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

C204785

CONTRACT AND

CONTRACT BONDS

FOR CONTRACT NO. C204785

WBS 46377.3.1 STATE FUNDED

T.I.P NO. R-5705A

COUNTY OF HARNETT
THIS IS THE ROADWAY & CULVERT CONTRACT
ROUTE NUMBER NC-55 LENGTH 4.364 MILES
LOCATION NC-55 FROM SOUTH OF SR-1532 (OAK GROVE CHURCH RD) TO NC-210.

CONTRACTOR BARNHILL CONTRACTING CO
ADDRESS P.O. BOX 7948
ROCKY MOUNT, NC 27804

BIDS OPENED SEPTEMBER 19, 2023
CONTRACT EXECUTION 10/11/2023

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

PROPOSAL

INCLUDES ADDENDUM No.1 DATED 09-06-2023

DATE AND TIME OF BID OPENING: **Sep 19, 2023 AT 02:00 PM**

CONTRACT ID	C204785
WBS	46377.3.1

FEDERAL-AID NO.	STATE FUNDED
COUNTY	HARNETT
T.I.P NO.	R-5705A
MILES	4.364
ROUTE NO.	NC-55
LOCATION	NC-55 FROM SOUTH OF SR-1532 (OAK GROVE CHURCH RD) TO NC-210.

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

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 & CULVERT PROPOSAL

5% BID BOND OR BID DEPOSIT REQUIRED

PROPOSAL FOR THE CONSTRUCTION OF

CONTRACT No. C204785 IN HARNETT COUNTY, NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION,

RALEIGH, NORTH CAROLINA

The Bidder has carefully examined the location of the proposed work to be known as Contract No. **C204785** 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 be 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. **C204785** in **Harnett 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.

NORTH CAROLINA PROFESSIONAL SEAL 022071 ENGINEER RONALD ELTON DAVENPORT, JR.

State Contract Officer

DocuSigned by:

Ronald Elton Davenport, Jr.

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09/06/2023

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PROJECT SPECIAL PROVISIONS

GENERAL

CONTRACTOR PREQUALIFICATION:
(10-18-22)(Rev. 7-18-23) 102 SP1 G01

Revise the *2018 Standard Specifications* as follows:

Page 1-9, Subarticle 102-2(A)(1) Bidder Prequalification, lines 34-36, delete and replace the first sentence with the following:

Applicant shall submit a completed Department Prequalification Application and *Bidder Experience Questionnaire*, along with any additional supporting information requested by the Department, as noted in the application and experience questionnaire package.

Page 1-10, Subarticle 102-2(A) Bidder Prequalification, lines 30-31, delete and replace the first sentence with the following:

Prospective bidders shall obtain prequalification approval at least two business days prior to any letting in which they intend to submit a bid. It is recommended that the prospective bidder file all required statements and documents with the State Prequalifications Engineer no less than 4 weeks before a given letting.

Page 1-10, Subarticle 102-2(B) Purchase Order Bidder Prequalification, lines 34-39, delete and replace the title and first paragraph with the following:

(B) Purchase Order (PO) Prime Contractor Prequalification

Contractors who have been approved to be placed on the Prequalified Bidders' List as noted above may perform work for the Department as a Purchase Order (PO) Prime Contractor and need not apply further. However, Purchase Order (PO) Prime Contractors will not be placed on the Prequalified Bidders' List unless they submit through the prequalification process described above.

Page 1-9, Subarticle 102-2(B)(1) Purchase Order Bidder Prequalification, lines 40-42, delete and replace the first sentence with the following:

Applicant shall submit a completed Department Prequalification Application along with any additional supporting information requested by the Department, as noted in the application.

Page 1-11, Subarticle 102-2(B) Purchase Order Bidder Prequalification, lines 16-18, delete and replace the first sentence with the following:

Prospective bidders shall obtain prequalification approval at least two business days prior to any letting in which they intend to submit a bid. It is recommended that the applicant file all required statements and documents with the State Prequalifications Engineer no less than 4 weeks before a given bid opening for their bid to be considered.

Page 1-11, Subarticle 102-2(C) Subcontractor Prequalification, lines 22-26, delete and replace the first paragraph with the following:

Contractors who have been approved to be placed on the Prequalified Bidders' List or the Purchase Order (PO) Prime Contractor's List as noted above may perform work for the Department as a subcontractor and need not apply further. However, subcontractors will not be placed on the Prequalified List or the Purchase Order (PO) Prime Contractor's List unless they submit through the prequalification process described above.

Page 1-11, Subarticle 102-2(C)(1) Subcontractor Prequalification, lines 27-28, delete and replace the first sentence with the following:

Applicant shall submit a completed Department Prequalification Application along with any additional supporting information requested by the Department, as noted in the application.

Page 1-11, Subarticle 102-2(C) Subcontractor Prequalification, lines 44-45, delete and replace the first sentence with the following:

The subcontractor shall file all required statements and documents with the State Prequalifications Engineer no less than 4 weeks before beginning work.

Page 1-12, Subarticle 102-2(E) Renewal and Requalification, lines 38-40, delete and replace the first sentence with the following:

It is recommended that the renewing or requalifying firm file all required statements and documents with the State Prequalifications Engineer no less than 4 weeks before a given letting for their bid to be considered.

INTERESTED PARTIES LIST:

(6-21-22)(Rev. 7-19-22) 102 SP1 G02

Revise the *2018 Standard Specifications* as follows:

Page 1-12, Article 102-3 PROPOSALS AND PLAN HOLDER LISTS, lines 45-49, delete and replace with the following:

102-3 PROPOSALS AND INTERESTED PARTIES LIST

On Department projects advertised, the prospective bidder shall sign up on the *Interested Parties List* no later than one business day prior to the Letting day of that project, for which he intends to submit a bid. There is no cost for signing up on the *Interested Parties List* that can be found on the Department's website at connect.ncdot.gov/letting.

Page 1-12, Article 102-3 PROPOSALS AND PLAN HOLDER LISTS, lines 1-3, delete and replace the first sentence of the second paragraph with the following:

The proposal will state the location of the contemplated construction and show a schedule of

contract items with the approximate quantity of each of these items for which bid prices are invited.

Page 1-14, Article 102-8 PREPARATION AND SUBMISSION OF BIDS, lines 30-31, delete and replace the first paragraph with the following:

Prior to submitting a bid on a project, the bidder shall sign up on the *Interested Parties List* in conformance with Article 102-3. The bidder shall submit a unit or lump sum price for every item in the proposal other than items that are authorized alternates to those items for which a bid price has been submitted.

LIABILITY INSURANCE:

(5-16-23) 107 SP1 G05

Revise the *2018 Standard Specifications* as follows:

Page 1-64, Article 107-15 LIABILITY INSURANCE, replace the first sentence with the following:

The Contractor shall at its sole cost and expense obtain and furnish to the Department an original standard Association for Cooperative Operations Research and Development (ACORD) certificate of liability insurance evidencing commercial general liability with a limit for bodily injury and property damage in the amount of $5,000,000 per occurrence and $5,000,000 general aggregate, covering the Contractor from claims or damages for bodily injury, personal injury, or for property damages that may arise from operating under the contract by the employees and agents of the Contractor.

CONTRACT TIME AND LIQUIDATED DAMAGES:

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

The date of availability for this contract is **October 30, 2023, except from the beginning of the project to -L- Sta. 114+50 ± (including associated -Y- Lines) will not be available until January 1, 2024**, 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 **April 12, 2028**.

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 SP1 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 **October 30, 2023, except from the beginning of the project to -L- Sta. 114+50 ± (including associated -Y- Lines) will not be available until January 1, 2024**.

The completion date for this intermediate contract time is **October 15, 2027**.

The liquidated damages for this intermediate contract time are **Six Thousand Dollars ($ 6,000.00)** 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 SP1 G14 A

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 **NC 55 and/or NC 210** during the following time restrictions:

DAY AND TIME RESTRICTIONS

Monday thru Friday, 6:00 A.M. to 8:30 A.M. and 4:00 P.M. to 6:00 P.M.

In addition, the Contractor shall not close or narrow a lane of traffic on **NC 55 and/or NC 210**, 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

1. For **unexpected occurrence** that creates unusually high traffic volumes, as directed by the Engineer.

2. For **New Year's Day**, between the hours of **6:00 A.M.** December 31st and **6:00 P.M.** 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.

5. For **Independence Day**, between the hours of **6:00 A.M.** the day before Independence Day 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.

7. For **Thanksgiving**, between the hours of **6:00 A.M.** Tuesday and **6:00 P.M.** Monday.

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 Day.

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 **Two Hundred Fifty Dollars ($ 250.00)** per fifteen **(15)** minute time period.

INTERMEDIATE CONTRACT TIME NUMBER 3 AND LIQUIDATED DAMAGES:
(2-20-07) (Rev. 6-18-13) 108 SP1 G14 H

The Contractor shall complete the work required of **Phase III, Steps #1A thru #1E** as shown on Sheet **TMP-03** 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 **thirty (30)** consecutive calendar days after and including the date the Contractor begins this work.

The liquidated damages are **Two Hundred Fifty Dollars ($ 250.00)** per calendar day.

PERMANENT VEGETATION ESTABLISHMENT:
(2-16-12) (Rev. 10-15-13) 104 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.

DELAY IN RIGHT OF ENTRY:

(7-1-95) (Rev. 7-15-14) 108 SP1 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	Date
074	Douglas E. Williams, Jr.	11-22-2023

MAJOR CONTRACT ITEMS:

(2-19-02) 104 SP1 G28

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

Line #	Description
7	Borrow Excavation
46	Aggregate Base Course
53	Asphalt Concrete Intermediate Course, Type I19.0C
55	Asphalt Concrete Surface Course, Type S9.5C

SPECIALTY ITEMS:

(7-1-95)(Rev. 7-20-21) 108-6 SP1 G37

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

Line #	Description
84-89	Guardrail
90-93	Fencing
98-105, 135	Signing
121-125	Long-Life Pavement Markings
134	Permanent Pavement Markers
136-161	Utility Construction
162-197	Erosion Control
198-225	Signals/ITS System

FUEL PRICE ADJUSTMENT:

(11-15-05) (Rev. 11-15-22) 109-8 SP1 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 **$ 2.9176** 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
Erosion Control Stone	Gal/Ton	0.55
Rip Rap, Class _____	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
Ultra-thin Bonded Wearing Course	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
> 11" Portland Cement Concrete Pavement	Gal/SY	0.327
Concrete Shoulders Adjacent to > 11" Pavement	Gal/SY	0.327

9" to 11" Portland Cement Concrete Pavement	Gal/SY	0.272
Concrete Shoulders Adjacent to 9" to 11" Pavement	Gal/SY	0.272
< 9" Portland Cement Concrete Pavement	Gal/SY	0.245
Concrete Shoulders Adjacent to < 9" 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:

https://connect.ncdot.gov/letting/LetCentral/Fuel%20Usage%20Factor%20Adjustment%20Form%20-%20%20Starting%20Nov%202022%20Lettings.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.

STEEL PRICE ADJUSTMENT:

(4-19-22)(Rev. 9-19-23) SP1 G47

Description and Purpose

Steel price adjustments will be made to the payments due the Contractor for items as defined herein that are permanently incorporated into the work, when the price of raw steel mill products utilized on the contract have fluctuated. The Department will adjust monthly progress payments up or down as appropriate for cost changes in steel according to this provision.

Eligible Items

The list of eligible bid items for steel price adjustment can be found on the Departments website at the following address:

https://connect.ncdot.gov/letting/LetCentral/Eligible%20Bid%20Items%20for%20Steel%20Price%20Adjustment.xlsx

Nuts, bolts, anchor bolts, rebar chairs, connecting bands and other miscellaneous hardware associated with these items shall not be included in the price adjustment.

Adjustments will only be made for fluctuations in the material cost of the steel used in the above products as specified in the Product Relationship Table below. The producing mill is defined as the source of steel product before any fabrication has occurred (e.g., coil, plate, rebar, hot rolled shapes, etc.). No adjustment will be made for changes in the cost of fabrication, coating, shipping, storage, etc.

No steel price adjustments will be made for any products manufactured from steel having an adjustment date, as defined by the Product Relationship Table below, prior to the letting date.

Bid Submittal Requirements

The successful bidder, within 14 calendar days after the notice of award is received by him, shall provide the completed Form SPA-1 to the Department (State Contract Officer or Division Contract Engineer) along with the payment bonds, performance bonds and contract execution signature sheets in a single submittal. If Form SPA-1 is not included in the same submittal as the payment bonds, performance bonds and contract execution signature sheets, the Contractor will not be eligible for any steel price adjustment for any item in the contract for the life of the contract. Form SPA-1 can be found on the Department's website at the following address:

https://connect.ncdot.gov/letting/LetCentral/Form%20SPA-1.xlsm

The Contractor shall provide Form SPA-1 listing the Contract Line Number, (with corresponding Item Number, Item Description, and Category) for the steel products they wish to have an adjustment calculated. Only the contract items corresponding to the list of eligible item numbers for steel price adjustment may be entered on Form SPA-1. The Contractor may choose to have steel price adjustment applied to any, all, or none of the eligible items. However, the Contractor's selection of items for steel price adjustment or non-selection (non-participation) may not be changed once Form SPA-1 has been received by the Department. Items the Bidder chooses for steel price adjustment must be designated by writing the word "Yes" in the column titled "Option" by each Pay Item chosen for adjustment. Should the bidder elect an eligible steel price item, the entire quantity of the line item will be subject to the price adjustment for the duration of the Contract. The Bidder's designations on Form SPA-1 must be written in ink or typed and signed by the Bidder (Prime Contractor) to be considered complete. Items not properly designated, designated with "No", or left blank on the Bidder's Form SPA-1 will automatically be removed from consideration for adjustment. No steel items will be eligible for steel price adjustment on this Project if the Bidder fails to return Form SPA-1 in accordance with this provision.

Establishing the Base Price

The Department will use a blend of monthly average prices as reported from the Fastmarkets platform to calculate the monthly adjustment indices (BI and MI). This data is typically available on the first day of the month for the preceding month. The indices will be calculated by the Department for the different categories found on the Product Relationship Table below. For item numbers that include multiple types of steel products, the category listed for that item number will be used for adjusting each steel component.

The bidding index for Category 1 Steel items is **$ 44.75** per hundredweight.
The bidding index for Category 2 Steel items is **$ 72.38** per hundredweight.
The bidding index for Category 3 Steel items is **$ 65.32** per hundredweight.
The bidding index for Category 4 Steel items is **$ 45.37** per hundredweight.
The bidding index for Category 5 Steel items is **$ 55.25** per hundredweight.
The bidding index for Category 6 Steel items is **$ 70.37** per hundredweight.
The bidding index for Category 7 Steel items is **$ 45.88** per hundredweight.

The bidding index represents a selling price of steel based on Fastmarkets data for the month of **July 2023**.

MI = Monthly Index. – in Dollars ($) per hundredweight (CWT). Use the adjustment indices from the month the steel was shipped from the producing mill, received on the project, or member cast as defined in the Product Relationship Table.

BI = Bidding Index. - in Dollars ($) per hundredweight (CWT). Use the adjustment indices as listed in the proposal.

Steel Product (Title)	BI, MI*	Adjustment Date for MI	Category
Reinforcing Steel, Bridge Deck, and SIP Forms	Based on one or more Fastmarkets indices	Delivery Date from Producing Mill	1
Structural Steel and Encasement Pipe	Based on one or more Fastmarkets indices	Delivery Date from Producing Mill	2
Steel H-Piles, Soldier Pile Walls	Based on one or more Fastmarkets indices	Delivery Date from Producing Mill	3
Guardrail Items and Pipe Piles	Based on one or more Fastmarkets indices	Material Received Date**	4
Fence Items	Based on one or more Fastmarkets indices	Material Received Date**	5
Overhead Sign Assembly, Signal Poles, High Mount Standards	Based on one or more Fastmarkets indices	Material Received Date**	6
Prestressed Concrete Members	Based on one or more Fastmarkets indices	Cast Date of Member	7

Submit documentation to the Engineer for all items listed in the Contract for which the Contractor is requesting a steel price adjustment.

Submittal Requirements

The items in categories 1,2, and 3, shall be specifically stored, labeled, or tagged, recognizable by color marking, and identifiable by Project for inspection and audit verification immediately upon arrival at the fabricator.

Furnish the following documentation for all steel products to be incorporated into the work and documented on Form SPA-2, found on the Departments website at the following address:

https://connect.ncdot.gov/projects/construction/Construction%20Forms/Form%20SPA-2.xlsx

Submit all documentation to the Engineer prior to incorporation of the steel into the completed work. The Department will withhold progress payments for the affected contract line item if the documentation is not provided and at the discretion of the Engineer the work is allowed to proceed. Progress payments will be made upon receipt of the delinquent documentation.

Step 1 (Form SPA -2)

Utilizing Form SPA-2, submit separate documentation packages for each line item from Form SPA-1 for which the Contractor opted for a steel price adjustment. For line items with multiple components of steel, each component should be listed separately. Label each SPA-2 documentation package with a unique number as described below.

a. Documentation package number: (Insert the contract line-item) - (Insert sequential package number beginning with "1").
   Example: 412 - 1,
   412 - 2,
   424 – 1,
   424 – 2,
   424 – 3, etc.
b. The steel product quantity in pounds
   i. The following sources should be used, in declining order of precedence, to determine the weight of steel/iron, based on the Engineers decision:
      1. Department established weights of steel/iron by contract pay item per pay unit;
      2. Approved Shop Drawings;
      3. Verified Shipping Documents;
      4. Contract Plans;
      5. Standard Drawing Sheets;
      6. Industry Standards (i.e., AISC Manual of Steel Construction, AWWA Standards, etc.); and
      7. Manufacture's data.
   ii. Any item requiring approved shop drawings shall have the weights of steel calculated and shown on the shop drawings or submitted and certified separately by the fabricator.
c. The date the steel product, subject to adjustment, was shipped from the producing mill (Categories 1-3), received on the project (Categories 4-6), or casting date (Category 7).

Step 2 (Monthly Calculator Spreadsheet)

For each month, upon the incorporation of the steel product into the work, provide the Engineer the following:

1) Completed NCDOT Steel Price Adjustment Calculator Spreadsheet, summarizing all the steel submittal packages (Form SPA-2) actually incorporated into the completed work in the given month.
   a. Contract Number
   b. Bidding Index Reference Month
   c. Contract Completion Date or Revised Completion Date
   d. County, Route, and Project TIP information
   e. Item Number
   f. Line-Item Description
   g. Submittal Number from Form SPA-2
   h. Adjustment date
   i. Pounds of Steel

2) An affidavit signed by the Contractor stating the documentation provided in the NCDOT Steel Price Adjustment Calculator Spreadsheet is true and accurate.

Price Adjustment Conditions

Download the Monthly Steel Adjustment Spreadsheet with the most current reference data from the Department's website each month at the following address:

https://connect.ncdot.gov/projects/construction/Construction%20Forms/Form%20SPA-3%20NCDOT%20Steel%20Price%20Adjustment%20Calculator.xlsx

If the monthly Fastmarkets data is not available, the data for the most recent immediately preceding month will be used as the basis for adjustment.

Price Adjustment Calculations

The price adjustment will be determined by comparing the percentage of change in index value listed in the proposal (BI) to the monthly index value (MI). (See included sample examples). Weights and date of shipment must be documented as required herein. The final price adjustment dollar value will be determined by multiplying this percentage increase or decrease in the index by the represented quantity of steel incorporated into the work, and the established bidding index (BI) subject to the limitations herein.

Price increase/decrease will be computed as follows:

$$SPA = ((MI/BI) - 1) * BI * (Q/100)$$

Where;

SPA = Steel price adjustment in dollars

MI = Monthly Shipping Index. – in Dollars ($) per hundredweight (CWT). Use the adjustment indices from the month the steel was shipped from the producing mill, received on the project, or member cast as defined in the Product Relationship Table.

BI = Bidding Index. - in Dollars ($) per hundredweight (CWT). Use the adjustment indices as listed in the proposal.

Q = Quantity of steel, product, pounds actually incorporated into the work as documented by the Contractor, or Design Build Team and verified by the Engineer.

Calculations for price adjustment shall be shown separate from the monthly progress estimate and will not be included in the total cost of work for determination of progress or for extension of Contract time in accordance with Subarticle 108-10(B)(1).

Any apparent attempt to unbalance bids in favor of items subject to price adjustment may result in rejection of the bid proposal.

Adjustments will be paid or charged to the Contractor only. Any Contractor receiving an adjustment under this provision shall distribute the proper proportional part of such adjustments to the subcontractor who performed the applicable work.

Delays to the work caused by steel shortages may be justification for a Contract time extension but will not constitute grounds for claims for standby equipment, extended office overhead, or other costs associated with such delays.

If an increase in the steel material price is anticipated to exceed 50% of the original quoted price, the contractor must notify the Department within 7 days prior to purchasing the material. Upon receipt of such notification, the Department will direct the Contractor to either (1) proceed with the work or (2) suspend the work and explore the use of alternate options.

If the decrease in the steel material exceeds 50% of the original quoted price, the contractor may submit to the Department additional market index information specific to the item in question to dispute the decrease. The Department will review this information and determine if the decrease is warranted.

When the steel product adjustment date, as defined in the Product Relationship Table, is after the approved contract completion date, the steel price adjustments will be based on the lesser value of either the MI for the month of the approved contract completion date or the MI for the actual adjustment date.

If the price adjustment is based on estimated material quantities for that time, and a revision to the total material quantity is made in a subsequent or final estimate, an appropriate adjustment will be made to the price adjustment previously calculated. The adjustment will be based on the same indices used to calculate the price adjustment which is being revised. If the adjustment date of the revised material quantity cannot be determined, the adjustment for the quantity in question, will be based on the indices utilized to calculate the steel price adjustment for the last initial documentation package submission, for the steel product subject to adjustment, that was incorporated into the particular item of work, for which quantities are being finalized. Example: Structural steel for a particular bridge was provided for in three different shipments with each having a different mill shipping date. The quantity of structural steel actually used for the bridge was calculated and a steel price adjustment was made in a progress payment. At the conclusion of the work an error was found in the plans of the final quantity of structural steel used for the bridge. The quantity to be adjusted cannot be directly related to any one of the three mill shipping dates. The steel price adjustment for the quantity in question would be calculated using the indices that were utilized to calculate the steel price adjustment for the quantity of structural steel represented by the last initial structural steel documentation package submission. The package used will be the one with the greatest sequential number.

Extra Work/Force Account:

When steel products, as specified herein, are added to the contract as extra work, in accordance with the provisions of Article 104-7 or 104-3, the Engineer will determine and specify in the supplemental agreement, the need for application of steel price adjustments on a case-by-case basis. No steel price adjustments will be made for any products manufactured from steel having an adjustment date prior to the supplemental agreement execution date. Price adjustments will be made as provided herein, except the Bidding Index will be based on the month in which the supplemental agreement pricing was executed.

