney-in-Facts

Signature of Witness

Maria Concepcion

Print or type Signer's name

1801 West End Ave., Nashville, TN 37203

Address of Attorney-in-Fact

CONTRACT PERFORMANCE BOND

CORPORATION

SIGNATURE OF CONTRACTOR (Principal)

Wright Brothers Construction Company, Inc.

Full name of Corporation

P.O. Box 437 Charleston TN 87310

Address as prequalified

Βv

Signature of President, Vice President, Assistant Vice President

Select appropriate title

Print or type Signer's name

Affix Corporate Seal

Attest

Signature of Secretary, Assistant Secretary

Select appropriate title

Print or type Signer's name



This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

> Liberty Mutual Insurance Company The Ohio Casualty Insurance Company West American Insurance Company

Certificate No: 8204866

For bond and/or Power of Attorney (POA) verification inquiries, please call 610-832-8240 or email HOSUR@libertymutual.com.

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that
Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly
organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint,
Flizabeth A Hartzberg

all of the city of state of Tennessee each individually if there be more than one named, its true and lawful attorney-in-fact to Nashville make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 15th day of February, 2021.





Liberty Mutual Insurance Company The Ohio Casualty Insurance Company West American Insurance Company

David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA COUNTY OF MONTGOMERY

On this 15th day of February, 2021, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



Commonwealth of Pennsylvania - Notary Seel Teresa Pastella, Notary Public **Montgomery County** My commission expires March 28, 2025 Commission number 1126044 Member, Pennsylvania Association of Notaries

Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV - OFFICERS: Section 12. Power of Attorney.

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII - Execution of Contracts: Section 5. Surety Bonds and Undertakings.

Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys in fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneysinfact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surely bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, of Liberty Mutual Insurance Company, The Ohio Casualty Insurance Company, and West American Insurance Company do hereby certify that this power of attorney executed by said Companies is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set any hand and affixed the seals of said Companies this 2022 January





Renee C. Llewellyn, Assistant Secretary