For work performed on force account basis, reimbursement of actual material costs, along with the specified overhead and profit markup, will be considered to include full compensation for the current cost of steel and no steel price adjustments will be made.

Examples **Form SPA-2**

Steel Price Adjustment Submission Form

Contract Number C203394 Bid Reference Month January 2019

Submittal Date 8/31/2019

Contract Line Item 237

Line Item Description APPROX….LBS Structural Steel

Sequential Submittal Number 2

Supplier	Description of material	Location information	Quantity in lbs.	Adjustment Date
XYZ mill	Structural Steel	Structure 3, Spans A-C	1,200,000	May 4, 2020
ABC distributing	Various channel & angle shapes	Structure 3 Spans A-C	35,000	July 14, 2020
		Total Pounds of Steel	1,235,000	

Note: Attach the following supporting documentation to this form.

- Bill of Lading to support the shipping dates
- Supporting information for weight documentation (e.g., Pay item reference, Shop drawings, shipping documents, Standards Sheets, industry standards, or manufacturer's data)

By providing this data under my signature, I attest to the accuracy of and validity of the data on this form and certify that no deliberate misrepresentation in any manner has occurred.

Printed Name Signature

Examples **Form SPA-2**

Steel Price Adjustment Submission Form

Contract Number C203394 Bid Reference Month January 2019

Submittal Date August 31, 2019

Contract Line Item 237

Line Item Description SUPPORT, OVRHD SIGN STR -DFEB – STA 36+00

Sequential Submittal Number 2

Supplier	Description of material	Location information	Quantity in lbs.	Adjustment Date
XYZ mill	Tubular Steel (Vertical legs)	-DFEB – STA 36+00	12000	December 11, 2021
PDQ Mill	4" Tubular steel (Horizontal legs)	-DFEB – STA 36+00	5900	December 11, 2021
ABC distributing	Various channel & angle shapes (see quote)	-DFEB – STA 36+00	1300	December 11, 2021
	Catwalk assembly	-DFEB – STA 36+00	2000	December 11, 2021
Nucor	Flat plate	-DFEB – STA 36+00	650	December 11, 2021
		Total Pounds of Steel	21,850	

Note: Attach the following supporting documentation to this form.

- Bill of Lading to support the shipping dates
- Supporting information for weight documentation (e.g., Pay item reference, Shop drawings, shipping documents, Standards Sheets, industry standards, or manufacturer's data)

By providing this data under my signature, I attest to the accuracy of and validity of the data on this form and certify that no deliberate misrepresentation in any manner has occurred.

Printed Name Signature

Price Adjustment Sample Calculation (increase)

Project bid on September 17, 2019

Line Item 635 "Structural Steel" has a plan quantity of 2,717,000 lbs.

Bidding Index for Structural Steel (Category 2) in the proposal was $36.12/CWT = BI

450,000 lbs. of Structural Steel for Structure 2 at Station 44+08.60 were shipped to fabricator from the producing mill in same month, May 2021.

Monthly Index for Structural Steel (Category 2) for May 2021 was $64.89/CWT = MI

The Steel Price Adjustment formula is as follows:

SPA = ((MI/ BI) -1) * BI *(Q/100)

Where; SPA = Steel price adjustment in dollars

BI = Bidding Index – in dollars ($) per hundredweight (CWT). Use the adjustment indices as listed in the proposal.

MI = Mill Shipping Index – in dollars ($) per hundredweight (CWT). Use the adjustment indices from the month the steel was shipped from the producing mill, received on the project, or member cast as defined in the Product Relationship Table.

Q = Quantity of steel product, in pounds (lbs.) actually incorporated into the work as documented by the Contractor, or Design Build Team and verified by the Engineer.

BI = $36.12/ CWT

MI = $64.89 / CWT

% change = ((MI/ BI)-1) = ($64.89 / $36.12 – 1) = (1.79651 – 1) = 0.79651162791

Q = 450,000 lbs.

SPA = 0.79651162791x $36.12 x (450,000/100)

SPA = 0.79651162791* $36.12 *4,500

SPA = $129,465 pay adjustment to Contractor for Structural Steel (Structure 2 at Station 44+08.60)

Price Adjustment Sample Calculation (decrease)

Project bid on December 18, 2018

Line Item 635 Structural Steel has a plan quantity of 2,717,000 lbs.

Bidding Index for Structural Steel (Category 2) in the proposal was $46.72/CWT = BI

600,000 lbs. of Structural Steel for Structure 1 at Station 22+57.68 were shipped to fabricator from the producing mill in same month, August 2020.

Monthly Index for Structural Steel (Category 2) for August 2020 was $27.03/CWT = MI

The Steel Price Adjustment formula is as follows:

SPA = ((MI/ BI) -1) * BI *(Q/100)

Where; SPA = Steel price adjustment in dollars

BI = Bidding Index – in dollars ($) per hundredweight (CWT). Use the adjustment indices as listed in the proposal.

MI = Mill Shipping Index – in dollars ($) per hundredweight (CWT). Use the adjustment indices from the month the steel was shipped from the producing mill, received on the project, or member cast as defined in the Product Relationship Table.

Q = Quantity of steel product, in pounds (lbs.) actually incorporated into the work as documented by the Contractor, or Design Build Team and verified by the Engineer.

BI = $46.72/ CWT

MI = $27.03 / CWT

% change = ((MI/ BI)-1) = ($27.03/ $46.72–1) = (0.57855–1) = -0.421446917808

Q = 600,000 lbs.

SPA = -0.421446917808 * $46.72 * (600,000/100)

SPA = -0.421446917808 * $46.72 *6,000

SPA = $ 118,140.00 Credit to the Department for Structural Steel (Structure 1 at Station 22+57.68)

Price Adjustment Sample Calculation (increase)

Project bid on July 16, 2020

Line Item 614 Reinforced Concrete Deck Slab has a plan quantity of 241974 lbs.

Bidding Index Reference Month was May 2020. Bidding Index for Reinforced Concrete Deck Slab (Category 1) in the proposal was $29.21/CWT = BI

51,621 lbs. of reinforcing steel and 52,311 lbs. of epoxy coated reinforcing steel for Structure 2 at Station 107+45.55 -L- was shipped to fabricator from the producing mill in same month, May 2021.

Monthly Index for Reinforced Concrete Deck Slab (Category 1) for May 2021 was $43.13/CWT = MI

The Steel Price Adjustment formula is as follows:

SPA = ((MI/ BI) -1) * BI *(Q/100)

Where; SPA = Steel price adjustment in dollars

BI = Bidding Index – in dollars ($) per hundredweight (CWT). Use the adjustment indices as listed in the proposal.

MI = Mill Shipping Index – in dollars ($) per hundredweight (CWT). Use the adjustment indices from the month the steel was shipped from the producing mill, received on the project, or member cast as defined in the Product Relationship Table.

Q = Quantity of steel product, in pounds (lbs.) actually incorporated into the work as documented by the Contractor, or Design Build Team and verified by the Engineer.

BI = $29.21/ CWT

MI = $43.13 / CWT

% change = ((MI/ BI)-1) = ($43.13 / $29.21 – 1) = (1.47655 – 1) = 0.47654912701

Q = 103932 lbs.

SPA = 0. 47654912701 * $29.21 * (103,932/100)

SPA = 0. 47654912701 * $29.21 *1,039.32

SPA = $14,467.33 Pay Adjustment to Contractor for Reinforced Concrete Deck Slab (Category 1) at Station 107+45.55 -L-

PAYOUT SCHEDULE:

(1-19-10) (Rev. 1-17-12) 108 SP1 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:

(7-15-08) (Rev. 6-20-23) 108-2 SP1 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:

	Fiscal Year	**Progress (% of Dollar Value)**
2024	(7/01/23 - 6/30/24)	**22**% of Total Amount Bid
2025	(7/01/24 - 6/30/25)	**29**% of Total Amount Bid
2026	(7/01/25 - 6/30/26)	**27**% of Total Amount Bid
2027	(7/01/26 - 6/30/27)	**19**% of Total Amount Bid
2028	(7/01/27 - 6/30/28)	**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%20Forms/Joint%20Check%20Notification%20Form.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%20a%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 **6.0 %**

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

(A) Minority Business Enterprises **3.0 %**

(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 **3.0 %**

(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/WBEs 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.

(2) 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

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)(Rev. 8-16-22) 450 SP1 G112 A

Subsurface information is available on the roadway portion of this project.

PORTABLE CONCRETE BARRIER - (Partial Payments for Materials):

(7-1-95) (Rev. 8-16-11) 1170-4 SP1 G121

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.

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 SP1 G133

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

R-5705B (C204745) is located adjacent to this project. R-5705B is currently under construction and is not anticipated to be complete prior to the letting of this project.

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"

AWARD LIMITS:
(4-19-22) 103 SP1 G141

Revise the *2018 Standard Specifications* as follows:

Page 1-29, Subarticle 103-4(C), Award Limits, line 4-8, delete and replace the first sentence in the first paragraph with the following:

A bidder who desires to bid on more than one project on which bids are to be opened in the same letting and who 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 form Award Limits on Multiple Projects for each project subject to the award limit.

BID DOCUMENTATION:
(1-1-02) (Rev.8-18-15) 103 SP1 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 C*ease 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.

PROJECT SPECIAL PROVISIONS

ROADWAY

CLEARING AND GRUBBING - METHOD III:

(4-6-06) (Rev.8-18-15) 200 SP2 R02B

Perform clearing on this project to the limits established by Method "III" shown on Standard Drawing No. 200.03 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*.

COAL COMBUSTION PRODUCTS IN EMBANKMENTS:

(4-16-02) (Rev. 12-15-20) 235 SP02 R70

Description

This specification allows the Contractor an option, with the approval of the Engineer, to use coal combustion products (CCPs) in embankments as a substitute for conventional borrow material. The amount of CCPs allowed to be used for this project will be less than 80,000 tons total and less than 8,000 tons per acre.

Materials

Supply coal combustion products from the Department list of potential suppliers maintained by the Materials and Tests Unit. Site specific approval of CCP material will be required prior to beginning construction.

The following CCPs are unacceptable:

(A) Frozen material,

(B) Ash from boilers fired with both coal and petroleum coke, and

(C) Material with a maximum dry unit weight of less than 65 pounds per cubic foot when tested in accordance with AASHTO T-99 Method A or C.

Collect and transport CCPs in a manner that will prevent nuisances and hazards to public health and safety. Moisture condition the CCPs as needed and transport in covered trucks to prevent dusting.

Preconstruction Requirements

When CCPs are to be used as a substitute for earth borrow material, request written approval from the Engineer at least ninety (90) days in advance of the intent to use CCPs and include the following details using the NCDOT Form CCP-2015 in accordance with NCGS § 130A-309.219(b)(1):

(A) Description, purpose and location of project.
(B) Estimated start and completion dates of project.
(C) Estimated volume of CCPs to be used on project with specific locations and construction details of the placement.
(D) Toxicity Characteristic Leaching Procedure analysis from a representative sample of each different CCP source to be used in the project for, at minimum, all of the following constituents: arsenic, barium, cadmium, lead, chromium, mercury, selenium, and silver.
(E) The names, address, and contact information for the generator of the CCPs.
(F) Physical location of the project at which the CCPs were generated.

Submit the form to the Engineer and the Resource Conservation Program (RCP) Engineer at ResourceConservation@ncdot.gov for review. The Engineer and the RCP Engineer will coordinate the requirements of NCGS § 130A-309.219(a)(1) and notify the Contractor that all the necessary requirements have been met before the placement of structural fill using coal combustion products is allowed.

Construction Methods

In accordance with the detail in the plans, place CCPs in the core of the embankment section with at least 4 feet of earth cover to the outside limits of the embankments or subgrade and at least 5 feet above the seasonal high ground-water table. CCPs used in embankments shall not be placed as follows:

(A) Within 50 feet of any property boundary.
(B) Within 300 horizontal feet of a private dwelling or well.
(C) Within 50 horizontal feet of the top of the bank of a perennial stream or other surface water body.
(D) Within a 100-year floodplain except as authorized under NCGS § 143-215.54A(b). A site located in a floodplain shall not restrict the flow of the 100-year floodplain or result in washout of solid waste so as to pose a hazard to human life, wildlife or land and water resources.
(E) Within 50 horizontal feet of a wetland, unless, after consideration of the chemical and physical impact on the wetland, the United States Army Corps of Engineers issues a permit or waiver for the fill.

Construct embankments by placing CCPs in level uniform lifts with no more than a lift of 10 inches and compacted to at least a density of 95 percent as determined by test methods in AASHTO T-

99, Determination of Maximum Dry Density and Optimum Moisture Content, Method A or C depending upon particle size of the product. Provide a moisture content at the time of compaction of within 4 percent of optimum but not greater than one percent above optimum as determined by AASHTO T-99, Method A or C.

Divert surface waters resulting from precipitation from the CCPs placement area during filling and construction activities. Construct embankments such that rainfall will not run directly off of the CCPs. Provide dust control to minimize airborne emissions. Construct fill in a manner that prevents water from accumulating and ponding and do not pump nor discharge waters from CCP's filling and construction areas.

Measurement and Payment

Borrow Excavation will be measured by truck volume and paid in cubic yards in accordance with Article 230-5 of the *2018 Standard Specifications*.

MANUFACTURED QUARRY FINES IN EMBANKMENTS:

(01-17-17)(Rev. 7-18-23) 235 SP02 R72

Description

This specification addresses the use of manufactured quarry fines that are not classified as select materials. The specification allows the Contractor an option, with the approval of the Engineer, to use manufactured quarry fines (MQFs) in embankments as a substitute for conventional borrow material. Furnish and place geotextile for subgrade stabilization in accordance with the contract. Geotextile for subgrade stabilization is required to prevent pavement cracking and provide separation between the subgrade and pavement section at embankment locations where manufactured quarry fines are utilized and as directed by the Engineer.

Materials

Manufactured Quarry Fines.

Site specific approval of MQFs material will be required prior to beginning construction as detailed in the preconstruction requirements of this provision.

The following MQFs are unacceptable:

(A) Frozen material,

(B) Material with a maximum dry unit weight of less than 90 pounds per cubic foot when tested in accordance with AASHTO T-99 Method A or C.

(C) Material with greater than 80% by weight Passing the #200 sieve

Collect and transport MQFs in a manner that will prevent nuisances and hazards to public health and safety. Moisture condition the MQFs as needed and transport in covered trucks to prevent dusting. If MQFs are blended with natural earth material, follow Borrow Criteria in Section 1018 of the *Standard Specifications*.

Geotextiles

Areas of embankment where MQFs are incorporated, Geotextile for Subgrade Stabilization shall be used. If the Geotextile for Subgrade Stabilization special provision is not included elsewhere in this contract, then it along with a detail will be incorporated as part of the contractors request to use.

Preconstruction Requirements

When MQFs are to be used as a substitute for earth borrow material, request written approval from the Engineer at least ninety (90) days in advance of the intent to use MQFs and include the following details:

(A) Description, purpose and location of project.
(B) Estimated start and completion dates of project.
(C) Estimated volume of MQFs to be used on project with specific locations and construction details of the placement.
(D) The names, address, and contact information for the generator of the MQFs.
(E) Physical location of the site at which the MQFs were generated.

The Engineer will forward this information to the State Materials Engineer for review and material approval.

Construction Methods

Place MQFs in the core of the embankment section with at least 4 feet of earth cover to the outside limits of the embankments or subgrade.

Construct embankments by placing MQFs in level uniform lifts with no more than a lift of 10 inches and compacted to at least a density of 95 percent as determined by test methods in AASHTO T-99, Determination of Maximum Dry Density and Optimum Moisture Content, Method A or C depending upon particle size of the product. Provide a moisture content at the time of compaction of within 4 percent of optimum but not greater than one percent above optimum as determined by AASHTO T-99, Method A or C.

Areas of embankment where MQFs are incorporated, Geotextile for Subgrade Stabilization shall be used. See the contract for geotextile type and construction method for Geotextile for Subgrade Stabilization.

Measurement and Payment

Borrow Excavation will be measured by truck volume and paid in cubic yards in accordance with Article 230-5 of the *2018 Standard Specifications*. As an alternate weigh tickets can be provided and payment made by converting weight to cubic yards based on the verifiable unit weight.

When the pay item for *Geotextile for Subgrade Stabilization* is included in the original contract the material will be measured and paid in accordance with the contract. When the pay item for *Geotextile for Subgrade Stabilization* is not included in the original contract then no payment will be made for this item and will be considered incidental to the use of MQFs in embankment.

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*.

Item	Section
Flowable Fill	1000-6

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 Item	Pay Unit
Flowable Fill	Cubic 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.

CULVERT PIPE:
(8-20-19)(Rev. 5-17-22) 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, galvanized 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:

Item	Section
Polypropylene Pipe	1032-9
Galvanized Corrugated Steel Pipe	1032-3

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

Item	Section
Polypropylene Pipe	1032-9
Galvanized Corrugated Steel Pipe	1032-3

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, galvanized 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.

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.

STABILIZATION OF COASTAL PLAIN SANDS:

(11-18-14) 510 SP5 R12

Description

As directed by the Engineer, stabilize sandy subgrade material with Class IV aggregate to prevent rutting of the subgrade prior to paving directly on the subgrade. Remove material as needed in cut areas prior to placing the Class IV aggregate.

Materials

Refer to Division 10.

Item	Section
Select Material, Class IV	1016

Use Class IV Select Material for Class IV Aggregate Stabilization.

Construction Methods

Class IV Aggregate Stabilization

As directed by the Engineer, place aggregate by end dumping aggregate on approved subgrade soils to provide a working platform and reduce wheel rutting of subgrade material. Place the Class IV aggregate stabilization to a thickness of 2 to 3 inches.

Maintenance

Maintain aggregate stabilization in an acceptable condition and minimize the use of heavy equipment on aggregate in order to avoid damaging the subgrade. Provide and maintain drainage ditches and drains as required to prevent entrapping water in aggregate stabilization.

Measurement and Payment

Class IV Aggregate Stabilization will be measured and paid in tons. Aggregate will be measured by weighing in trucks in accordance with Article 106-7. The contract unit price for *Class IV Aggregate Stabilization* will be full compensation for furnishing, hauling, handling, placing, mixing, compacting and maintaining aggregate.

The work to excavate material to place Class IV Aggregate Stabilization below subgrade is considered incidental to the work of placing the aggregate and no separate payment will be made.

Payment will be made under:

Pay Item	Pay Unit
Class IV Aggregate Stabilization	Ton

INCIDENTAL MILLING:

Revise the *2018 Standard Specifications* as follows:

Page 6-5, Article 607-3 CONSTRUCTION METHODS, add the following paragraph after line 45:

Variable depth milling is intended to improve the cross-sectional slope of the pavement.

Page 6-6, Article 607-3 CONSTRUCTION METHODS, line 9, delete and replace the first sentence in the sixth paragraph with the following:

The Engineer may require re-milling of any area exhibiting pavement laminations, scabbing or other defects.

Page 6-6, Article 607-4 TOLERANCE, lines 17-18, delete and replace the second sentence with the following:

The Engineer may vary the depth of milling by not more than one inch. In the event the directed depth of milling cut is altered by the Engineer more than one inch, either the Department or the Contractor may request an adjustment in unit price in accordance with Article 104-3. In administering Article 104-3, the Department will give no consideration to value given to RAP due to the deletion or reduction in quantity of milling. Article 104-3 will not apply to the item of *Incidental Milling*.

Page 6-6, Subarticle 607-5(A) Milled Asphalt Pavement, lines 21-23, delete and replace the first sentence with the following:

Milled Asphalt Pavement, __" Depth will be measured and paid as the actual number of square yards of pavement surface milled in accordance with this specification.

Page 6-6, Subarticle 607-5(A) Milled Asphalt Pavement, lines 24-28, delete and replace the third and fourth sentence with the following:

The width will be the width required by the plans or directed by the Engineer, measured along the pavement surface. Areas to be paid under this item include mainline travel lanes, full width turn lanes greater than 500 feet in length, collector lanes, shoulders, and any additional equipment necessary to remove pavement in the area of manholes, water valves, curb, gutter and other obstructions.

Page 6-6, Subarticle 607-5(B) Milled Asphalt Pavement Depth Varies from Required Depth, lines 29-37, delete and replace the title and first paragraph with the following:

(B) Variable Depth Milled Asphalt Pavement

Milling Asphalt Pavement, __" to __" will be measured and paid as the actual number of square yards of pavement surface milled in accordance with this specification. In measuring this quantity,

the length will be the actual length milled, measured along the pavement surface. The width will be the width required by the plans or directed by the Engineer, measured along the pavement surface. Areas to be paid under this item include mainline travel lanes, full width turn lanes greater than 500 feet in length, collector lanes, shoulders, and any additional equipment necessary to remove pavement in the area of manholes, water valves, curb, gutter and other obstructions.

Page 6-6, Subarticle 607-5(C) Incidental Milling, lines 45-49, delete and replace the first and second sentence with the following:

Incidental Milling will be measured and paid as the actual number of square yards of surface milled where the Contractor is required to mill butt joints, irregular areas, full width turn lanes 500 feet or less, intersections and re-mill areas that are not due to the Contractor's negligence. In measuring this quantity, the length will be the actual length milled, measured along the pavement surface. The width will be the width required by the plans or directed by the Engineer, measured along the pavement surface.

Page 6-7, Subarticle 607-5(D) Milling of Defects, lines 6-10, delete and replace the second sentence with the following:

If the Engineer directs re-milling of an area and is not due to the Contractor's negligence, the re-milled area will be measured as provided in Subarticle 607-5(C) and paid at the contract unit price per square yard for *Incidental Milling*.

PRICE ADJUSTMENT - ASPHALT BINDER FOR PLANT MIX:
(11-21-00) 620 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 **$ 618.13** per ton.

This base price index represents an average of F.O.B. selling prices of asphalt binder at supplier's terminals on **August 1, 2023**.

MILLING ASPHALT PAVEMENT:
(1-15-19) 607 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. 7-18-23) 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)	± 10.0%
19.0 mm sieve (Base Mix)	± 10.0%
12.5 mm sieve (Intermediate & Type P-57)	± 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)	± 2.0%
Asphalt Binder Content	± 0.5%
Maximum Specific Gravity (G_{mm})	± 0.020
Bulk Specific Gravity (G_{mb})	± 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 MIX DESIGN CRITERIA								
Mix Type	**Design ESALs millions [A]**	**Binder PG Grade**	**Compaction Levels**	**Max. Rut**	**Volumetric Properties [B]**			
			G_{mm} @		**VMA**	**VTM**	**VFA**	

			N_{ini}	N_{des}	Depth (mm)	% Min.	%	Min.-Max.	$\%G_{mm}$ @ N_{ini}
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 Types	Dust to Binder Ratio ($P_{0.075}$ / P_{be})					0.6 - 1.4 [C]			
	Tensile Strength Ratio (TSR) [D]					85% Min. [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:

Mix Type	%RBR ≤ 20%	21% ≤ %RBR ≤ 30%	%RBR > 30%
S4.75A, S9.5B, S9.5C, I19.0C, B25.0C	PG 64-22	PG 64-22[A]	PG-58-28
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	**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 Interstates, US Routes, and NC Routes (primary routes) that have 4 or more lanes and are 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, and Y-lines that have 4 or more lanes and are median divided, and all 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 shall 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.
B. 95 / 90 denotes that 95% of the coarse aggregate has one fractured face and 90% has 2 or more fractured faces.

Page 10-30, Subarticle 1012-1(B)(6), Toughness (Resistance to Abrasion), line 12, replace "OGAFC" with "OGFC".

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

GUARDRAIL END UNITS & TEMPORARY GUARDRAIL END UNITS, TYPE - TL-3:
(4-20-04) (Rev. 5-16-23) 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 *Standard Specifications*, and at locations shown in the plans.

Materials

Furnish guardrail end units listed on the NCDOT APL. Units shall not be modified by the manufacturer and installer once approved and on the NCDOT APL.

Prior to installation the Contractor shall submit to the Engineer certified working drawings and assembling instructions from the manufacturer for each guardrail end unit in accordance with Article 105-2 of the *Standard Specifications*.

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 *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 *Standard Specifications*.

Payment will be made under:

Pay Item	Pay Unit
Guardrail End Units, Type TL-3	Each
Temporary Guardrail End Units, Type TL-3	Each

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 ± 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.

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 Concrete	Min. Compressive Strength at 28 days	Maximum Water-Cement Ratio				Consistency Maximum Slump		Cement Content			
		Air-Entrained Concrete		Non-Air-Entrained Concrete		Vibrated	Non-Vibrated	Vibrated		Non-Vibrated	
		Rounded Aggregate	Angular Aggregate	Rounded Aggregate	Angular 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	---
B	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	as needed	as needed	as needed	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 INTERMIXED BEAD TESTING:

7-19-22 1087 SP10 R04

Revise the *2018 Standard Specifications* as follows:

Page 10-183, Subarticle 1087-7(B) Thermoplastic Pavement Marking Material Composition, delete line 34 and 35.

Page 10-184, Article 1087-8 MATERIAL CERTIFICATION, delete and replace with the following after line 34:

Drop-on Glass Beads	Type 3 Material Certification and Type 4 Material Certification
Intermix Glass Beads	Type 2 Material Certification and Type 3 Material Certification
Paint	Type 3 Material Certification
Removable Tape	Type 3 Material Certification
Thermoplastic	Type 3 Material Certification and Type 4 Material Certification
Cold Applied Plastic	Type 2 Material Certification and Type 3 Material Certification
Polyurea	Type 2 Material Certification and Type 3 Material Certification

THERMOPLASTIC PAVEMENT MARKING MATERIAL – COLOR TESTING:

3-19-19 1087 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 $\geq$ 45%, and x,y shall fall within PR#1 chart chromaticity limits.

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 Item	**Pay Unit**
Non-Cast Iron Snowplowable Pavement Marker	Each
Replace Snowplowable Pavement Marker Reflector	Each

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
pH	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.

GEOSYNTHETICS:

(03-21-23)(Rev. 4-18-23) 1056 SP10 R56

Revise the *Standard Specifications* as follows:

Page 10-77, Article 1056-1 DESCRIPTION, lines 13-16, delete and replace the second sentence in the second paragraph with the following:

Steel anchor pins shall have a diameter of at least 3/16 inch, a length of at least 18 inches, a point at one end and a head at the other end that will retain a steel washer with an outside diameter of at least 1.5 inches.

Page 10-77, Article 1056-2 HANDLING AND STORING, lines 20-21, delete and replace the third sentence in the first paragraph with the following:

Geosynthetics with defects, flaws, deterioration or damage will be rejected by the Engineer.

Page 10-77, Article 1056-3 CERTIFICATIONS AND IDENTIFICATION, lines 25-27, delete and replace the first sentence in the first paragraph with the following:

Provide Type 1, Type 2 or Type 4 material certifications in accordance with Article 106-3 for geosynthetics except certifications are not required for Type 1 through Type 5 geotextiles.

Page 10-77, Article 1056-3 CERTIFICATIONS AND IDENTIFICATION, lines 32-35, delete the second paragraph.

Page 10-77, Article 1056-3 CERTIFICATIONS AND IDENTIFICATION, lines 36-41, delete and replace the third paragraph with the following:

Allow the Engineer to visually identify geosynthetic products before installation. Open packaged geosynthetics just before use in the presence of the Engineer to verify the correct product. Geosynthetics that are missing original packaging or product labels or that have been unwrapped or previously opened will be rejected unless otherwise approved by the Engineer.

Page 10-77, Article 1056-4 GEOTEXTILES, lines 43-45, delete the first paragraph.

Page 10-78, Article 1056-4 GEOTEXTILES, before line 1 and lines 1-5, delete Table 1056-1 and lines 1-5 and replace with the following:

TABLE 1056-1 GEOTEXTILE REQUIREMENTS						
Property[A]	**Requirement (MARV[A])**					**Test Method**
	Type 1	**Type 2**	**Type 3[B]**	**Type 4**	**Type 5[C]**	
Typical Application	*Shoulder Drains*	*Under Rip Rap*	*Silt Fence Fabric*	*Soil Stabilization*	*Subgrade Stabilization*	
Elongation (MD & CD)	≥ 50%	≥ 50%	≤ 25%	< 50%	< 50%	ASTM D4632
Grab Strength (MD & CD)[A]	Table 1[D], Class 3	Table 1[D], Class 1	100 lb	Table 1[D], Class 3	–	ASTM D4632
Tear Strength (MD & CD)[A]			–			ASTM D4533
Puncture Strength			–			ASTM D6241
Ultimate Tensile Strength (MD & CD)[A]	–	–	–	–	Table 12[D], Class 4A	ASTM D4595
Permittivity	Table 2[D], 15% to 50% *in Situ* Soil Passing 0.075 mm	Table 6[D], 15% to 50% *in Situ* Soil Passing 0.075 mm	Table 7[D]	Table 5[D]	Table 12[D], Class 4A	ASTM D4491
Apparent Opening Size						ASTM D4751
UV Stability (Retained Strength)						ASTM D4355

A. MD, CD and MARV per Article 1056-3.
B. Minimum roll width of 36 inches required.
C. Minimum roll width of 13 feet required unless otherwise approved by the Engineer for the application.
D. Per AASHTO M 288.

Page 10-78, Article 1056-5 GEOCOMPOSITE DRAINS, before line 9 and lines 9-10, delete Table 1056-2 and lines 9-10 and replace with the following:

TABLE 1056-2 GEOCOMPOSITE DRAIN REQUIREMENTS				
Property	**Requirement**			**Test Method**
	Sheet Drain	**Strip Drain**	**Wick Drain**	
Width	≥ 12"	12" ±1/4"	4" ±1/4"	N/A
In-Plane Flow Rate[A] (with gradient of 1.0 and 24-hour seating period)	6 gpm/ft @ applied normal compressive stress of 10 psi	15 gpm/ft @ applied normal compressive stress of 7.26 psi	1.5 gpm[B] @ applied normal compressive stress of 1.45 psi	ASTM D4716

A. MARV per Article 1056-3.
B. Per foot of width tested.

Page 10-79, Article 1056-5 GEOCOMPOSITE DRAINS, before line 3, delete Table 1056-3 and replace with the following:

TABLE 1056-3 DRAINAGE CORE REQUIREMENTS			
Property	**Requirement**		**Test Method**
	Sheet Drain	**Strip Drain**	
Thickness	1/4"	1"	ASTM D1777 or D5199
Compressive Strength[A]	40 psi	30 psi	ASTM D6364

A. MARV per Article 1056-3.

Page 10-79, Article 1056-5 GEOCOMPOSITE DRAINS, before line 6 and lines 6-11, delete Table 1056-4, lines 6-7 and the last paragraph and replace with the following:

TABLE 1056-4 WICK DRAIN GEOTEXTILE REQUIREMENTS		
Property	**Requirement**	**Test Method**
Elongation	≥ 50%	ASTM D4632
Grab Strength	Table 1[A], Class 3	ASTM D4632
Tear Strength		ASTM D4533
Puncture Strength		ASTM D6241
Permittivity[B]	0.7 sec^{-1}	ASTM D4491
Apparent Opening Size (AOS)	Table 2[A], > 50% *in Situ* Soil Passing 0.075 mm	ASTM D4751
UV Stability (Retained Strength)		ASTM D4355

A. Per AASHTO M 288.
B. MARV per Article 1056-3.

For wick drains with a geotextile fused to both faces of a corrugated drainage core along the peaks of the corrugations, use wick drains with an ultimate tensile strength of at least 1,650 lbs. per 4 inch width in accordance with ASTM D4595 and geotextiles with a permittivity, AOS and UV stability that meet Table 1056-4.

Page 10-80, Article 1056-6 GEOCELLS, before line 1 and lines 1-4, delete Table 1056-5 and lines 1-4 and replace with the following:

TABLE 1056-5 GEOCELL REQUIREMENTS		
Property	**Requirement**	**Test Method**
Cell Depth	4"	N/A
Fully Expanded Cell Area	100 sq.in. max	N/A
Sheet Thickness	50 mil -5%, +10%	ASTM D5199
Density	58.4 pcf min	ASTM D1505
Carbon Black Content	1.5% min	ASTM D1603 or D4218
ESCR[A]	5000 hr min	ASTM D1693
Coefficient of Direct Sliding (with material that meets AASHTO M 145 for soil classification A-2)	0.85 min	ASTM D5321
Short-Term Seam (Peel) Strength (for 4" seam)	320 lb min	USACE[C] Technical Report GL-86-19, Appendix A
Long-Term Seam (Hang) Strength[B] (for 4" seam)	160 lb min	

A. Environmental Stress Crack Resistance.

B. Minimum test period of 168 hours with a temperature change from 74°F to 130°F in 1-hour cycles.

C. US Army Corps of Engineers (USACE).

TEMPORARY SHORING:

(2-20-07) (Rev. 10-19-21) SP11 R02

Description

Temporary shoring includes cantilever, braced and anchored shoring and temporary mechanically stabilized earth (MSE) walls. Temporary shoring does not include trench boxes. At the Contractor's option, use any type of temporary shoring unless noted otherwise in the plans or as directed. Design and construct temporary shoring based on actual elevations and shoring dimensions in accordance with the contract and accepted submittals. Construct temporary shoring at locations shown in the plans and as directed. Temporary shoring is required to maintain traffic when a 2:1 (H:V) slope from the top of an embankment or bottom of an excavation will intersect the existing ground line less than 5 feet from the edge of pavement of an open travelway. This provision does not apply to pipe, inlet or utility installation unless noted otherwise in the plans.

Positive protection includes concrete barrier and temporary guardrail. Provide positive protection for temporary shoring at locations shown in the plans and as directed. Positive protection is required if temporary shoring is located in the clear zone in accordance with the *AASHTO Roadside Design Guide.*

(A) Cantilever and Braced Shoring

Cantilever shoring consists of steel sheet piles or H-piles with timber lagging. Braced shoring consists of sheet piles or H-piles with timber lagging and bracing such as beams, plates, walers, struts, rakers, etc. Define "piles" as sheet piles or H-piles.

(B) Anchored Shoring

Anchored shoring consists of sheet piles with walers or H-piles with timber lagging anchored with ground or helical anchors. Driven anchors may be accepted at the discretion of the Engineer. A ground anchor consists of a grouted steel bar or multi-strand tendon with an anchorage. A helical anchor consists of a lead section with a central steel shaft and at least one helix steel plate followed by extensions with only central shafts (no helixes) and an anchorage. Anchorages consist of steel bearing plates with washers and hex nuts for bars or steel wedge plates and wedges for strands. Use a prequalified Anchored Wall Contractor to install ground anchors. Define "anchors" as ground, helical or driven anchors.

(C) Temporary MSE Walls

Temporary MSE walls include temporary geosynthetic and wire walls. Define "temporary wall" as a temporary MSE wall and "Temporary Wall Vendor" as the vendor supplying the temporary MSE wall. Define "reinforcement" as geotextile, geogrid, geostrip, welded wire grid or metallic strip reinforcement.

Temporary geosynthetic walls consist of geotextiles or geogrids wrapped behind welded wire facing or geostrips connected to welded wire facing. Define "temporary geotextile wall" as a temporary geosynthetic wall with geotextile reinforcement, "temporary geogrid wall" as a temporary geosynthetic wall with geogrid reinforcement and "temporary geostrip wall" as a temporary geosynthetic wall with geostrip reinforcement.

Temporary wire walls consist of welded wire grid or metallic strip reinforcement connected to welded wire facing. Define "Wire Wall Vendor" as the vendor supplying the temporary wire wall.

(D) Embedment

Define "embedment" for cantilever, braced and anchored shoring as the pile depth below the grade in front of shoring. Define "embedment" for temporary walls as the wall embedment below the grade at the wall face.

(E) Positive Protection

Define "unanchored or anchored portable concrete barrier" as portable concrete barrier (PCB) that meets 2018 Roadway Standard Drawing No. 1170.01. Define "concrete barrier" as unanchored or anchored PCB or an approved equal. Define "temporary guardrail" as temporary steel beam guardrail that meets 2018 Roadway Standard Drawing No. 862.02.

Materials

Refer to the *2018 Standard Specifications*.

Item	**Section**
Concrete Barrier Materials	1170-2

Item	Section
Flowable Fill, Excavatable	1000-6
Geosynthetics	1056
Grout, Type 1	1003
Portland Cement	1024-1
Portland Cement Concrete	1000
Select Materials	1016
Steel Beam Guardrail Materials	862-2
Steel Plates	1072-2
Steel Sheet Piles and H-Piles	1084
Untreated Timber	1082-2
Water	1024-4
Welded Wire Reinforcement	1070-3

Provide Type 6 material certifications for shoring materials in accordance with Article 106-3 of the *2018 Standard Specifications*. Use Class IV select material for temporary guardrail and Class A concrete that meets Article 450-2 of the *2018 Standard Specifications* or Type 1 grout for drilled-in piles. Provide untreated timber with a thickness of at least 3 inches and a bending stress of at least 1,000 pounds per square inch for timber lagging. Provide steel bracing that meets ASTM A36.

(A) Shoring Backfill

Use Class II, Type 1, Class III, Class V or Class VI select material or material that meets AASHTO M 145 for soil classification A-2-4 with a maximum PI of 6 for shoring backfill except do not use A-2-4 soil for backfill around culverts.

(B) Anchors

Store anchor materials on blocking a minimum of 12 inches 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 anchor materials so materials are kept clean and free of damage. Bent, damaged or defective materials will be rejected.

(1) Ground Anchors

Use high-strength deformed steel bars that meet AASHTO M 275 or seven-wire strands that meet ASTM A886 or Article 1070-5 of the *2018 Standard Specifications*. Splice bars in accordance with Article 1070-9 of the *2018 Standard Specifications*. Do not splice strands. Use bondbreakers, spacers and centralizers that meet Article 6.3.5 of the *AASHTO LRFD Bridge Construction Specifications*.

Use neat cement grout that only contains cement and water with a water cement ratio of 0.4 to 0.5 which is approximately 5.5 gallons of water per 94 pounds of Portland cement. Provide grout with a compressive strength at 3 and 28 days of at least 1,500 and 4,000 psi, respectively.

(2) Helical Anchors

Use helical anchors with an ICC Evaluation Service, Inc. (ICC-ES) report. Provide couplers, thread bar adapters and bolts recommended by the Anchor Manufacturer to connect helical anchors together and to piles.

(3) Anchorages

Provide steel plates for bearing plates and steel washers, hex nuts, wedge plates and wedges recommended by the Anchor Manufacturer.

(C) Temporary Walls

(1) Welded Wire Facing

Use welded wire reinforcement for welded wire facing, struts and wires. For temporary wire walls, provide welded wire facing supplied by the Wire Wall Vendor or a manufacturer approved or licensed by the vendor. For temporary wire walls with separate reinforcement and facing components, provide connectors (e.g., bars, clamps, plates, etc.) and fasteners (e.g., bolts, nuts, washers, etc.) required by the Wire Wall Vendor.

(2) Geotextiles

Provide Type 2 geotextile for separation and retention geotextiles. Provide Type 5 geotextile for geotextile reinforcement with ultimate tensile strengths in accordance with the accepted submittals.

(3) Geogrid and Geostrip Reinforcement

Use geogrids with a roll width of at least 4 feet. Use geogrids for geogrid reinforcement and geostrips for geostrip reinforcement with an "approved" status code in accordance with the NCDOT Geosynthetic Reinforcement Evaluation Program. The list of approved geogrids and geostrips is available from: connect.ncdot.gov/resources/Geological/Pages/Products.aspx

Provide geogrids and geostrips with design strengths in accordance with the accepted submittals. Geogrids and geostrips are approved for short-term design strengths (3-year design life) in the machine direction (MD) and cross-machine direction (CD) based on material type. Define material type from the website above for shoring backfill as follows:

Material Type	Shoring Backfill
Borrow	A-2-4 Soil
Fine Aggregate	Class II, Type 1 or Class III Select Material
Coarse Aggregate	Class V or VI Select Material

(4) Welded Wire Grid and Metallic Strip Reinforcement

Provide welded wire grid and metallic strip reinforcement supplied by the Wire Wall Vendor or a manufacturer approved or licensed by the vendor. Use welded wire grid reinforcement ("mesh", "mats" and "ladders") that meet Article 1070-3 of the *2018 Standard Specifications* and metallic strip reinforcement ("straps") that meet ASTM A572 or A1011.

Preconstruction Requirements

(A) Concrete Barrier

Define "clear distance" behind concrete barrier as the horizontal distance between the barrier and edge of pavement. The minimum required clear distance for concrete barrier is shown in the plans. At the Contractor's option or if the minimum required clear distance is not available, set concrete barrier next to and up against traffic side of temporary shoring except for barrier above temporary walls. Concrete barrier with the minimum required clear distance is required above temporary walls.

(B) Temporary Guardrail

Define "clear distance" behind temporary guardrail as the horizontal distance between guardrail posts and temporary shoring. At the Contractor's option or if clear distance for cantilever, braced and anchored shoring is less than 4 feet, attach guardrail to traffic side of shoring as shown in the plans. Place ABC in clear distance and around guardrail posts instead of pavement. Do not use temporary guardrail above temporary walls.

(C) Temporary Shoring Designs

Before beginning temporary shoring design, survey existing ground elevations in the vicinity of shoring locations to determine actual design heights (H). Submit PDF files of working drawings and design calculations for temporary shoring designs in accordance with Article 105-2 of the *2018 Standard Specifications*. Submit working drawings showing plan views, shoring profiles, typical sections and details of temporary shoring design and construction sequence. Do not begin shoring construction until a design submittal is accepted.

Have cantilever and braced shoring designed, detailed and sealed by an engineer licensed in the state of North Carolina. Use a prequalified Anchored Wall Design Consultant to design anchored shoring. Provide anchored shoring designs sealed by a Design Engineer approved as a Geotechnical Engineer (key person) for an Anchored Wall Design Consultant. Include details in anchored shoring working drawings of anchor locations and lock-off loads, unit grout/ground bond strengths for ground anchors or minimum installation torque and torsional strength rating for helical anchors and if necessary, obstructions extending through shoring or interfering with anchors. Include details in the anchored shoring construction sequence of pile and anchor installation, excavation and anchor testing.

Provide temporary wall designs sealed by a Design Engineer licensed in the state of North

Carolina and employed or contracted by the Temporary Wall Vendor. Include details in temporary wall working drawings of geotextile and reinforcement types, locations and directions and obstructions extending through walls or interfering with reinforcement.

(1) Soil Parameters

Design temporary shoring for the assumed soil parameters and groundwater or flood elevations shown in the plans. Assume the following soil parameters for shoring backfill:

(a) Unit weight (γ) = 120 pcf.

(b)

Friction Angle (ϕ)	Shoring Backfill
30°	A-2-4 Soil
34°	Class II, Type 1 or Class III Select Material
38°	Class V or VI Select Material

(c) Cohesion (c) = 0 psf.

(2) Traffic Surcharge

Design temporary shoring for a traffic surcharge of 250 pounds per square foot if traffic will be above and within H of shoring. This traffic surcharge does not apply to construction traffic. Design temporary shoring for any construction surcharge if construction traffic will be above and within H of shoring. Design temporary shoring for a traffic (live load) surcharge in accordance with Article 11.5.6 of the *AASHTO LRFD Bridge Design Specifications*.

(3) Cantilever, Braced and Anchored Shoring Designs

Use shoring backfill for fill sections and voids between cantilever, braced and anchored shoring and the critical failure surface. Use concrete or Type 1 grout for embedded portions of drilled-in H-piles. Do not use drilled-in sheet piles.

Define "top of shoring" for cantilever, braced and anchored shoring as where the grade intersects the back of sheet piles or H-piles and timber lagging. Design cantilever, braced and anchored shoring for a traffic impact load of 2,000 pounds per foot applied 18 inches above top of shoring if concrete barrier is above and next to shoring or temporary guardrail is above and attached to shoring. Extend cantilever, braced and anchored shoring at least 32 inches above top of shoring if shoring is designed for traffic impact. Otherwise, extend shoring at least 6 inches above top of shoring.

Design cantilever, braced and anchored shoring for a maximum deflection of 3 inches if the horizontal distance to the closest edge of pavement or structure is less than H. Otherwise, design shoring for a maximum deflection of 6 inches. Design cantilever and braced shoring in accordance with the plans and *AASHTO Guide Design Specifications for Bridge Temporary Works*.

Design anchored shoring in accordance with the plans and Article 11.9 of the *AASHTO LRFD Bridge Design Specifications*. Use a resistance factor of 0.80 for tensile resistance of anchors with bars, strands or shafts. Extend the unbonded length for ground anchors and the shallowest helix for helical anchors at least 5 feet behind the critical failure surface. Do not extend anchors beyond right-of-way or easement limits. If existing or future obstructions such as foundations, guardrail posts, pavements, pipes, inlets or utilities will interfere with anchors, maintain a clearance of at least 6 inches between obstructions and anchors.

(4) Temporary Wall Designs

Use shoring backfill in the reinforced zone of temporary walls. Separation geotextiles are required between shoring backfill and backfill, natural ground or culverts along the sides of the reinforced zone perpendicular to the wall face. For Class V or VI select material in the reinforced zone, separation geotextiles are also required between shoring backfill and backfill or natural ground on top of and at the back of the reinforced zone.

Design temporary walls in accordance with the plans and Article 11.10 of the *AASHTO LRFD Bridge Design Specifications*. Embed temporary walls at least 18 inches except for walls on structures or rock as determined by the Engineer. Use a uniform reinforcement length throughout the wall height of at least 0.7H or 6 feet, whichever is longer. Extend the reinforced zone at least 6 inches beyond end of reinforcement. Do not locate the reinforced zone outside right-of-way or easement limits.

Use the simplified method for determining maximum reinforcement loads in accordance with the AASHTO LRFD specifications. For geotextile reinforcement, use geotextile properties approved by the Department or default values in accordance with the AASHTO LRFD specifications. For geogrid and geostrip reinforcement, use approved geosynthetic reinforcement properties available from the website shown elsewhere in this provision. Use geosynthetic properties for the direction reinforcement will be installed, a 3-year design life and shoring backfill to be used in the reinforced zone.

Do not use more than 4 different reinforcement strengths for each temporary geosynthetic wall. Design temporary geotextile walls for a reinforcement coverage ratio (R_c) of 1.0. For temporary geogrid walls with an R_c of less than 1.0, use a maximum horizontal clearance between geogrids of 3 feet and stagger reinforcement so geogrids are centered over gaps in the reinforcement layer below.

For temporary geosynthetic walls, use "L" shaped welded wire facing with 18 to 24 inch long legs. Locate geosynthetic reinforcement so reinforcement layers are at the same level as the horizontal legs of welded wire facing. Use vertical reinforcement spacing equal to facing height. Wrap geotextile or geogrid reinforcement behind welded wire facing and extend reinforcement at least 3 feet back behind facing into shoring backfill. Attach geostrip reinforcement to welded

wire facing with a connection approved by the Department.

For temporary wire walls with separate reinforcement and facing components, attach welded wire grid or metallic strip reinforcement to welded wire facing with a connection approved by the Department. For temporary geogrid, geostrip and wire walls, retain shoring backfill at welded wire facing with retention geotextiles and extend geotextiles at least 3 feet back behind facing into backfill.

(D) Preconstruction Meeting

The Engineer may require a shoring preconstruction meeting to discuss the construction, inspection and testing of the temporary shoring. If required and if this meeting occurs before all shoring submittals have been accepted, additional preconstruction meetings may be required before beginning construction of temporary shoring without accepted submittals. The Resident, District or Bridge Maintenance Engineer, Area Construction Engineer, Geotechnical Operations Engineer, Contractor and Shoring Contractor Superintendent will attend preconstruction meetings.

Construction Methods

Control drainage during construction in the vicinity of shoring. Direct run off away from shoring and shoring backfill. Contain and maintain backfill and protect material from erosion.

Install positive protection in accordance with the contract and accepted submittals. Use PCB in accordance with Section 1170 of the *2018 Standard Specifications* and 2018 Roadway Standard Drawing No. 1170.01. Use temporary guardrail in accordance with Section 862 of the *2018 Standard Specifications* and 2018 Roadway Standard Drawing Nos. 862.01, 862.02 and 862.03.

(A) Tolerances

Construct shoring with the following tolerances:

(1) Horizontal wires of welded wire facing are level in all directions,

(2) Shoring location is within 6 inches of horizontal and vertical alignment shown in the accepted submittals, and

(3) Shoring plumbness (batter) is not negative and within 2 degrees of vertical.

(B) Cantilever, Braced and Anchored Shoring Installation

If overexcavation behind cantilever, braced or anchored shoring is shown in the accepted submittals, excavate before installing piles. Otherwise, install piles before excavating for shoring. Install cantilever, braced or anchored shoring in accordance with the construction sequence shown in the accepted submittals. Remove piles and if applicable, timber lagging when shoring is no longer needed.

(1) Pile Installation

Install piles with the minimum required embedment and extension in accordance with Subarticles 450-3(D) and 450-3(E) of the *2018 Standard Specifications* except that a pile driving equipment data form is not required. Piles may be installed with a vibratory hammer as approved by the Engineer.

Do not splice sheet piles. Use pile excavation to install drilled-in H-piles. After filling holes with concrete or Type 1 grout to the elevations shown in the accepted submittals, remove any fluids and fill remaining portions of holes with flowable fill. Cure concrete or grout at least 7 days before excavating.

Notify the Engineer if refusal is reached before pile excavation or driven piles attain the minimum required embedment. When this occurs, a revised design submittal may be required.

(2) Excavation

Excavate in front of piles from the top down in accordance with the accepted submittals. For H-piles with timber lagging and braced and anchored shoring, excavate in staged horizontal lifts with a maximum height of 5 feet. Remove flowable fill and material in between H-piles as needed to install timber lagging. Position lagging with at least 3 inches of contact in the horizontal direction between the lagging and pile flanges. Do not excavate the next lift until timber lagging for the current lift is installed and if applicable, bracing and anchors for the current lift are accepted. Backfill behind cantilever, braced or anchored shoring with shoring backfill.

(3) Anchor Installation

If applicable, install foundations located behind anchored shoring before installing anchors. Fabricate and install ground anchors in accordance with the accepted submittals, Articles 6.4 and 6.5 of the *AASHTO LRFD Bridge Construction Specifications* and the following unless otherwise approved:

(a) Materials in accordance with this provision are required instead of materials conforming to Articles 6.4 and 6.5.3 of the AASHTO LRFD Specifications,

(b) Encapsulation-protected ground anchors in accordance with Article 6.4.1.2 of the AASHTO LRFD specifications are not required, and

(c) Corrosion protection for unbonded lengths of ground anchors and anchorage covers are not required.

(d) Mix and place neat cement grout in accordance with Subarticles 1003-5, 1003-6 and 1003-7 of the *2018 Standard Specifications*. Measure grout temperature, density and flow during grouting with at least the same frequency grout cubes are made for compressive strength. Perform density

and flow field tests in the presence of the Engineer in accordance with American National Standards Institute/American Petroleum Institute Recommended Practice 13B-1 (Section 4, Mud Balance) and ASTM C939 (Flow Cone), respectively.

Install helical anchors in accordance with the accepted submittals and Anchor Manufacturer's instructions. Measure torque during installation and do not exceed the torsional strength rating of the helical anchor. Attain the minimum required installation torque and penetration before terminating anchor installation. When replacing a helical anchor, embed last helix of the replacement anchor at least 3 helix plate diameters past the location of the first helix of the previous anchor.

(4) Anchor Testing

Proof test and lock-off anchors in accordance with the accepted submittals and Article 6.5.5 of the *AASHTO LRFD Bridge Construction Specifications* except for the acceptance criteria in Article 6.5.5.5. For the AASHTO LRFD specifications, "ground anchor" refers to a ground or helical anchor and "tendon" refers to a bar, strand or shaft.

(a) Anchor Acceptance

Anchor acceptance is based in part on the following criteria.

(i) For ground and helical anchors, total movement is less than 0.04 inches between the 1 and 10 minute readings or less than 0.08 inches between the 6 and 60 minute readings.

(ii) For ground anchors, total movement at maximum test load exceeds 80% of the theoretical elastic elongation of the unbonded length.

(b) Anchor Test Results

Submit PDF files of anchor test records including movement versus load plots for each load increment within 24 hours of completing each row of anchors. The Engineer will review the test records to determine if the anchors are acceptable.

If the Engineer determines an anchor is unacceptable, revise the anchor design or installation methods. Submit a revised anchored shoring design for acceptance and provide an acceptable anchor with the revised design or installation methods. If required, replace the anchor or provide additional anchors with the revised design or installation methods.

(C) Temporary Wall Installation

Excavate as necessary for temporary walls in accordance with the plans and accepted submittals. If applicable, install foundations located in the reinforced zone before placing shoring backfill or reinforcement unless otherwise approved. Notify the Engineer when

foundation excavation is complete. Do not place shoring backfill or reinforcement until excavation dimensions and foundation material are approved.

Erect welded wire facing so the wall position is as shown in the plans and accepted submittals. Set welded wire facing adjacent to each other in the horizontal and vertical direction to completely cover the wall face with facing. Stagger welded wire facing to create a running bond by centering facing over joints in the row below.

Attach geostrip reinforcement to welded wire facing and wrap geotextile reinforcement and retention geotextiles behind welded wire facing as shown in the plans and accepted submittals. Cover geotextiles with at least 3" of shoring backfill. Overlap adjacent geotextile reinforcement and retention and separation geotextiles at least 18 inches with seams oriented perpendicular to the wall face. Hold geotextiles in place with wire staples or anchor pins as needed.

Place reinforcement within 3 inches of locations shown in the plans and accepted submittals. Before placing shoring backfill, pull geosynthetic reinforcement taut so it is in tension and free of kinks, folds, wrinkles or creases. Install reinforcement with the direction shown in the plans and accepted submittals. For temporary wire walls with separate reinforcement and facing components, attach welded wire grid or metallic strip reinforcement to welded wire facing as shown in the accepted submittals. Do not splice or overlap reinforcement so seams are parallel to the wall face. Contact the Engineer when unanticipated existing or future obstructions such as foundations, pavements, pipes, inlets or utilities will interfere with reinforcement.

Place shoring backfill in the reinforced zone in 8 to 10 inch thick lifts. Compact A-2-4 soil and Class II, Type 1 and Class III select material in accordance with Subarticle 235-3(C) of the *2018 Standard Specifications*. Use only hand operated compaction equipment to compact backfill within 3 feet of welded wire facing. At a distance greater than 3 feet, compact shoring backfill with at least 4 passes of an 8 to 10 ton vibratory roller in a direction parallel to the wall face. Smooth wheeled or rubber tired rollers are also acceptable for compacting backfill. Do not use sheepsfoot, grid rollers or other types of compaction equipment with feet. Do not displace or damage reinforcement when placing and compacting shoring backfill. End dumping directly on geosynthetics is not permitted. Do not operate heavy equipment on reinforcement until it is covered with at least 8 inches of shoring backfill. Replace any damaged reinforcement to the satisfaction of the Engineer.

Backfill for temporary walls outside the reinforced zone in accordance with Article 410-8 of the *2018 Standard Specifications*. Bench temporary walls into the sides of excavations where applicable. For temporary geosynthetic walls with top of wall within 5 feet of finished grade, remove top facing and incorporate top reinforcement layer into fill when placing fill in front of wall. Temporary walls remain in place permanently unless otherwise required.

Measurement and Payment

Temporary Shoring will be measured and paid in square feet. Temporary walls will be measured as the square feet of exposed wall face area. Cantilever, braced or anchored shoring will be

measured as the square feet of exposed shoring face area with the shoring height equal to the difference between the top and bottom of shoring elevations. Define "top of shoring" as where the grade intersects the back of sheet piles or H-piles and timber lagging. Define "bottom of shoring" as where the grade intersects front of sheet piles or H-piles and timber lagging. No measurement will be made for any embedment, shoring extension above top of shoring or pavement thickness above temporary walls.

The contract unit price for *Temporary Shoring* will be full compensation for providing shoring designs, submittals and materials, excavating, backfilling, hauling and removing excavated materials and supplying all labor, tools, equipment and incidentals necessary to construct temporary shoring.

No payment will be made for temporary shoring not shown in the plans or required by the Engineer including shoring for OSHA reasons or the Contractor's convenience. No value engineering proposals will be accepted based solely on revising or eliminating shoring locations shown in the plans or estimated quantities shown in the bid item sheets as a result of actual field measurements or site conditions.

PCB will be measured and paid in accordance with Section 1170 of the *2018 Standard Specifications*. No additional payment will be made for anchoring PCB for temporary shoring. Costs for anchoring PCB will be incidental to temporary shoring.

Temporary guardrail will be measured and paid for in accordance with Section 862 of the *2018 Standard Specifications*.

Payment will be made under:

Pay Item	**Pay Unit**
Temporary Shoring	Square Foot

MATERIAL AND EQUIPMENT STORAGE & PARKING OF PERSONAL VEHICLES:

11-17-21(Rev. 8-16-22) 1101 SP11 R03

Revise the *2018 Standard Specifications* as follows:

Page 11-2, Article 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, Article 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 Article 1101-8 or as directed by the Engineer before use.

WORK ZONE INSTALLER:

(7-20-21)(Rev. 8-16-22) 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 or other NCDOT approved training provider 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 or other NCDOT approved training provider.

All certification records for qualified work zone installers and flaggers shall be uploaded by the approved training agency or other NCDOT approved training provider to the Department's Work Zone Education Verification App (WZ-EVA) prior to the qualified work zone installer or flagger performing any traffic control duties on the project. For more information about WZ-EVA, see the Work Zone Safety Training webpage.

PORTABLE CHANGEABLE MESSAGE SIGNS:

(9-20-22)(Rev. 11-15-22) 1089, 1120 SP11 R10

Revise the *2018 Standard Specifications* as follows:

Page 10-197, Subarticle 1089-7(D) Controller, line 16, add the following after the third sentence of the first paragraph:

Change the controller password from the factory default and periodically change the controller password to deter unauthorized programming of the controller.

Page 10-197, Subarticle 1089-7(D) Controller, lines 16-19, replace the forth sentence of the first paragraph with the following:

The password system is recommended to include at least two levels of security such that operators at one level may only change message sequences displayed using preprogrammed sequences and operators at a higher level may create and store messages or message sequences.

Page 10-197, Subarticle 1089-7(D) Controller, line 24 replace the sentence with the following:

The controller shall be stored in a locked, weather and vandal resistant box when not in use and after changes to the messages are made.

Page 11-8, Article 1120-3 CONSTRUCTION METHODS, lines 26-32, replace the second paragraph with the following:

Provide an experienced operator for the portable changeable message sign during periods of operation to ensure that the messages displayed on the sign panel are in accordance with the plans and Subarticle 1089-7(D). Change the controller password from the factory default and periodically change the controller password to deter unauthorized programming of the controller. Using two levels of password security is recommended such that operators at one level may only change message sequences displayed using preprogrammed sequences and operators at a higher level may create and store messages or message sequences. Lock the controller in a weather and vandal resistant box when not in use and after changes to the messages are made.

LAW ENFORCEMENT:

(6-21-22)(Rev. 11-15-22) 1190 SP11 R30

Revise the *2018 Standard Specifications* as follows:

Page 11-19, Article 1190-1 DESCRIPTION, lines 4-5, replace the paragraph with the following:

Furnish Law Enforcement Officers and official Law Enforcement vehicles to direct traffic in accordance with the contract.

Page 11-19, Article 1190-2 CONSTRUCTION METHODS, lines 7-10, replace the first and second paragraph with the following:

Use off duty uniformed Law Enforcement Officers and official Law Enforcement vehicles equipped with blue lights to direct or control traffic as required by the plans or by the Engineer.

Law Enforcement vehicles shall not be parked within the buffer space on any roadway. Law Enforcement vehicles shall not be used to close or block an active travel lane on multilane roadways with a posted speed limit of 45 MPH or higher, except as allowed during rolling roadblock operations as shown in the *Roadway Standard Drawings* or while responding to an emergency.

Page 11-19, Article 1190-3 MEASUREMENT AND PAYMENT, lines 14-15, replace the second sentence of the first paragraph with the following:

There will be no direct payment for official Law Enforcement vehicles as they are considered incidental to the pay item.

EXTRUDED THERMOPLASTIC PAVEMENT MARKING THICKNESS:

3-19-19 (Rev. 6-21-22) 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 the required thickness above the surface of the pavement as shown in Table 1205-3.

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.

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
Korean Lespedeza
Weeping Lovegrass
Carpetgrass
Bermudagrass
Browntop Millet
German Millet – Strain R
Clover – Red/White/Crimson

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
Crownvetch
Pensacola Bahiagrass
Creeping Red Fescue
Japanese Millet
Reed Canary Grass
Zoysia

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

STANDARD SPECIAL PROVISION

ERRATA

(10-16-18) (Rev. 6-20-23) Z-4

Revise the *2018 Standard Specifications* as follows:

Division 1

Page 1-1, Article 101-2 Abbreviations, line 13, replace " American National Standards Institute, Inc." with "American National Standards Institute".

Page 1-1, Article 101-2 Abbreviations, line 32, replace "Equivalent Single Axis Load" with "Equivalent Single Axle Load".

Page 1-16, Subarticle 102-9(A) General, line 26, replace "10 U.S.C. 2304(g)" with "10 U.S.C. 3205".

Page 1-43, Article 104-13 RECYCLED PRODUCTS OR SOLID WASTE MATERIALS, line 4, replace "104-13(B)(2)" with "104-13(B)".

Page 1-52, Article 106-1 RECYCLED PRODUCTS OR SOLID WASTE MATERIALS, line 25, replace "13 NCAC 7CF.0101(a)(99)" with "29 CFR 1910.1200".

Page 1-79, Article 109-1 MEASUREMENT AND PAYMENT, Test Method prior to line 34, replace "AASHTO M 32" with "AASHTO M 336".

Division 2

Page 2-5, Article 210-2 CONSTRUCTION METHODS, line 21, replace " NCGS §§ 130A-444 to -452" with "NCGS §§ 130A-444 to -453".

Page 2-13, Article 225-2 EROSION CONTROL REQUIREMENTS, line 17, replace "the Sedimentation and Pollution Control Act" with "Article 107-12".

Page 2-20, Subarticle 230-4(B)(3) Reclamation Plan, line 12, replace " Department's borrow and waste site reclamation procedures for contracted projects" with "Department's *Borrow Waste and Staging Site Reclamation Procedures for Contract Projects*".

Page 2-25, Subarticle 235-3(E) Surcharges and Waiting Periods, line 21 and 27, delete "Department's Materials and Tests Unit.".

Page 2-27, Article 240-4 MEASUREMENT AND PAYMENT, line 23, replace "Section 225" with "Article 225-7".

Page 2-30, Article 275-4 MEASUREMENT AND PAYMENT, line 33, replace "Section 815" with "Article 815-4".

Division 4

Page 4-18, Subarticle 411-5(C)(3) Coring, line 11, replace "in accordance with ASTM D5079" with "with methods acceptable to the Engineer".

Page 4-50, Article 430-2 MATERIALS, prior to line 15, replace Section "1080-9" with "1080-7".

Page 4-53, Article 440-2 MATERIALS, prior to line 6, replace Section "1080-9" with "1080-7".

Page 4-58, Article 442-2 MATERIALS, prior to line 15, replace Section "1080-6" with "1080-12".

Page 4-59, Subarticle 442-7(A) Blast Cleaning, line 36, replace Article "1080-6" with "1080-12".

Page 4-76, Article 454-2 MATERIALS, prior to line 24, replace Section "815-2" with "1044".

Page 4-79, Article 455-2 MATERIALS, prior to line 21, replace Section "815" with "1044".

Page 4-80, Subarticle 455-3(B) Precast Gravity Wall Designs, line 23 and lines 25-26, replace "AASHTO LRFD specifications" with "*AASHTO LRFD Bridge Design Specifications*".

Page 4-84, Article 458-5 MEASUREMENT AND PAYMENT, line 31, replace article number "454-1" with "458-1".

Division 6

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

Page 6-10, Subarticle 609-6(C) Control Charts, line 17, replace Section number "7021" with "7.20.1".

Page 6-13, Article 609-9 QUALITY ASSURANCE, line 31, replace Section number "7.60" with "7.6".

Page 6-26, Subarticle 610-13(A)(1) Acceptance for New Construction, line 31, replace Table number "610-7" with "610-8".

Page 6-29, Subarticle 610-13(B) North Carolina Hearne Straightedge, line 32, replace Table number "610-8" with "610-9".

Page 6-31, Article 610-14 DENSITY ACCEPTANCE, Specified Density prior to line 30 and line 32, replace Table number "610-6" with "610-7".

Page 6-37, Article 650-5 CONSTRUCTION METHODS, line 10, replace Section number "9.5(E)" with "9.5.1(E)".

Page 6-44, Subarticle 660-8(B) Asphalt Mat and Seal, line 40, replace Subarticle number "660-8(A)" with "660-8(C)".

Page 6-44, Subarticle 660-8(B) Asphalt Mat and Seal, line 42, replace Subarticle number "660-8(C)" with "660-8(A)".

Division 7

Page 7-11, Subarticle 700-15(E) Compressive Strength, line 5, replace "AASHTO T 23" with "AASHTO R 100".

Page 7-24, Article 723-4 Very High Early Strength Concrete for Concrete Pavement Repair, line 4, replace "AASHTO T126" with "AASHTO R 39".

Page 7-24, Article 723-5 MEASUREMENT AND PAYMENT, line 34, replace "Section 225" with "Article 225-7".

Page 7-24, Article 723-5 MEASUREMENT AND PAYMENT, line 36, replace "Section 270" with "Article 270-4".

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 8

Page 8-11, Article 815-1 MATERIALS, after line 35, replace "1080-12" with "1080-10".

Page 8-13, Article 816-1 MATERIALS, after line 28, replace "1080-12" with "1080-10".

Page 8-17, Article 825-1 Description, line 5, delete "853" and "855".

Division 10

Page 10-2, Subarticle 1000-3(B) Air Entrainment, line 33, replace "Chase" with "Chace".

Page 10-4, Subarticle 1000-4(A) Composition and Design, after line 17, replace "T23" with "R100".

Page 10-4, Subarticle 1000-4(B) Air Entrainment, line 31 and 33, replace "Chase" with "Chace".

Page 10-4, Subarticle 1000-4(C) Strength of Concrete, line 39 and 41, replace "T 23" with "R 100".

Page 10-15, Subarticle 1000-11(B) Mixing Time for Central Mixed Concrete, after line 35, replace "T 23" with "R 100".

Page 10-22, Article 1003-3 COMPOSITION AND DESIGN, line 9, replace "Engineer" with "engineer".

Page 10-23, Article 1003-4 GROUT REQUIREMENTS, line 16 and 18, replace "T 23" with "R 100".

Page 10-26, Article 1005-4 TESTING, after line 26, replace "1014-2€(6)" with "1014-2€(6)"in C. of Table 1005-1 footnote and replace "Lightweight[B]" with "Lightweight[C]".

Page 10-29, Subarticle 1012-1(B)(4) Flat and Elongated Pieces, line 44, delete "SF9.5A"

Page 10-36, Subarticle 1012-2(E) Toughness (Resistance to Abrasion), line 31, replace "course" with "coarse".

Page 10-37, Article 1012-4, LIGHTWEIGHT AGGREGATE, line 4, replace Table number "1012-8" with "1012-5".

Page 10-48, Subarticle 1020-10(A) Mineral Fibers, line 27, replace "Table 1012-5" with "Table 1020-2".

Page 10-52, Article 1024-5 FLY ASH, line 12, replace "Table 2" with "Table 3".

Page 10-60, Subarticle 1032-6(F) Joint Materials, line 15, replace "AASHTO M 198" with "ASTM C990" and delete "Type B".

Page 10-61, Article 1034-3 CONCRETE SEWER PIPE, line 33, replace "AASHTO M 198" with "ASTM C990" and delete "Type A or B".

Page 10-64, Article 1040-1 BRICK, line 12, replace "ASTM C62" with "ASTM C62 or ASTM C216".

Page 10-67, Article 1044-7 CORRUGATED PLASTIC PIPE AND FITTINGS, line 24, replace "AASHTO M 294 for heavy duty tubing" with "Article 1032-7 and AASHTO M 252".

Page 10-68, Subarticle 1046-3(D) Offset Blocks, lines 30-32, delete "Before beginning the installation of recycled offset block, submit the FHWA acceptance letter for each type of block to the Engineer for approval."

Page 10-69, Subarticle 1046-3(D) Offset Blocks, before line 1, replace "WIRE DIAMETER" with "COMPOSITE OFFSET BLOCKS" as the title of Table 1046-1, delete "Testing" property and associated requirement from Table 1046-1, and replace "Approval" requirement of "Approved for use by the FHWA" with "Approved for use on the NCDOT APL" in Table 1046-1.

Page 10-80, Article 1060-2 FERTILIZER, line 18, replace "North Carolina Fertilizer Law" with "North Carolina Commercial Fertilizer Law".

Page 10-83, Article 1060-9 WATER, line 9, replace "15 NCAC 2B.0200" with "15A NCAC 02B.0200".

Page 10-86, Article 1070-3 COLD DRAWN STEEL WIRE AND WIRE REINFORCEMENT, line 23 and 25, replace "M 32" and "M 55" with "M 336".

Page 10-87, Article 1070-6 DOWELS AND TIE BARS FOR PORTLAND CEMENT CONCRETE PAVEMENT, line 17, replace "AASHTO M 32" with "AASHTO M 336".

Page 10-88, Subarticle 1070-7(D) Handling, Storage and Transportation, line 40, replace "Section" with "Subarticle".

Page 10-89, Article 1070-8 SPIRAL COLUMN REINFORCING STEEL, line 21, replace "AASHTO M 32" with "AASHTO M 336".

Page 10-91, Article 1072-3 BEARING PLATE ASSEMBLIES, line 44, replace "Article 1080-9" with "Article 1080-7".

Page 10-92, Subarticle 1072-5(A) General, after line 30, replace "SAMPLING REQUIREMENTS FOR HIGH STRENGTH BOLTS, NUTS AND WASHERS" with "SAMPLING REQUIREMENTS FOR HIGH STRENGTH BOLTS, NUTS AND WASHERS TO INCLUDE DIRECT TENSION INDICATORS" as the title of Table 1072-1.

Page 10-95, Subarticle 1072-5(D)(7)(a) Mill Test Report(s), line 18, replace title with "Mill Test Report(s) (MTR)".

Page 10-95, Subarticle 1072-5(D)(7)(b) Manufacturer Certified Test Report(s), line 24, replace title with "Manufacturer Certified Test Report(s) (MCTR)".

Page 10-96, Subarticle 1072-5(D)(7)(c) Distributor Certified Test Report(s), line 1, replace title with "Distributor Certified Test Report(s) (DCTR)".

Page 10-98, Subarticle 1072-5(F) Galvanized High Strength Bolts, Nuts and Washers, line 11, replace "Article 1080-9" with "Article 1080-7".

Page 10-111, Subarticle 1072-18(B) General, line 24, replace "Structural Welding Code-Reinforcing Steel" with "Structural Welding Code-Steel Reinforcing Bars".

Page 10-117, Article 1074-1 WELDING, lines 21-22, replace "Structural Welding Code-Reinforcing Steel" with "Structural Welding Code-Steel Reinforcing Bars".

Page 10-119, Article 1074-7(B) Gray Iron Castings, line 16, replace "M306" with "AASHTO M 306".

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

Page 10-125, Subarticle 1077-5(B) Testing, line 31, replace "T 23" with "R 100".

Page 10-131, Subarticle 1078-4(A) Composition and Design, after line 23, in Table 1078-2 replace "T 23" with "R 100".

Page 10-135, Subarticle 1078-4(J)(2) Mixing Time for Central Mixed Concrete, line 46, replace "Table 1078-2" with "Table 1078-3"

Page 10-136, Subarticle 1078-4(J)(2) Mixing Time for Central Mixed Concrete, after line 17, replace "T23" with "R100".

Page 10-153, Subarticle 1079-1 PREFORMED BEARING PADS, line 8, replace "MIL-C882-D" with "MIL-C-882-E".

Page 10-154, Subarticle 1079-2(A) General, line 6, delete "and 1079-2(E)".

Page 10-156, Article 1080-5 SELF-CURING INORGANIC ZINC PAINT, line 8, replace "AASHTO M 252" with "AASHTO M 300".

Page 10-156, Article 1080-5 SELF-CURING INORGANIC ZINC PAINT, line 20, replace "AASHTO M 253" with "AASHTO M 300".

Page 10-156, Subarticle 1080-9(A) Composition, line 40, replace "Tables 1080-7 through 1080-14" with "Tables 1080-1 through 1080-3".

Page 10-157, Subarticle 1080-9(B) Properties, line 5, replace "Tables 1080-7 through 1080-14" with "Tables 1080-1 through 1080-3".

Page 10-157, Subarticle 1080-9(B) Properties, line 35, replace "Materials and Tests Standards CLS-P-1.0" with "*Structural Steel Shop Coatings Program*".

Page 10-159, Subarticle 1080-9(E) Color Variation, Table 1080-1, replace "ASTM D1159" with "ASTM D1199".

Page 10-159, Subarticle 1080-9(E) Color Variation, Table 1080-1, replace "NCDOT M&T P-10" with "ASTM D6280".

Page 10-161, Subarticle 1080-9(E) Color Variation, Table 1080-3, replace "ASTM D13278" and "ASTM D3278".

Page 10-161, Subarticle 1080-9(E) Color Variation, Table 1080-3, replace "NCDOT M&T P-10" and "Structural Steel Shop Coatings Program".

Page 10-161, Subarticle 1080-9(E) Color Variation, Table 1080-3, add Test Method "ASTM D4400" for the Leneta Sag Test property in Table 1080-3.

Page 10-161, Subarticle 1080-9(E) Color Variation, Table 1080-3, add Test Method "ASTM D523" for the Gloss, Specular property in Table 1080-3.

Page 10-161, Subarticle 1080-9(E) Color Variation, Table 1080-3, replace Test Method "ASTM" with "ASTM E70" for the pH property in Table 1080-3.

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".

Page 10-166, Subarticle 1081-1(E) Prequalification, line 24, replace "Value Management Unit" with "Product Evaluation Program".

Page 10-168, Subarticle 1081-3(A) Physical Requirements, after line 25, replace "Subarticle 1081-4(B)" with "Subarticle 1081-3(B)" in Table 1081-2.

Page 10-168, Subarticle 1087-2(A) Paint Composition, lines 19-20, replace "Federal Specification TTP 1952F" with "Federal Specification TT-P-1952".

Page 10-200, Subarticle 1090-1(C) Anchor Bolts, line 38, replace ASTM number "A325" with "F3125".

Page 10-202, Subarticle 1091-3(F) Solid Wall HDPE Conduit, line 5, replace ", Table 1091-1, 1091-2 and 1091-3" with "and Table 1091-1".

Page 10-208, Subarticle 1094-1(A) Breakaway or Simple Steel Beam Sign Supports, line 19, replace ASTM number "A325" with "F3125".

Page 10-209, Subarticle 1094-1(D) Steel Square Tube Posts, line 10, replace ASTM number "A123" with "A653".

Page 10-209, Subarticle 1094-1(E) Wood Supports, line 17, replace "Article 1082-2 and 1082-3" with "Section 1082".

Page 10-212, Subarticle 1098-1(H) Electrical Service, line 21, replace "NEMA Type 3R" with "NEMA 3R".

Page 10-212, Subarticle 1098-1(H) Electrical Service, line 36, replace "UL Standard 231" with "UL Standard UL-231".

Page 10-212, Subarticle 1098-1(H) Electrical Service, line 37, replace "UL Standard 67" with "UL Standard UL-67".

Page 10-224, Subarticle 1098-14(H)(1) Type I – Pedestrian Pushbutton Post, line 3, replace ASTM number "325" with "F3125".

Page 10-224, Article 1098-16 CABINET BASE ADAPTER/EXTENDER, line 33, replace Section number "6.7" with "6.8".

Division 14

Page 14-11, Subarticle 1401-2(B) Lowering Device, line 36, replace Military Specification "MIL-W-83420E" with "MIL-DTL-83420".

Page 14-22, Article 1412-2 MATERIALS, line 29, replace UL Standard "1572" with "1598".

Division 15

Page 15-6, Subarticle 1510-3(B) Testing and Sterilization, line 40, replace Section number "4.4.3" with "4.4".

Page 15-14, Article 1525-2 MATERIALS, line 9, replace "AASHTO M 198" with "ASTM C990".

Page 15-14, Article 1525-2 MATERIALS, lines 17-18, delete "in the Grout Production and Delivery provision".

Page 15-19, Article 1550-2 MATERIALS, line 16, replace "*AASHTO LRFD Bridge Design Specifications*" with "*AASHTO LRFD Bridge Construction Specifications*".

Division 16

Page 16-9, Article 1630-3 MEASUREMENT AND PAYMENT, line 7, replace "Section 225" with "Article 225-7".

Page 16-9, Article 1630-3 MEASUREMENT AND PAYMENT, line 8, replace "Section 230" with "Article 230-5".

Page 16-16, Article 1637-5 MEASUREMENT AND PAYMENT, line 17, replace "Section 310" with "Article 310-6".

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

Page 17-15, Subarticle 1715-3(E) Bore and Jack, line 5, replace article number "1540-4" with "1550-4".

Page 17-15, Subarticle 1715-3(E) Bore and Jack, lines 10 & 11, replace "*NCDOT Policies and Procedures for Accommodating Utilities on Highway Rights of Way*" with "*NCDOT Utilities Accommodations Manual*".

STANDARD SPECIAL PROVISION

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.

STANDARD SPECIAL PROVISION

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.

STANDARD SPECIAL PROVISION

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. ***Note:*** 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)*

(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, Non-discrimination 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, 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.)

STANDARD SPECIAL PROVISION

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

STANDARD SHORING (10/19/2021)	GT-1.1 - GT-1.4
AGGREGATE SUBGRADE (SPECIAL)	GT-2.1 - GT-2.1

DocuSigned by:
Geotechnical Engineering Unit
E06538624A11498...
06/12/2023

STANDARD SHORING: **(10-19-21)**

Description

Standard shoring includes standard temporary shoring and standard temporary mechanically stabilized earth (MSE) walls. At the Contractor's option, use standard shoring as noted in the plans or as directed. When using standard shoring, a temporary shoring design submittal is not required. Construct standard shoring based on actual elevations and shoring dimensions in accordance with the contract and Geotechnical Standard Detail No. 1801.01 or 1801.02.

Define "standard temporary shoring" as cantilever shoring that meets the standard temporary shoring detail (Geotechnical Standard Detail No. 1801.01). Define "standard temporary wall" as a temporary MSE wall with geotextile or geogrid reinforcement that meets the standard temporary wall detail (Geotechnical Standard Detail No. 1801.02). Define "standard temporary geotextile wall" as a standard temporary wall with geotextile reinforcement and "standard temporary geogrid wall" as a standard temporary wall with geogrid reinforcement.

Provide positive protection for standard shoring at locations shown in the plans and as directed. See *Temporary Shoring* provision for positive protection types and definitions.

Materials

Refer to the *Standard Specifications*.

Item	Section
Concrete Barrier Materials	1170-2
Flowable Fill, Excavatable	1000-6
Geosynthetics	1056
Grout, Type 1	1003
Portland Cement Concrete, Class A	1000
Select Materials	1016
Steel Beam Guardrail Materials	862-2
Steel Sheet Piles and H-Piles	1084
Untreated Timber	1082-2
Welded Wire Reinforcement	1070-3

Provide Type 6 material certifications for shoring materials. Use Class IV select material for temporary guardrail. Use Class A concrete that meets Article 450-2 of the *Standard Specifications* or Type 1 grout for drilled-in piles.

Based on actual shoring height, positive protection, groundwater elevation, slope or surcharge case and traffic impact at each standard temporary shoring location, use sheet piles with the minimum required section modulus or H-piles with the sizes shown in Geotechnical Standard Detail No. 1801.01. Use untreated timber with a thickness of at least 3" and a bending stress of at least 1,000 psi for timber lagging.

(A) Shoring Backfill

Use Class II, Type 1, Class III, Class V or Class VI select material or material that meets AASHTO M 145 for soil classification A-2-4 with a maximum PI of 6 for shoring backfill except do not use the following:

(1) A-2-4 soil for backfill around culverts,

(2) A-2-4 soil in the reinforced zone of standard temporary walls with a back slope and

(3) Class VI select material in the reinforced zone of standard temporary geotextile walls.

(B) Standard Temporary Walls

Use welded wire reinforcement for welded wire facing, struts and wires with the dimensions and minimum wire sizes shown in Geotechnical Standard Detail No. 1801.02. Provide Type 2 geotextile for separation and retention geotextiles. Do not use more than 4 different reinforcement strengths for each standard temporary wall.

(1) Geotextile Reinforcement

Provide Type 5 geotextile for geotextile reinforcement with a mass per unit area of at least 8 oz/sy in accordance with ASTM D5261. Based on actual wall height, groundwater elevation, slope or surcharge case and shoring backfill to be used in the reinforced zone at each standard temporary geotextile wall location, provide geotextiles with ultimate tensile strengths as shown in Geotechnical Standard Detail No. 1801.02.

(2) Geogrid Reinforcement

Use geogrids for geogrid reinforcement with a roll width of at least 4 ft and an "approved" status code in accordance with the NCDOT Geosynthetic Reinforcement Evaluation Program. The list of approved geogrids is available from:
connect.ncdot.gov/resources/Geological/Pages/Products.aspx

Based on actual wall height, groundwater or flood elevation, slope or surcharge case and shoring backfill to be used in the reinforced zone at each standard temporary geogrid wall location, provide geogrids for geogrid reinforcement with short-term design strengths as shown in Geotechnical Standard Detail No. 1801.02. Geogrids are approved for short-term design strengths (3-year design life) in the machine direction (MD) and cross-machine direction (CD) based on material type. Define material type from the website above for shoring backfill as follows:

Material Type	Shoring Backfill
Borrow	A-2-4 Soil
Fine Aggregate	Class II, Type 1 or Class III Select Material
Coarse Aggregate	Class V or VI Select Material

Preconstruction Requirements

(A) Concrete Barrier

Define "clear distance" behind concrete barrier as the horizontal distance between the barrier and edge of pavement. The minimum required clear distance for concrete barrier is shown in the plans. At the Contractor's option or if the minimum required clear distance is not available, set concrete barrier next to and up against traffic side of standard shoring except for barrier above standard temporary walls. Concrete barrier with the minimum required clear distance is required above standard temporary walls.

(B) Temporary Guardrail

Define "clear distance" behind temporary guardrail as the horizontal distance between guardrail posts and standard shoring. At the Contractor's option or if clear distance for standard temporary shoring is less than 4 ft, attach guardrail to traffic side of shoring as shown in the plans. Place ABC in clear distance and around guardrail posts instead of pavement. Do not use temporary guardrail above standard temporary walls.

(C) Standard Shoring Selection Forms

Before beginning standard shoring construction, survey existing ground elevations in the vicinity of standard shoring locations to determine actual shoring or wall heights (H). Submit a standard shoring selection form for each location at least 7 days before starting standard shoring construction. Standard shoring selection forms are available from: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx

Construction Methods

Construct standard shoring in accordance with the *Temporary Shoring* provision.

(A) Standard Temporary Shoring Installation

Based on actual shoring height, positive protection, groundwater elevation, slope or surcharge case and traffic impact at each standard temporary shoring location, install piles with the minimum required embedment and extension for each shoring section in accordance with Geotechnical Standard Detail No. 1801.01. For concrete barrier above and next to standard temporary shoring and temporary guardrail above and attached to standard temporary shoring, use "surcharge case with traffic impact" in accordance with Geotechnical Standard Detail No. 1801.01. Otherwise, use "slope or surcharge case with no traffic impact" in accordance with Geotechnical Standard Detail No. 1801.01. If refusal is reached before driven piles attain the minimum required embedment, use drilled-in H-piles with timber lagging for standard temporary shoring.

(B) Standard Temporary Walls Installation

Based on actual wall height, groundwater elevation, slope or surcharge case, geotextile or geogrid reinforcement and shoring backfill in the reinforced zone at each standard temporary wall location, construct walls with the minimum required reinforcement length and number of reinforcement layers for each wall section in accordance with Geotechnical Standard Detail No. 1801.02. For standard temporary walls with pile foundations in the reinforced zone, drive piles through reinforcement after constructing temporary walls.

For standard temporary walls with interior angles less than 90°, wrap geosynthetics at acute corners as directed by the Engineer. Place geosynthetics as shown in Geotechnical Standard Detail No. 1801.02. Place separation geotextiles between shoring backfill and backfill, natural ground or culverts along the sides of the reinforced zone perpendicular to the wall face. For Class V or VI select material in the reinforced zone, place separation geotextiles between shoring backfill and backfill or natural ground on top of and at the back of the reinforced zone.

Measurement and Payment

Standard shoring will be measured and paid in accordance with the *Temporary Shoring* provision.

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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11/29/2022

AGGREGATE SUBGRADE (SPECIAL)

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.

NORTH CAROLINA PROFESSIONAL SEAL 030943 ENGINEER THEIN TUN ZAN

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Thein Tun Zan
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05/30/2023

PROJECT SPECIAL PROVISIONS
GEOENVIRONMENTAL

CONTAMINATED SOIL (12/13/2022)

The Contractor's attention is directed to the fact that soil contaminated with petroleum hydrocarbon compounds exist within the project area. The known 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", "R-5705A", "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	Pay Unit
Hauling and Disposal of Petroleum Contaminated Soil	Ton

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Ethan J. Caldwell
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12/13/2022

NORTH CAROLINA PROFESSIONAL SEAL 036892 ENGINEER Ethan J. Caldwell

PROJECT SPECIAL PROVISIONS
Utility Construction - Harnett Regional Water

KCI ASSOCIATES OF NC
ISO 9001:2015 CERTIFIED
ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS
4505 Falls of Neuse Rd., Suite 400 • Raleigh, NC 27609 • Phone 919-783-9214 • Fax 919-783-9266

NORTH CAROLINA PROFESSIONAL SEAL 039117 ENGINEER TUCKER R. MARTIN
DocuSigned by: Tucker Martin
6/13/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Where brand names and model numbers are specified in these Special Provisions or in the plans, the cited examples are used only to denote the quality standard of product desired and do not restrict bidders to a specific brand, make, or manufacturer. They are provided to set forth the general style, type, character, and quality of the product desired. Equivalent products will be acceptable.

The utility owner is Harnett Regional Water. The contact person is Mr. Chad Everette and he can be reached by phone at 910-893-7575.

The provisions contained within these Utilities Construction Project Special Provisions modify the Standard Specifications only for materials used and work performed constructing water or sewer facilities owned by Harnett Regional Water.

Revise the 2018 Standard Specifications as follows:

Page 10-63, Article 1036-8 SLEEVES, COUPLINGS, AND MISCELLANEOUS, paragraph (B) Transition Sleeves and Couplings, add the following paragraphs:

Where a restrained coupling is required, the restraint mechanism shall include actuating gripping surfaces to maximize restraint capability and have torque limiting twist off nuts to ensure proper

actuating of the restraint devices. Ductile Iron components shall meet or exceed the requirements of ASTM A536. Sealing gaskets shall be constructed of SBR and shall be certified to the requirements of ANSI/NSF 61.

Page 10-64, Article 1036-8 SLEEVES, COUPLINGS, AND MISCELLANEOUS, paragraph (B) Transition Sleeves and Couplings, add the following subsection:

(C) Breakaway Valve Markers

Valve markers shall be manufactured with durable polymer and shall be able to withstand vehicle impact at speeds of 65 miles per hour, and to flex so that any impact will not cause excessive damage to a vehicle upon impact. The post shall be configured in a half circle, with a 3.5-inch outside diameter, and shall have an integral metal U-channel for driving the post into all types of soils. The post shall be at least 48 inches long and shall be white in color with a blue pre-applied colored customized decal. The decal shall be UV and weather-resistant, colored blue with white lettering, and shall include the following information:

- Large lettering at the top of the decal showing the letters "VM" for valve marker, written in vertical configuration ("V" over "M");
- Valve number written as "Valve No. 120" (place valve number below the "VM" lettering
    - obtain specific valve number from Harnett Regional Water;
- Directional arrow pointed left or right as appropriate for the actual valve location in reference to the location of the post to be installed (place directional arrow below the valve number); and
- Distance to valve to the nearest foot (place just below the directional arrow).

Page 15-1, Article 1500-2 COOPERATION WITH THE UTILITY OWNER, paragraph 2, add the following paragraph:

Prior to construction, attend a pre-construction meeting with Harnett Regional Water and the utility construction engineer. Notify Mr. Chad Everette at least two (2) days prior to construction commencing. Coordinate with Mr. Chad Everette for regular inspection visitations and acceptance of the system. Upon construction completion coordinate with Harnett Regional Water for a final inspection and walkthrough.

Page 15-1, Article 1500-5 RELATION OF WATER MAINS TO SEWERS, lines 34-38, replace the article title and first paragraph with the following:

1500-5 RELATION OF WATER MAINS TO NON-POTABLE WATER LINES AND OTHER UTILITIES

For sanitary sewers, lay water mains at least 10 feet laterally from existing or proposed sanitary sewers. If local conditions or barriers prevent a 10 foot separation, lay the water main with at least

18 inches vertical separation above the top of the sanitary sewer pipe either in a separate trench or in the same trench on a bench of undisturbed earth.

Page 15-2, Article 1500-5 RELATION OF WATER MAINS TO SEWERS, lines 1-9, replace the second and third paragraph with the following:

For storm drain pipe, reclaimed water distribution or other utilities, lay the water main with at least 12 inches separation from the outside of the water main and the outside of the other facility.

One full length of water pipe at the point of crossing shall be located so that both joints will be as far from the sanitary sewer as possible. If practicable, the water main shall be located above the sewer.

For storm drain pipe, reclaimed water distribution or other utilities, lay the water main with at least 12 inches separation from the outside of the water main and the outside of the other facility.

One full length of water pipe at the point of crossing shall be located so that both joints will be as far from the sanitary sewer as possible. If practicable, the water main shall be located above the sewer.

Page 15-2, Article 1500-7 SUBMITTALS AND RECORDS, lines 22-23, replace the third sentence of the first paragraph with the following:

Provide 2 hard copies to the utility owner and an electronic (.pdf) copy to the Engineer and utility owner.

Page 15-2, Article 1500-7 SUBMITTALS AND RECORDS, lines 28-30, replace the second and third sentence of the third paragraph with the following:

The plans shall include notations of the size and type material installed, coordinates of utility controls and horizontal and vertical locations of the piping sealed by a North Carolina Professional Land Surveyor (PLS). As-built plans provided as PDF formatted files shall be generated from the source electronic files, not scanned facsimiles of paper plan sheets. Provide as-builts as PDF files to the Engineer. Provide hard copy as-builts to the utility owner for filing. These plans shall consist of four (2) 24" X 36" bond prints for all construction in place. These drawings must be sealed by the registered professional engineer with his signature and marked "Record" drawings. Any and all field change orders that were made during construction shall be properly documented in the "Record" Drawings. The "Record" Drawings shall include all lot numbers, water valves, valve markers, water meter setters, fire hydrants, blow off assemblies, manholes, sewer clean outs, air release valves, profiles and sewer lift stations as installed by the contractor. A digital copy of the "Record" Drawings must be submitted to HRW. Preferably, the digital copy of the "Record" Drawings should be produced in AutoCAD (.dwg) or (.dxf) format and one copy in PDF.

Page 15-2, Article 1500-8 LOCATING AND MARKING, add the following paragraph:

Locate the newly installed water main(s), water service lines and all associated meter setters and meter boxes for other utility companies and their contractors as requested by Harnett Regional Water until the new water main(s) have been approved by the North Carolina Department of Environment Quality – Division of Water Resources, Public Water Supply Section (NCDEQ-DWR, PWSS) and accepted by Harnett Regional Water.

Pages 15-6 to 15-7, Article 1510-3 CONSTRUCTION METHODS, paragraph (B)-Testing and Sterilization, add the following paragraph:

A Harnett Regional Water representative must witness all hydrostatic testing of installed water mains, valves, fittings, and appurtenances. All water sample collection for bacteria testing shall be witnessed by a representative of Harnett Regional Water.

Page 15-8, Article 1515-3 CONSTRUCTION METHODS, paragraph (B)-Meter, add the following paragraph:

The meter setters must be a minimum of 8" below the meter box lid. Meter setters shall be centered in the meter box and supported by brick, block or stone.

Meter setters shall be installed in pairs on every other lot line where possible to leave adequate space for other utilities to be installed at a later time. The meter setters shall be installed at least one (1') foot inside the right-of-way and at least three (3') to five (5') feet from the property line between the lots.

Meter boxes for ¾" services shall be 12" wide x 17" long ABS plastic boxes at least 18" in height with cast iron lids/covers. Meter boxes for 1" services shall be 17" wide x 21" long ABS plastic boxes at least 18" in height with plastic lids and cast iron flip covers in the center of the lids. Meter boxes for 2" services shall be 20" wide x 32" long ABS plastic boxes at least 20" in height with plastic lids and cast iron flip covers in the center of the lids.

Pages 15-8 to 15-9, Article 1515-3 CONSTRUCTION METHODS, paragraph (D)-Fire Hydrant, add the following paragraph:

All fire hydrant installations must be inspected by Harnett County Deputy Fire Marshal. Notify the Fire Marshall at (910) 893-7580 once the construction is complete to request a site inspection of all fire hydrant installations.

Page 15-9, Article 1515-3 CONSTRUCTION METHODS, paragraph (G) Miscellaneous Controls, add the following paragraph:

The breakaway valve marker shall be installed so that the outside edge of the post is facing the roadway. The u-channel part of the post assembly shall be driven into the ground so that the steel u-channel is 1-inch below the existing ground level, with the half-circle polymer post attached to the metal u-channel. The polymer post shall be at least 18-inches above grade after driving the u-channel.

PROJECT SPECIAL PROVISIONS

Utility by Others

KCI ASSOCIATES OF NC

ISO 9001:2015 CERTIFIED

ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

4505 Falls of Neuse Rd., Suite 400 • Raleigh, NC 27609 • Phone 919-783-9214 • Fax 919-783-9266

Prepared By: Daniel C. Allen • Phone: 919-278-2567 • Email: Daniel.Allen@KCI.com

General:

The following utility companies have facilities that will be in conflict with the construction of this project:

A. **Duke Energy – Power (Distribution)**
B. **Duke Energy – Power (Transmission)**
C. **Piedmont Natural Gas – Gas**
D. **Charter – Communications**
E. **CenturyLink – Communications**
F. **Conterra – Communications**
G. **Segra – 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 2018 Standard Specifications.

Utilities Requiring Adjustment:

Utility relocations are shown on the Utility by Others Plans. The utilities will phase their relocations by area. Completion dates for each utility in each area are given in the Utilities Relocation Phasing section of the Special Provisions.

A) Duke Energy – Power (Distribution)

Contact Information: Jonathan Hilfiker, 919-675-3125
Jonathan.Hilfiker@duke-energy.com
4721 Hargrove Rd, Raleigh, NC 27616

B) Duke Energy – Power (Transmission)

Contact Information: Jamie Loy, 919-546-6034
Jamie.Loy@duke-energy.com
4690 Simms Creek Rd, Raleigh, NC 27616

C) Piedmont Natural Gas – Gas

Contact Information: Jason Bingham, 919-222-8147
Jason.Bingham@duke-energy.com
250 Five Points Rd, Dudley, NC 28333

D) Charter – Communications

Contact Information: Robbie Bullard, 910-401-5010
Robbie.Bullard@charter.com
101 Innovation Ave, Morrisville, NC 27560

E) CenturyLink – Communications

Contact Information: Larry Shackelford, 910-528-5749
Larry.Shackelford@CenturyLink.com
143 N Washington St, Rocky Mount, NC 27801

F) Conterra – Communications

Contact Information: Mark Brooks, 704-936-1739
MBrooks@conterra.com
5301 77 Center Dr, Charlotte, NC 28217

G) Segra – Communications

Contact Information: Elizabeth Sweeney, 984-222-1048
Sweeneye@Lumosnet.com
1500 Hampton St, Columbia, SC 29201

Utilities Relocation Phasing:

Utility relocations will be constructed in the following areas:

Area 1:
-L- NC 55 from Sta. 10+50 to 114+50
-Y1- Oak Grove Church Road from Sta. 09+00 to -Y2- Guy Road Sta. 14+00
-Y3- SR 1538 (Mabry Road) from Sta. 11+00 to 13+75
-Y4- NC 55 Business from Sta. 12+50 to 26+75
-Y4A- Access Road 1 from Sta. 10+00 to 20+20
-Y4B- Access Road 2 from Sta. 10+00 to 17+12

Area 2:
-L- NC 55 from Sta. 114+50 to 146+00
-Y5- SR 1540 (Montague Road) from Sta. 16+00 to 22+62
-Y5A- SR 1543 (Ennis Road) from Sta. 10+00 to 20+00

Area 3:
-L- NC 55 from Sta. 164+50 to 174+00
-Y6- SR 1542 (Old Buies Creek Road) from Sta. 13+40 to 21+25
-Y6A- Gardner Road from Sta. 10+00 to 19+00

Area 4:
-L- NC 55 from Sta. 174+00 to 206+00

Area 5:
-Y7D- Matthews Mill Pond Road from Sta. 04+00 to -Y7C- Old Matthews Pond Road 24+60

Area 6:
-Y7- NC 210 from Sta. 15+50 to 39+00

Relocations in each area will proceed as outlined in the following sections:

Area 1 Schedule:
-L- NC 55 from Sta. 10+50 to 114+50
-Y1- Oak Grove Church Road from Sta. 09+00 to -Y2- Guy Road Sta. 14+00
-Y3- SR 1538 (Mabry Road) from Sta. 11+00 to 13+75
-Y4- NC 55 Business from Sta. 12+50 to 26+75
-Y4A- Access Road 1 from Sta. 10+00 to 20+20
-Y4B- Access Road 2 from Sta. 10+00 to 17+12

A) Duke Energy (Power Distribution)
Duke Energy's relocation work will be complete by November 1, 2023.

B) Charter (Communication)
Charter's relocation work will be complete by January 1, 2024.

C) CenturyLink (Communication)
CenturyLink's relocation work will be complete by January 1, 2024.

D) Segra (Communication)
Segra's relocation work will be complete by Date of Availability.

Area 2 Schedule:
-L- NC 55 from Sta. 114+50 to 146+00
-Y5- SR 1540 (Montague Road) from Sta. 16+00 to 22+62
-Y5A- SR 1543 (Ennis Road) from Sta. 10+00 to 20+00

A) Duke Energy (Power Distribution)
Duke Energy's relocation work will be complete by Date of Availability.

B) Charter (Communication)
Charter's relocation work will be complete by Date of Availability.

C) CenturyLink (Communication)
CenturyLink's relocation work will be complete by Date of Availability.

Area 3 Schedule:
-L- NC 55 from Sta. 164+50 to 174+00
-Y6- SR 1542 (Old Buies Creek Road) from Sta. 13+40 to 21+25
-Y6A- Gardner Road from Sta. 10+00 to 19+00

A) Duke Energy (Power Distribution)
Duke Energy's relocation work is completed.

B) Charter (Communication)
Charter's relocation work will be complete by Date of Availability

C) CenturyLink (Communication)
CenturyLink's relocation work will be complete by Date of Availability

Area 4 Schedule:
-L- NC 55 from Sta. 174+00 to 206+00

A) Duke Energy (Power Distribution)
Duke Energy's relocation work will be complete by Date of Availability

B) Duke Energy (Power Transmission)
Duke Energy's relocation work will be complete by Date of Availability

C) Charter (Communication)
Charter's relocation work will be complete by Date of Availability

D) CenturyLink (Communication)
CenturyLink's relocation work will be complete by Date of Availability.

Area 5 Schedule:
-Y7D- Matthews Mill Pond Road from Sta. 04+00 to -Y7C- Old Matthews Pond Road 24+60

A) Duke Energy (Power Distribution)
Duke Energy's relocation work is completed.

B) Charter (Communication)
Charter's relocation work is completed.

C) CenturyLink (Communication)
CenturyLink's relocation will be complete by Date of Availability

Area 6 Schedule:
-Y7- NC 210 from Sta. 15+50 to 39+00

A) Duke Energy (Power Distribution)
Duke Energy's relocation work is completed.

B) Piedmont Natural Gas (Gas)
Piedmont Natural Gas relocation work is completed.

C) Charter (Communication)
Charter's relocation work will be complete by Date of Availability.

D) CenturyLink (Communication)
CenturyLink's relocation work will be complete by Date of Availability.

E) Conterra (Communication)
Conterra's relocation work is completed.

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: (East)

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.

All Roadway Areas

March 1 - August 31		**September 1 - February 28**	
50#	Tall Fescue	50#	Tall Fescue
10#	Centipede	10#	Centipede
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Waste and Borrow Locations

March 1 – August 31		**September 1 - February 28**	
75#	Tall Fescue	75#	Tall Fescue
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Note: 50# of Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

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
Avenger	Falcon NG	Lexington	Silver Hawk
Barlexas	Falcon V	LSD	Sliverstar
Barlexas II	Faith	Magellan	Shenandoah Elite
Bar Fa	Fat Cat	Matador	Sidewinder
Barrera	Festnova	Millennium SRP	Skyline
Barrington	Fidelity	Monet	Solara
Barrobusto	Finelawn Elite	Mustang 4	Southern Choice II
Barvado	Finelawn Xpress	Ninja 2	Speedway
Biltmore	Finesse II	Ol' Glory	Spyder LS
Bingo	Firebird	Olympic Gold	Sunset Gold
Bizem	Firecracker LS	Padre	Taccoa
Blackwatch	Firenza	Patagonia	Tanzania
Blade Runner II	Five Point	Pedigree	Trio
Bonsai	Focus	Picasso	Tahoe II
Braveheart	Forte	Piedmont	Talladega
Bravo	Garrison	Plantation	Tarheel
Bullseye	Gazelle II	Proseeds 5301	Terrano
Cannavaro	Gold Medallion	Prospect	Titan ltd
Catalyst	Grande 3	Pure Gold	Titanium LS
Cayenne	Greenbrooks	Quest	Tracer
Cessane Rz	Greenkeeper	Raptor II	Traverse SRP
Chipper	Gremlin	Rebel Exeda	Tulsa Time
Cochise IV	Greystone	Rebel Sentry	Turbo
Constitution	Guardian 21	Rebel IV	Turbo RZ
Corgi	Guardian 41	Regiment II	Tuxedo RZ
Corona	Hemi	Regenerate	Ultimate
Coyote	Honky Tonk	Rendition	Venture
Darlington	Hot Rod	Rhambler 2 SRP	Umbrella
Davinci	Hunter	Rembrandt	Van Gogh
Desire	Inferno	Reunion	Watchdog
Dominion	Innovator	Riverside	Wolfpack II
Dynamic	Integrity	RNP	Xtremegreen
Dynasty	Jaguar 3	Rocket	
Endeavor	Jamboree	Scorpion	

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 5 pounds per acre and add 20# of Sericea Lespedeza from January 1 - December 31.

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 **(East)**

Native Grass Seeding and Mulching shall be performed on the disturbed areas of wetlands and riparian areas, and adjacent to Stream Relocation 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.

March 1 - August 31		**September 1 - February 28**	
18#	Creeping Red Fescue	18#	Creeping Red Fescue
6#	Indiangrass	6#	Indiangrass
8#	Little Bluestem	8#	Little Bluestem
4#	Switchgrass	4#	Switchgrass
25#	Browntop Millet	35#	Rye Grain
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*.

All areas seeded and mulched shall be tacked with asphalt. Crimping of straw in lieu of asphalt tack shall not be allowed on this project.

CRIMPING STRAW MULCH:

Crimping shall be required on this project adjacent to any section of roadway where traffic is to be maintained or allowed during construction. In areas within six feet of the edge of pavement, straw is to be applied and then crimped. After the crimping operation is complete, an additional application of straw shall be applied and immediately tacked with a sufficient amount of undiluted emulsified asphalt.

Straw mulch shall be of sufficient length and quality to withstand the crimping operation.

Crimping equipment including power source shall be subject to the approval of the Engineer providing that maximum spacing of crimper blades shall not exceed 8".

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. Sweet Sudan Grass, 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 on all roadway areas except slopes 2:1 and steeper shall be 10-20-20 grade and shall be applied at the rate of 500 pounds per acre. 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 10-20-20 analysis and as directed.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas 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*, with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The rate of application for supplemental seeding 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 4 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 ¾" 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	Pay Unit
Response for Erosion Control	Each

ENVIRONMENTALLY SENSITIVE AREAS:

Description

This project is located in an *Environmentally Sensitive Area*. This designation requires special procedures to be used for clearing and grubbing, temporary stream crossings, and grading operations within the Environmentally Sensitive Areas identified on the plans and as designated by the Engineer. This also requires special procedures to be used for seeding and mulching and staged seeding within the project.

The Environmentally Sensitive Area shall be defined as a 50-foot buffer zone on both sides of the stream or depression measured from top of streambank or center of depression.

Construction Methods

(A) Clearing and Grubbing

In areas identified as Environmentally Sensitive Areas, the Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations as described in Article 200-1 of the *Standard Specifications*. Only clearing operations (not grubbing) shall be allowed in this buffer zone until immediately prior to beginning grading operations. Erosion control devices shall be installed immediately following the clearing operation.

(B) Grading

Once grading operations begin in identified Environmentally Sensitive Areas, work shall progress in a continuous manner until complete. All construction within these areas shall

progress in a continuous manner such that each phase is complete and areas are permanently stabilized prior to beginning of next phase. Failure on the part of the Contractor to complete any phase of construction in a continuous manner in Environmentally Sensitive Areas will be just cause for the Engineer to direct the suspension of work in accordance with Article 108-7 of the *Standard Specifications*.

(C) Temporary Stream Crossings

Any crossing of streams within the limits of this project shall be accomplished in accordance with the requirements of Subarticle 107-12 of the *Standard Specifications*.

(D) Seeding and Mulching

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.

Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment. No appreciable time shall lapse into the contract time without stabilization of slopes, ditches and other areas within the Environmentally Sensitive Areas.

(E) Stage Seeding

The work covered by this section shall consist of the establishment of a vegetative cover on cut and fill slopes as grading progresses. Seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 feet in height measured along the slope, or greater than 2 acres in area. Each stage shall not exceed the limits stated above.

Additional payments will not be made for the requirements of this section, as the cost for this work shall be included in the contract unit prices for the work involved.

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. 04-27-20)

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:

https://files.nc.gov/ncdeq/Water+Quality/Environmental+Sciences/ATU/PAM8_30_18.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:
(2-16-11) (Rev. 3-17-22)

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:

https://connect.ncdot.gov/resources/roadside/FieldOperationsDocuments/Contract%20Reclamation%20Procedures.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

Item	Section
Geotextile for Soil Stabilization, Type 4	1056

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 Item	Pay Unit
Safety Fence	Linear Foot

<u>SKIMMER BASIN WITH BAFFLES</u>: **(East)**

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.

The geotextile for the spillway liner shall meet the following minimum physical properties for low permeability, woven polypropylene geotextiles:

Property	**Test Method**	**Value**	**Unit**
Tensile Strength	ASTM D-4632	315	lb.
Tensile Elongation (Maximum)	ASTM D-4632	15	%
Trapezoidal Tear	ASTM D-4533	120	lbs.
CBR Puncture	ASTM D-6241	900	lbs.
UV Resistance (% retained at 500 hrs.)	ASTM D-4355	70	%
Apparent Opening Size (AOS)	ASTM D-4751	40	US Std. Sieve
Permittivity	ASTM D-4491	0.05	sec^{-1}
Water Flow Rate	ASTM D-4491	4	$gal/min/ft^2$

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 Type 4 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 low permeability polypropylene 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*.

Low Permeability Geotextile will be measured and paid for as the actual number of square yards measured along the surface of the spillway over which the geotextile is installed and accepted.

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
Low Permeability Geotextile	Square Yard

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/ft^3 +/- 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 Item	**Pay Unit**
Polyacrylamide(PAM)	Pound
Coir Fiber Wattle	Linear Foot

SILT FENCE COIR FIBER WATTLE BREAK:
(8-21-12) 1605,1630

Description

Silt fence coir fiber wattle breaks are tubular products consisting of coir fibers (coconut fibers) encased in coir fiber netting and used in conjunction with temporary silt fence at the toe of fills to intercept runoff. Silt fence coir fiber wattle breaks 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 Silt fence coir fiber wattle breaks.

Materials

Coir fiber wattle shall meet the following specifications:

100% Coir (Coconut) Fibers	
Minimum Diameter	12"
Minimum Length	10 ft
Minimum Density	3.5 lb/cf ± 10%
Net Material	Coir Fiber
Net Openings	2" x 2"
Net Strength	90 lb.
Minimum Weight	2.6 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

Excavate a trench the entire length of each wattle with a depth of 1" to 2" for the wattle to be placed. Secure silt fence coir fiber wattle breaks 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 silt fence coir fiber wattle break 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.

Install temporary silt fence in accordance with Section 1605 of the *Standard Specifications* and overlap each downslope side of silt fence wattle break by 6".

Maintain the silt fence coir fiber wattle breaks until the project is accepted or until the silt fence coir fiber wattle breaks are removed, and remove and dispose of silt accumulations at the silt fence coir fiber wattle breaks when so directed in accordance with Section 1630 of the *Standard Specifications*.

Measurement and Payment

Coir Fiber Wattle 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 silt fence coir fiber wattle break.

Payment will be made under:

Pay Item	**Pay Unit**
Coir Fiber Wattle	Linear 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	Pay Unit
Polyacrylamide(PAM)	Pound

BORROW PIT DEWATERING BASIN:
(3-17-09) (Rev 3-2-11)

Description

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.

Construct, maintain and remove earth embankments used to reduce turbidity from dewatering borrow sites. Work includes providing porous coir fiber baffle, filtration geotextile, stone and outlet structures; cleaning out, maintaining, removing and disposing of the borrow pit dewatering basin and all components; and reshaping, dressing, seeding and mulching the area.

Materials

Refer to Division 10

Item	Section
Riprap, Class A, B, 1, and 2	1042
Geotextile for Drainage, Type 2	1056
Coir Fiber Baffle	1640-2

Use suitable excavated materials, as specified in Sections 225, 230 and 240 of the *Standard Specifications* in the construction of earth embankments for borrow pit dewatering basins, except where otherwise specified.

Construction Methods

Construct borrow pit dewatering basins according to the detail in the erosion control plans, and at locations shown on Reclamation Plans or in areas as directed.

The volume of the borrow pit dewatering basin will be based on a 2 hour retention time. The pump rate shall not exceed 1,000 GPM. The Contractor, at his option, may use a greater retention time for managing turbidity.

The straight line distance between the inlet and outlet shall be divided to include a forebay chamber in the upper quarter cell. Install one porous coir fiber baffle across the full width of the basin to

delineate the forebay chamber. Do not use earthen or rock baffle. Install filtration geotextile on the interior side slopes and the floor of the forebay.

The water pumped from the borrow pit into the dewatering basin shall be obtained from the top of the water column and shall be discharged into the forebay in a non-erodible manner.

The borrow pit dewatering basin outlet shall be a vertical non-perforated riser pipe or flash board riser attached with a watertight connection to a barrel that carries the water through the embankment.

Maintenance and Removal

Maintain the borrow pit dewatering basin, coir fiber baffle, and remove and dispose of silt accumulations in accordance with Article 1630-3 of the *Standard Specifications*. The Contractor may include a drain device for maintenance and removal at his discretion.

Remove the borrow pit dewatering basin once dewatering operations are completed. Grade, seed, and mulch the area after removal of the borrow pit dewatering basin in accordance with Section 1660 of the *Standard Specifications*. The area shall be stabilized with an approved groundcover before final acceptance of the site.

Measurement and Payment

No direct payment will be made for borrow pit dewatering basins with the exception of the work of silt removal during dewatering basin operation and the work of seeding and mulching after removal of the dewatering basin. All other work and materials required for installation, maintenance and removal of borrow pit dewatering basins shall be incidental to *Borrow Excavation*. Such price and payments will be full compensation for the work of constructing, maintaining and removing the borrow pit dewatering basin including, but not limited to, the construction and removal of the borrow pit dewatering basin; furnishing of the outlet structure, baffle, filtration geotextile, stone and optional drain devices; and removal of all such items once dewatering operations are completed.

Removal and disposal of silt accumulations during dewatering operations will be measured and paid at the contract unit price per cubic yard for *Silt Excavation* in accordance with Article 1630-4 of the *Standard Specifications.*

Grading, seeding, and mulching the area after removal of the borrow pit dewatering basin will be measured and paid at the contract unit price per acre for *Seeding and Mulching* in accordance with Section 1660-8 of the *Standard Specifications*.

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

Item	Section
Geotextile for Soil Stabilization, Type 4	1056

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:
(9-9-11)(Rev. 11-15-22)

Description

This work consists of furnishing, installing, maintaining, pumping 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 by the Engineer.

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.

Construction Methods

Where impervious dikes are shown on the plans and used to dewater or lower the water elevation, construct in accordance with Article 410-4 and 410-5.

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 by the Engineer. Such price and payment will be full compensation for all work including but not limited to furnishing materials, construction, maintenance, pumping 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

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

Item	Section
Coir Fiber Mat	1060-14

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	**Pay Unit**
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

Item	Section
Temporary Silt Fence	1605

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:

https://connect.ncdot.gov/resources/roadside/SoilWaterDocuments/ConcreteWashoutStructuredetail.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

LITTER REMOVAL (MOWING AREAS ONLY):
(07-19-22)

Description

This work consists of the pickup, removal, and disposal of litter from roadsides within the construction project prior to mowing operations.

Construction Methods

Provide labor, equipment and materials necessary for the pickup and removal of litter from non-construction sources and the disposal of same into state approved landfills. The Contractor shall

abide by all ordinances, laws and regulations regarding disposal of litter and recycling of eligible materials. Wastes generated from construction activities shall be managed as provided elsewhere in the contract. Litter items may consist of any item not considered normal to the right-of-way, including but not limited to, varied sizes of bottles, cans, paper, tires, tire pieces, lumber, vehicle parts, building supplies, metals, household furnishings, cardboard, plastics, ladders, brush and other items not considered normal to the right of way. Litter removal shall be performed in designated areas within five days prior to any mowing operations and as directed. Designated areas shall include vegetated medians and shoulders within the project limits including all interchange ramps and other areas to be mown. Designated areas may be omitted for litter removal by the Engineer due to safety concerns.

The Contractor shall provide adequate personnel and materials to collect and remove litter. The Contractor shall be responsible for locating and utilizing approved local landfills and recycling facilities. Refer to Section 105-27 of the *Standard Specifications* for potential hazardous materials. All collected litter shall be containerized immediately and kept off the traveled portions of the roadway, shoulders, and rights-of-way (including paved shoulders). All collected litter that is small enough to be placed in a bag shall be bagged immediately. All collected litter that is too large for a bag shall be placed into a vehicle. Extended storage or stockpiling of collected litter and recyclables will not be permitted.

The Contractor's personnel shall dispose of any litter in a landfill approved by North Carolina Division of Waste Management. The Contractor will not be allowed to use NCDOT accounts at the landfills/recycling centers nor be allowed to dispose of the litter in NCDOT trash containers on any NCDOT property.

The Contractor shall report online the number of bags of litter and any recycling on the NCDOT Litter Management Website on the date of the pickup at the following website:

https://apps.ncdot.gov/LM

An access code ('Pickup Key') for the online reporting portal may be obtained via emailing the Roadside Environmental Unit Litter Management Section at ncdot.clr@ncdot.gov. The Contractor shall request access to the litter removal reporting website prior to starting initial litter collection operations.

Measurement and Payment

The quantity of litter removal to be performed will be affected by the actual conditions that occur during construction of the project. The quantity of litter removal 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.

Manual Litter Removal will be measured and paid as the actual number of man hours each worker spends picking up litter. Such price and payment will be full compensation for all litter removal work covered by *Litter Removal*, including, but not limited to, furnishing all materials, labor, equipment, transport, reporting, and incidentals necessary to accomplish the work.

Litter Disposal will be measured and paid for by the actual number of tons of litter collected and properly disposed of at a state approved landfill. Such price and payment will be full compensation for all fees, labor, transport, and incidentals necessary to dispose of collected litter associated with *Litter Removal*.

All traffic control necessary to provide a safe work area for *Litter Removal* shall be paid for as specified elsewhere in the contract.

Payment will be made under:

Pay Item	**Pay Unit**
Manual Litter Removal	MHR
Litter Disposal	TON

TACK FOR MULCH FOR EROSION CONTROL:
(07-19-22)

Description

This work consists of supplying and installing of an approved material for binding mulch for erosion control in accordance with Section 1060-5, Section 1615 and Section 1660 of the *Standard Specifications*. This provision defines acceptable materials and rates for tacking material for holding mulch in place.

Materials

(a) Emulsified Asphalt

Asphalt emulsion tack shall conform to the requirements of AASHTO M 140, Specification for Emulsified Asphalt. The emulsified asphalt may be rapid setting, medium setting, or slow setting. Apply emulsified asphalt tackifier at a rate of 0.10 gallons per square yard (approximately 484 gallons per acre).

(b) Cellulose Hydromulch

Cellulose hydromulch products shall be non-toxic, weed-free, prepackaged cellulose fiber (pulp) material containing no more than 3% ash or other inert materials. Cellulose hydromulches may contain dyes or binders specifically formulated to enhance the adhesive qualities of the hydromulch. Apply cellulose hydromulches at a rate of 1000 pounds (dry weight) per acre.

Wood fiber or wood fiber blend hydromulches may be substituted for cellulose hydromulch at the same application rate.

(c) Other tackifiers

Other approved materials, specifically designed and manufactured for application as a straw mulch tacking agent, may be used at the manufacturer's recommended rate.

Construction Methods

Apply the Tack for Mulch for Erosion Control uniformly across straw mulch per Section 1615 and Section 1660 of the *Standard Specifications*.

Payment

Tack for Mulch for Erosion Control is incidental to the application of *Temporary Mulching*, Section 1615-4, and *Seeding and Mulching*, Section 1660-8, and no additional payment will be made.

POND DRAINAGE PLAN REQUIREMENT:

The Contractor shall develop a Pond Drainage Plan for all ponds that are required to be drained for the construction of this project and submit the plan to the Engineer at the preconstruction conference for approval. The Pond Drainage Plan shall include but not be limited to procedures and rate of water drawdown, sediment control measures, water quality monitoring, fish and wildlife relocation plan, shall address procedures avoiding the inundation of a receiving body of water with deoxygenated or nutrient rich water resulting in impacts to aquatic life or algae bloom and procedures for maintaining downstream channel stability. If such ponds to be drained are on the NC DEQ Dam Safety Inventory List, all NC DEQ Dam Safety procedures must be followed.

Any erosion control devices or permanent seeding and mulching in areas where ponds have been drained will be paid for at the contract unit price for the item required. All additional erosion and sediment control practices not included in the contract documents that may be required on a pond drainage site will be done at the Contractor's expense.

No direct payment will be made for developing or implementing the Pond Drainage Plan as the cost of such shall be included in the lump sum price bid for *Clearing and Grubbing*.

NORTH CAROLINA PROFESSIONAL SEAL 044434 ENGINEER KEVIN P. BAUMANN

DocuSigned by: 1/17/2023

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Document not considered final unless all signatures completed.

Signals and Intelligent Transportation Systems
Project Special Provisions
(Version 18.6)

Prepared By: CFD/KPB
17-Jan-23

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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 16-inch pedestrian signal head housings and end caps from die-cast aluminum. 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:

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,

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 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 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 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°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. 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
12-inch green circular	15	15

For yellow circular 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 for the 12-inch circular module.

Note: Use a wattmeter having an accuracy of ±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 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 ±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 ±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. 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
- 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 – 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 185° F	150 VAC (RMS) 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

3.2. 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.

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° 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:

Peak Surge Current (6 times, 8x20µs)
(Differential Mode)……400A
(Common Mode)……1,000A
Occurrences (8x20µs waveform)……..500 min @ 200A
Maximum Clamp Voltage
(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

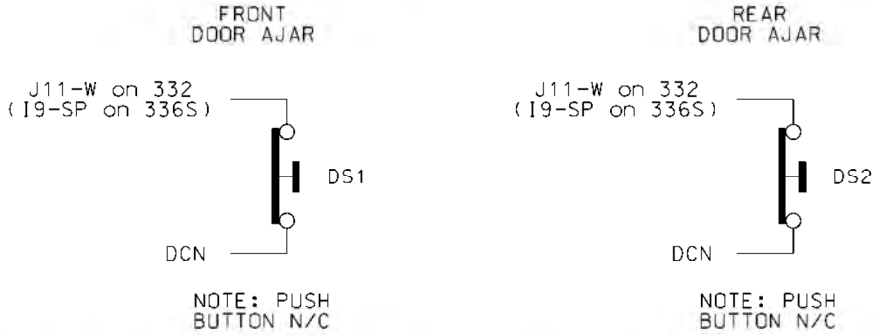
Provide a 120 VAC signal surge suppressor for each AC+ interconnect signal input. Ensure the device meets the following specifications:

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

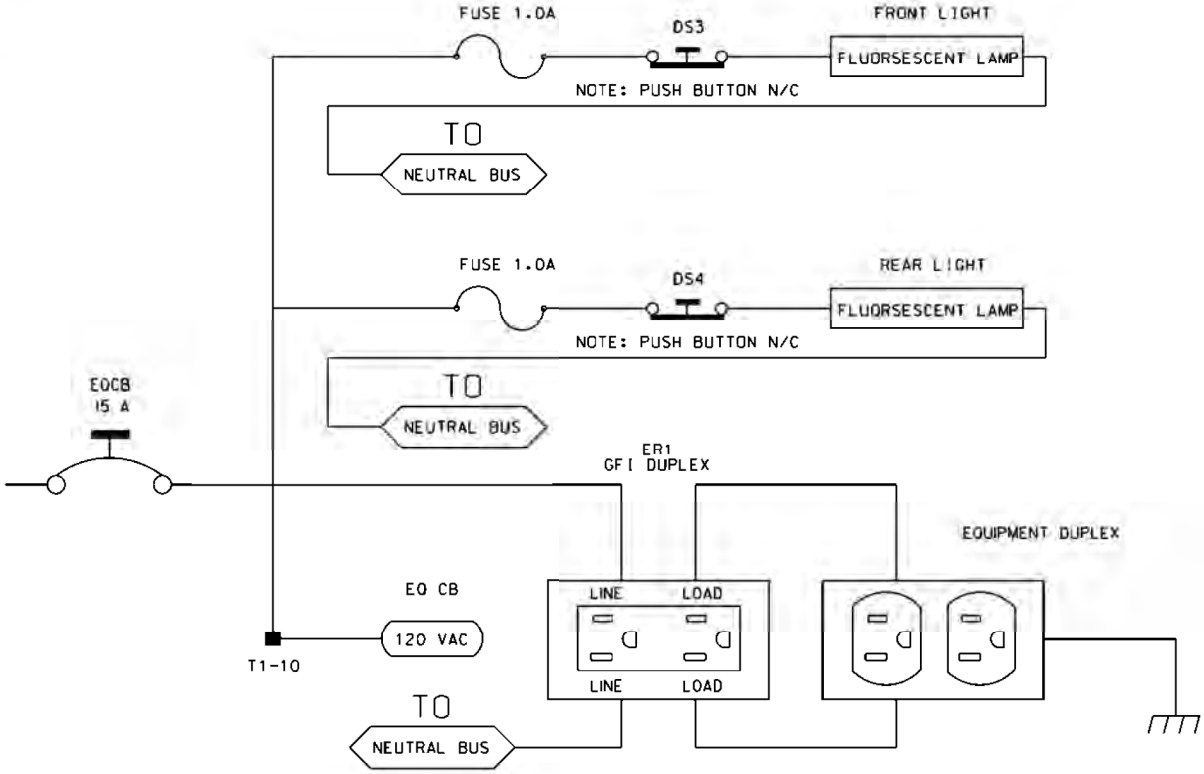
Provide conductors for surge protection wiring that are of sufficient size (ampacity) to withstand maximum overcurrents which could occur before protective device thresholds are attained and current flow is interrupted.

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.

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).



Furnish a police panel with a police panel 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.

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:

332 Cabinet	
Detector Call Switches	**Terminals**
Phase 1	I1-W
Phase 2	I4-W
Phase 3	I5-W
Phase 4	I8-W
Phase 5	J1-W
Phase 6	J4-W
Phase 7	J5-W
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.

	P1		P2		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.

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.

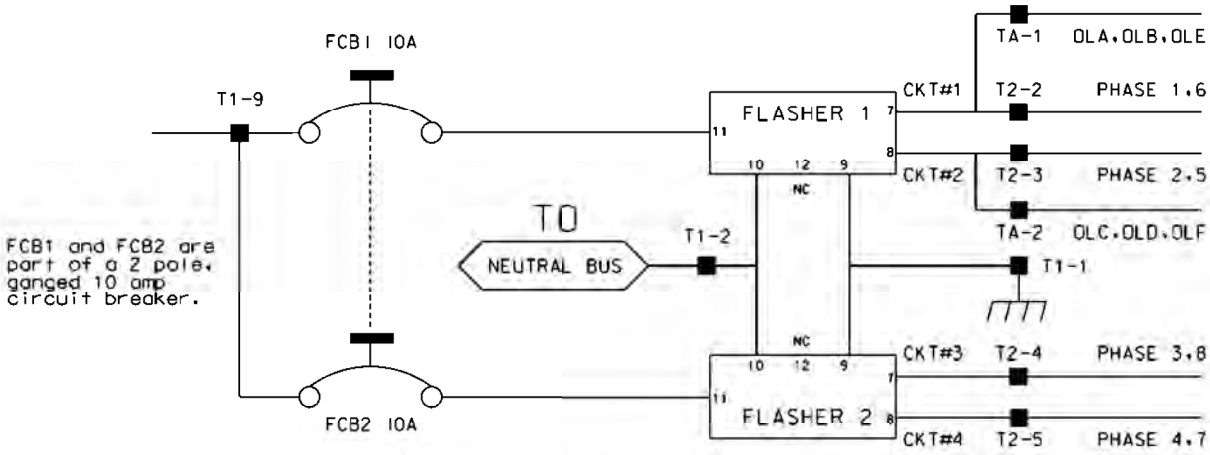
	P20 Connector				
PIN	FUNCTION	CONN TO	PIN	FUNCTION	CONN TO
1	Channel 15 Red	119	2	Channel 16 Red	110
3	Channel 14 Red	104	4	Chassis GND	01-9
5	Channel 13 Red	113	6	N/C	
7	Channel 12 Red	AUX 101	8	Spec Function 1	
9	Channel 10 Red	AUX 124	10	Channel 11 Red	AUX 114
11	Channel 9 Red	AUX 121	12	Channel 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.



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)

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 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.

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)

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).

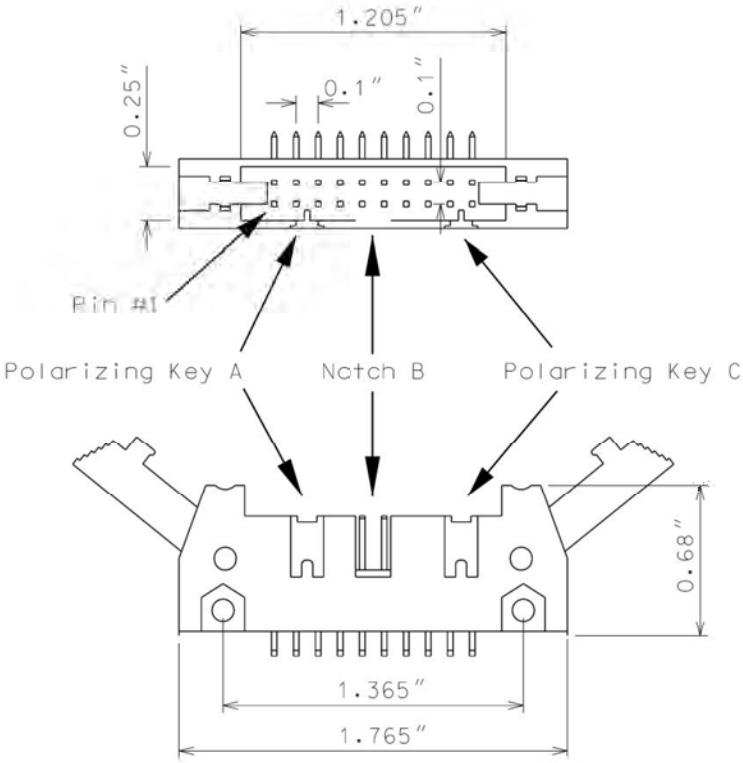
Provide a switch to set the Watchdog fault timing. Ensure that when the switch is in the ON position the Watchdog fault timing value is set to 1.0 +/- 0.1 s (2018 mode). Ensure that when the switch is in the OFF position the Watchdog fault timing value is set to 1.5 +/- 0.1 s (210 mode).

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 +/- 2 Vrms, the AC line restore voltage threshold is 103 +/- 2 Vrms, and the AC line brown-out timing value is set to 400 +/- 50ms (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 +/- 2 Vrms, the AC line restore voltage threshold is 98 +/- 2 Vrms, and the AC line brown-out timing value is set to 80 +/- 17 ms (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.



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

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 ± 0.1-second accuracy). If a channel fails to detect an "on" signal at the Yellow input for a minimum of 2.7 seconds (± 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

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 Hz ± 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 ± 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

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).

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

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	O
2	TX Data	O
3	RX Data	I
4	DTR	I
5	Ground	-
6	DSR	O
7	CTS	I
8	RTS	O
9	NC	-

MONITOR BOARD EDGE CONNECTOR

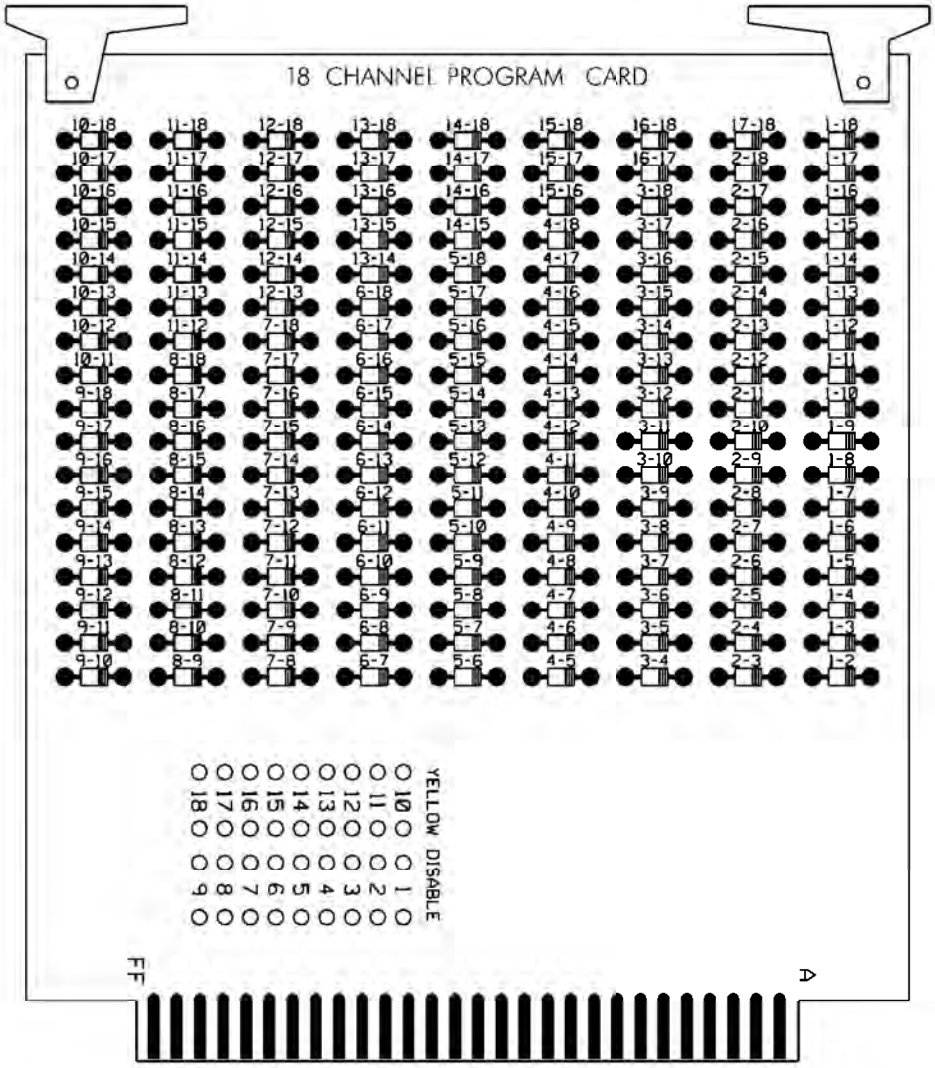
Pin #	Function (Back Side)	Pin #	Function (Component Side)
1	Channel 2 Green	A	Channel 2 Yellow
2	Channel 13 Green	B	Channel 6 Green
3	Channel 6 Yellow	C	Channel 15 Green
4	Channel 4 Green	D	Channel 4 Yellow
5	Channel 14 Green	E	Channel 8 Green
6	Channel 8 Yellow	F	Channel 16 Green
7	Channel 5 Green	H	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

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	B	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	H	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



3.1. 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.

3.2. MATERIALS – TYPE 2070LX CONTROLLERS

Furnish model 2070LX 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 2070LX controllers with Linux kernel 2.6.18 or higher and device drivers, composed of the unit chassis and at a minimum the following modules and assemblies:

- MODEL 2070-1C, CPU Module, Single Board, with 8Mb Datakey (blue in color)

- MODEL 2070-2E+, Field I/O Module (FI/O)
  - Note: Configure the Field I/O Module to disable both the External WDT Shunt/Toggle Switch and SP3 (SP3 active indicator is "off")
- MODEL 2070-3B, Front Panel Module (FP), Display B (8x40)
- MODEL 2070-4A, Power Supply Module, 10 AMP

Provide a Board Support Package (BSP) to the state and to any specified applications software manufacturer when requested by the state to facilitate the porting of application software.

4. METAL POLE SUPPORTS

4.1. 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 detail drawing only, 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 unique drawing number 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 unique drawing number 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.

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 572 Gr 55 or 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 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.

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 and MVD 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.

- All CCTV and MVD poles shall meet the compact section limits per section 5.5.2 along with Table 5.5.2-1. Minimum thickness of CCTV and MVD pole shafts shall be ¼-inch.
- All CCTV and MVD poles shall use full-penetration groove weld tube-to-transverse plate connection with backing ring. Refer to Metal Pole Standard Drawing Sheet M9 for details. Fillet-welded tube-to-transverse-plate connections are not permitted.

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 ft^2
- 4-section, 12-inch, Surface area: 32.0 ft^2
- 5-section, 12-inch, Surface area: 42.0 ft^2

Design a base plate for each pole. The minimum base plate thickness for all poles is determined by the following criteria:

Case 1 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.

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.

Case 2 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 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, 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 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 Galvanizing ..... Article 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.

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.

4.2. 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.

All CCTV and MVD pole drilled shafts shall be a minimum of 4'-0" diameter. Refer to Standard Drawing Nos. M7 and M8.

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 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:

$$N_{AVG} = \frac{N_{@1'} + N_{@2.5'} + \cdots + N_{@Deepest\ Boring\ Depth}}{Total\ Number\ of\ N\ values}$$

$$Y = (N_{@1'})^2 + (N_{@2.5'})^2 + \cdots + (N_{@Deepest\ Boring\ Depth})^2$$

$$Z = N_{@1'} + N_{@2.5'} + \cdots + N_{@Deeepest\ Boring\ Depth}$$

$$N_{STD\ DEV} = \sqrt{\left(\frac{(Total\ Number\ of\ N\ values\ \times Y) - Z^2}{(Total\ Number\ of\ N\ values) \times (Total\ Number\ of\ N\ values - 1)}\right)}$$

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:

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

4.3. 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."

4.4. MEASUREMENT AND PAYMENT

Actual number of metal poles with single mast arms furnished, installed, and accepted.

Actual number of designs for mast arms with metal poles furnished and accepted.

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 , CCTV or MVD support structures.

Payment will be made under:

Metal Pole with Single Mast Arm ..... Each

Mast Arm with Metal Pole Design ..... Each

Soil Test ..... Each

Drilled Pier Foundation ..... Cubic Yard

5. ETHERNET EDGE SWITCH

Furnish and install a managed Ethernet edge switch as specified below that is fully compatible, interoperable, and completely interchangeable and functional within the existing City or Division traffic signal system communications network.

5.1. DESCRIPTION

A. Ethernet Edge Switch:

Furnish and install a hardened, field Ethernet edge switch (hereafter "edge switch") for traffic signal controllers as specified below. Ensure that the edge switch provides wire-speed, fast Ethernet connectivity at transmission rates of 100 megabits per second from each remote ITS device location to the routing switches.

Contact the City or Division to arrange for the programming of the new Field Ethernet Switches with the necessary network configuration data, including but not limited to, the Project IP Address, Default Gateway, Subnet Mask and VLAN ID information. Provide a minimum five (5) days working notice to allow the City or Division to program the new devices.

B. Network Management:

Ensure that the edge switch is fully compatible with the City's or Division's existing Network Management Software.

5.2. MATERIALS

A. General:

Ensure that the edge switch is fully compatible and interoperable with the trunk Ethernet network interface and that the edge switch supports half and full duplex Ethernet communications.

Furnish an edge switch that provide 99.999% error-free operation, and that complies with the Electronic Industries Alliance (EIA) Ethernet data communication requirements using single-mode fiber-optic transmission medium and copper transmission medium. Ensure that the edge switch has a minimum mean time between failures (MTBF) of 10 years, or 87,600 hours, as calculated using the Bellcore/Telcordia SR-332 standard for reliability prediction.

B. Compatibility Acceptance

The Engineer has the authority to require the Contractor to submit a sample Field Ethernet Switch and Field Ethernet Transceiver along with all supporting documentation, software and testing procedures to allow a compatibility acceptance test be performed prior to approving the proposed Field Ethernet Switch and Field Ethernet Transceiver for deployment**. The Compatibility Acceptance testing will ensure that the proposed device is 100% compatible and interoperable with the existing City Signal System network, monitoring software and Traffic Operations Center network hardware.** Allow fifteen (15) working days for the Compatibility Acceptance Testing to be performed

C. Standards:

Ensure that the edge switch complies with all applicable IEEE networking standards for Ethernet communications, including but not limited to:

- IEEE 802.1D standard for media access control (MAC) bridges used with the Spanning Tree Protocol (STP);
- IEEE 802.1Q standard for port-based virtual local area networks (VLANs);
- IEEE 802.1P standard for Quality of Service (QoS);

- IEEE 802.1w standard for MAC bridges used with the Rapid Spanning Tree Protocol (RSTP);
- IEEE 802.1s standard for MAC bridges used with the Multiple Spanning Tree Protocol;
- IEEE 802.1x standard for port based network access control, including RADIUS;
- IEEE 802.3 standard for local area network (LAN) and metropolitan area network (MAN) access and physical layer specifications;
- IEEE 802.3u supplement standard regarding 100 Base TX/100 Base FX;
- IEEE 802.3x standard regarding flow control with full duplex operation; and
- IFC 2236 regarding IGMP v2 compliance.
- IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
- IEEE 802.3ad Ethernet Link Aggregation
- IEEE 802.3i for 10BASE-T (10 Mbit/s over Fiber-Optic)
- IEEE 802.3ab for 1000BASE-T (1Gbit/s over Ethernet)
- IEEE 802.3z for 1000BASE-X (1 Gbit/s Ethernet over Fiber-Optic)

D. Functional:

Ensure that the edge switch supports all Layer 2 management features and certain Layer 3 features related to multicast data transmission and routing. These features shall include, but not be limited to:

- An STP healing/convergence rate that meets or exceeds specifications published in the IEEE 802.1D standard.
- An RSTP healing/convergence rate that meets or exceeds specifications published in the IEEE 802.1w standard.
- An Ethernet edge switch that is a port-based VLAN and supports VLAN tagging that meets or exceeds specifications as published in the IEEE 802.1Q standard, and has a minimum 4-kilobit VLAN address table (254 simultaneous).
- A forwarding/filtering rate that is a minimum of 14,880 packets per second for 10 megabits per second and 148,800 packets per second for 100 megabits per second.
- A minimum 4-kilobit MAC address table.
- Support of Traffic Class Expediting and Dynamic Multicast Filtering.
- Support of, at a minimum, snooping of Version 2 & 3 of the Internet Group Management Protocol (IGMP).
- Support of remote and local setup and management via telnet or secure Web-based GUI and command line interfaces.
- Support of the Simple Network Management Protocol version 3 (SNMPv3). Verify that the Ethernet edge switch can be accessed using the resident EIA-232 management port, a telecommunication network, or the Trivial File Transfer Protocol (TFTP).
- Port security through controlling access by the users. Ensure that the Ethernet edge switch has the capability to generate an alarm and shut down ports when an unauthorized user accesses the network.
- Support of remote monitoring (RMON-1 & RMON-2) of the Ethernet agent.
- Support of the TFTP and SNTP. Ensure that the Ethernet edge switch supports port mirroring for troubleshooting purposes when combined with a network analyzer.

E. Physical Features:

Ports: Provide 10/100/1000 Mbps auto-negotiating ports (RJ-45) copper Fast Ethernet ports for all edge switches. Provide auto-negotiation circuitry that will automatically negotiate the highest possible data rate and duplex operation possible with attached devices supporting the IEEE 802.3 Clause 28 auto-negotiation standard.

Optical Ports: Ensure that all fiber-optic link ports operate at 1310 or 1550 nanometers in single mode. Provide Type LC connectors for the optical ports, as specified in the Plans or by the Engineer. Do not use mechanical transfer registered jack (MTRJ) type connectors.

Provide an edge switch having a minimum of two optical 100/1000 Base X ports capable of transmitting data at 100/1000 megabits per second. Ensure that each optical port consists of a pair of fibers; one fiber will transmit (TX) data and one fiber will receive (RX) data. Ensure that the optical ports have an optical power budget of at least 15 dB.

Copper Ports: Provide an edge switch that includes a minimum of four copper ports. Provide Type RJ-45 copper ports and that auto-negotiate speed (i.e., 10/100/1000 Base) and duplex (i.e., full or half). Ensure that all 10/100/1000 Base TX ports meet the specifications detailed in this section and are compliant with the IEEE 802.3 standard pinouts. Ensure that all Category 5E unshielded twisted pair/shielded twisted pair network cables are compliant with the EIA/TIA-568-B standard.

Port Security: Ensure that the edge switch supports/complies with the following (remotely) minimum requirements:

- Ability to configure static MAC addresses access;
- Ability to disable automatic address learning per ports; know hereafter as Secure Port. Secure Ports only forward; and
- Trap and alarm upon any unauthorized MAC address and shutdown for programmable duration. Port shutdown requires administrator to manually reset the port before communications are allowed.

F. Management Capabilities:

Ensure that the edge switch supports all Layer 2 management features and certain Layer 3 features related to multicast data transmission and routing. These features shall include, but not be limited to:

- An STP healing/convergence rate that meets or exceeds specifications published in the IEEE 802.1 D standards;
- An RSTP healing/convergence rate that meets or exceeds specifications published in the IEEE 802.1w standard;
- An Ethernet edge switch that is a port-based VLAN and supports VLAN tagging that meets or exceeds specifications as published in the IEEE 802.1Q standard, and has a minimum 4-kilobit VLAN address table (254 simultaneous);
- A forwarding/filtering rate that is a minimum of 14,880 packets per second for 10 megabits per second, 148,800 packets per second for 100 megabits per second and 1,488,000 packets per second for 1000 megabits per second;
- A minimum 4-kilobit MAC address table;
- Support of Traffic Class Expediting and Dynamic Multicast Filtering.
- Support of, at a minimum, snooping of Version 2 & 3 of the Internet Group Management Protocol (IGMP);

- Support of remote and local setup and management via telnet or secure Web-based GUI and command line interfaces; and
- Support of the Simple Network Management Protocol (SNMP). Verify that the Ethernet edge switch can be accessed using the resident EIA-232 management port, a telecommunication network, or the Trivial File Transfer Protocol (TFTP).

Network Capabilities: Provide an edge switch that supports/complies with the following minimum requirements:

- Provide full implementation of IGMPv2 snooping (RFC 2236);
- Provide full implementation of SNMPv1, SNMPv2c, and/or SNMPv3;
- Provide support for the following RMON–I groups, at a minimum:
  - Part 1: Statistics
  - Part 2: History
  - Part 3: Alarm
  - Part 9: Event
- Provide support for the following RMON–2 groups, at a minimum:
  - Part 13: Address Map
  - Part 16: Layer Host
  - Part 17:Layer Matrix
  - Part 18:User History
- Capable of mirroring any port to any other port within the switch;
- Meet the IEEE 802.1Q (VLAN) standard per port for up to four VLANs;
- Meet the IEEE 802.3ad (Port Trunking) standard for a minimum of two groups of four ports;
- Password manageable;
- Telnet/CLI;
- HTTP (Embedded Web Server) with Secure Sockets Layer (SSL); and
- Full implementation of RFC 783 (TFTP) to allow remote firmware upgrades.

Network Security: Provide an edge switch that supports/complies with the following (remotely) minimum network security requirements:

- Multi-level user passwords;
- RADIUS centralized password management (IEEE 802.1X);
- SNMPv3 encrypted authentication and access security;
- Port security through controlling access by the users: ensure that the Ethernet edge switch has the capability to generate an alarm and shut down ports when an unauthorized user accesses the network;
- Support of remote monitoring (RMON-1&2) of the Ethernet agent; and
- Support of the TFTP and SNTP. Ensure that the Ethernet edge switch supports port mirroring for troubleshooting purposes when combined with a network analyzer.

G. Electrical Specifications:

Ensure that the edge switch operates and power is supplied with 115 volts of alternating current (VAC). Ensure that the edge switch has a minimum operating input of 110 VAC and a maximum operating input of 130 VAC. Ensure that if the device requires operating voltages other than 120 VAC, supply the required voltage converter. Ensure that the maximum power consumption does not exceed 50 watts. Ensure that the edge switch has diagnostic light emitting diodes (LEDs), including link, TX, RX, speed (for Category 5E ports only), and power LEDs.

H. Environmental Specifications:

Ensure that the edge switch performs all of the required functions during and after being subjected to an ambient operating temperature range of -30 degrees to 165 degrees Fahrenheit as defined in the environmental requirements section of the NEMA TS 2 standard, with a noncondensing humidity of 0 to 95%.

Provide certification that the device has successfully completed environmental testing as defined in the environmental requirements section of the NEMA TS 2 standard. Provide certification that the device meets the vibration and shock resistance requirements of Sections 2.1.9 and 2.1.10, respectively, of the NEMA TS 2 standard. Ensure that the edge switch is protected from rain, dust, corrosive elements, and typical conditions found in a roadside environment.

The edge switch shall meet or exceed the following environmental standards:

- IEEE 1613 (electric utility substations)
- IEC 61850-3 (electric utility substations)
- IEEE 61800-3 (variable speed drive systems)
- IEC 61000-6-2 (generic industrial)
- EMF – FCC Part 15 CISPR (EN5502) Class A

I. Ethernet Patch Cable:

Furnish a factory pre-terminated/pre-connectorized Ethernet patch cable with each edge switch. Furnish Ethernet patch cables meeting the following physical requirements:

- Five (5)-foot length
- Category 5e or better
- Factory-installed RJ-45 connectors on both ends
- Molded anti-snag hoods over connectors
- Gold plated connectors

Furnish Fast Ethernet patch cords meeting the following minimum performance requirements:

- TIA/EIA-568-B-5, Additional Transmission Performance Specifications for 4-pair 100 Ω Enhanced Category 5 Cabling
- Frequency Range: 1-100 MHz
- Near-End Crosstalk (NEXT): 30.1 dB
- Power-sum NEXT: 27.1 dB
- Attenuation to Crosstalk Ratio (ACR): 6.1 dB
- Power-sum ACR: 3.1 dB
- Return Loss: 10dB
- Propagation Delay: 548 nsec

5.3. CONSTRUCTION METHODS

A. General:

Ensure that the edge switch is UL listed.

Verify that network/field/data patch cords meet all ANSI/EIA/TIA requirements for Category 5E and Category 6 four-pair unshielded twisted pair cabling with stranded conductors and RJ45 connectors.

Contact the Signal Shop a minimum of 5 days prior to installation for the most current edge switch IP Address, VLAN, subnet mask, default gateway and configuration files.

B. Edge Switch:

Mount the edge switch inside each field cabinet by securely fastening the edge switch to the upper end of the right rear vertical rail of the equipment rack using manufacturer-recommended or Engineer-approved attachment methods, attachment hardware and fasteners.

Ensure that the edge switch is mounted securely in the cabinet and is fully accessible by field technicians without blocking access to other equipment. Verify that fiber-optic jumpers consist of a length of cable that has connectors on both ends, primarily used for interconnecting termination or patching facilities and/or equipment.

5.4. MEASURMENT AND PAYMENT

Ethernet edge switch will be measured and paid as the actual number of Ethernet edge switches furnished, installed, and accepted.

No separate measurement will be made for Ethernet patch cable, power cord, mounting hardware, nuts, bolts, brackets, or edge switch programming as these will be considered incidental to furnishing and installing the edge switch.

Payment will be made under:

Ethernet Edge Switch ..... Each

6. DIGITAL CCTV CAMERA ASSEMBLY

6.1. DESCRIPTION

Furnish and install a Digital CCTV Camera Assembly as described in these Project Special Provisions. All new CCTV cameras shall be fully compatible with the video management software currently in use by the Region and the Statewide Traffic Operations Center (STOC).

Materials

A. General

Furnish and install new CCTV camera assembly at the locations shown on the Plans and as approved by the Engineer. Each assembly consists of the following:

- One dome CCTV color digital signal processing camera unit with zoom lens, filter, control circuit, and accessories in a single enclosed unit
- A NEMA-rated enclosure constructed of aluminum with a clear acrylic dome or approved equal Camera Unit housing.
- Motorized pan, tilt, and zoom
- Built-in video encoder capable of H.264/MPEG-4 compression for video-over IP transmission
- Pole-mount camera attachment assembly
- A lightning arrestor installed in-line between the CCTV camera and the equipment cabinet components.
- All necessary cable, connectors and incidental hardware to make a complete and operable system.

B. Camera and Lens

1. Cameras

Furnish a new CCTV camera that utilizes charged-coupled device (CCD) technology or Complementary Metal-Oxide-Semiconductor (CMOS) technology. The camera must meet the following minimum requirements:

- Video Resolution: Minimum 1920x1080 (HDTV 1080p)
- Aspect Ratio: 16:9
- Overexposure protection: The camera shall have built-in circuitry or a protection device to prevent any damage to the camera when pointed at strong light sources, including the sun
- Low light condition imaging
- Wide Dynamic Range (WDR) operation
- Electronic Image Stabilization (EIS)
- Automatic focus with manual override

2. Zoom Lens

Furnish each camera with a motorized zoom lens that is a high-performance integrated dome system or approved equivalent with automatic iris control with manual override and neutral density spot filter. Furnish lenses that meet the following optical specifications:

- 30X minimum optical zoom, and 12X minimum digital zoom
- Preset positioning: minimum of 128 presets

The lens must be capable of both automatic and remote manual control iris and focus override operation. The lens must be equipped for remote control of zoom and focus, including automatic movement to any of the preset zoom and focus positions. Mechanical or electrical means must be provided to protect the motors from overrunning in extreme positions. The operating voltages of the lens must be compatible with the outputs of the camera control.

Communication Standards:

The CCTV camera shall support the appropriate NTCIP 1205 communication protocol (version 1.08 or higher), ONVIF Profile G protocol, or approved equal.

Networking Standards:

- Network Connection: 10/100 Mbps auto-negotiate
- Frame Rate: 30 to 60 fps
- Data Rate: scalable
- Built-in Web Server
- Unicast & multicast support
- Two simultaneous video streams (Dual H.264 and MJPEG):
    - Video 1: H.264 (Main Profile, at minimum)
    - Video 2: H.264 or MJPEG
- Supported Protocols: DNS, IGMPv2, NTP, RTSP, RTP, TCP, UDP, DHCP, HTTP, IPv4, IP6
- 130 db Wide Dynamic Range (WDR)

The video camera shall allow for the simultaneous encoding and transmission of the two digital video streams, one in H.264 format (high-resolution) and one in H.264 or MJPEG format (low- resolution).

Initially use UDP/IP for video transport and TCP/IP for camera control transport unless otherwise approved by the Engineer.

The 10/100BaseTX port shall support half-duplex or full-duplex and provide auto negotiation and shall be initially configured for full-duplex.

The camera unit shall be remotely manageable using standard network applications via web browser interface administration. Telnet or SNMP monitors shall be provided.

C. Camera Housing

Furnish new dome style enclosure for the CCTV assembly. Equip each housing with mounting assembly for attachment to the CCTV camera pole. The enclosures must be equipped with a sunshield and be fabricated from corrosion resistant aluminum and finished in a neutral color of weather resistant enamel. The enclosure must meet or exceed NEMA 4X ratings. The viewing area of the enclosure must be tempered glass. The pendant must meet NEMA Type 4X, IP66 rating and use 1-1/2-inch NPT thread. The sustained operating temperature must be -50 to 60C (-58 to 144F), condensing temperature 10 to 100% Relative Humidity (RH).

D. Pan and Tilt Unit

Equip each new dome style assembly with a pan and tilt unit. The pan and tilt unit must be integral to the high-performance integrated dome system. The pan and tilt unit must be rated for outdoor operation, provide dynamic braking for instantaneous stopping, prevent drift, and have minimum backlash. The pan and tilt units must meet or exceed the following specifications:

- Pan: continuous 360 Degrees rotation
- Tilt: up/down +2 to -90 degrees minimum
- Motors: Two-phase induction type, continuous duty, instantaneous reversing
- Preset Positioning: minimum of 128 presets
- Low latency for improved Pan and Tilt Control
- FCC, Class A; UL/cUL Listed

E. Video Ethernet Encoder

Furnish cameras with a built-in digital video Ethernet encoder to allow video-over-IP transmission. The encoder units must be built into the camera housing and require no additional equipment to transmit encoded video over IP networks.

Encoders must have the following minimum features:

- Network Interface: Ethernet 10/100Base-TX (RJ-45 connector)
- Protocols: IPv4, Ipv6, HTTP, UpnP, DNS, NTP, RTP, RTSP, TCP, UDP, IGMP, and DHCP
- Security: SSL, SSH, 802.1x, HTTPS encryption with password-controlled browser interface
- Video Streams: Minimum 2 simultaneous streams, user configurable
- Compression: H.264 (MPEG-4 Part 10/AVC)

- Resolution Scalable: NTSC-compatible 320x176 to 1920x1080 (HDTV 1080p
- Aspect Ratio: 16:9
- Frame Rate: 1-30 FPS programmable (full motion)
- Bandwidth: 30 kbps – 6 Mbps, configurable depending on resolution
- Edge Storage: SD/SDHC/SDXC slot supporting up to 64GB memory card

F. Control Receiver/Driver

Provide each new camera unit with a control receiver/driver that is integral to the CCTV dome assembly. The control receiver/driver will receive serial asynchronous data initiated from a camera control unit, decode the command data, perform error checking, and drive the pan/tilt unit, camera controls, and motorized lens. As a minimum, the control receiver/drivers must provide the following functions:

- Zoom in/out
- Automatic focus with manual override
- Tilt up/down
- Automatic iris with manual override
- Pan right/left
- Minimum 128 preset positions for pan, tilt, and zoom, 16 Preset Tours, 256 Dome Presets
- Up to 32 Window Blanks.

In addition, each control receiver/driver must accept status information from the pan/tilt unit and motorized lens for preset positioning of those components. The control receiver/driver will relay pan, tilt, zoom, and focus positions from the field to the remote camera control unit. The control receiver/driver must accept "goto" preset commands from the camera control unit, decode the command data, perform error checking, and drive the pan/tilt and motorized zoom lens to the correct preset position. The preset commands from the camera control unit will consist of unique values for the desired pan, tilt, zoom, and focus positions.

G. Electrical

The camera assembly shall support Power-over-Ethernet (PoE) in compliance with IEEE 802.3. Provide any external power injector that is required for PoE with each CCTV assembly.

H. CCTV Camera Attachment to Pole

Furnish and install an attachment assembly for the CCTV camera unit. Use stainless steel banding approved by the Engineer.

Furnish CCTV attachments that allow for the removal and replacement of the CCTV enclosure as well as providing a weatherproof, weather tight, seal that does not allow moisture to enter the enclosure.

Furnish a CCTV Camera Attachment Assembly that can withstand wind loading at the maximum wind speed and gust factor called for in these Special Provisions and can support a minimum camera unit dead load of 45 pounds (20.4 kg).

I. Riser

Furnish material meeting the requirements of Section 1091-3 and 1098-4 of the 2018 Standard Specifications for Roads and Structures. Furnish a 1" riser with weatherhead for instances where the riser is only carrying an Ethernet cable. For installations where fiber optic cable is routed to the

cabinet through a 2" riser with heat shrink tubing the Contractor may elect to install the Ethernet cable in the same riser with the fiber cable.

J. Data line Surge Suppression

Furnish data line surge protection devices (SPD) shall meet the following minimum requirements:

- UL497B
- Service Voltage: < 60 V
- Protection Modes: L-G (All), L-L (All)
- Response Time: <5 nanoseconds
- Port Type: Shielded RJ-45 IN/Out
- Clamping Level: 75 V
- Surge Current Rating: 20 kA/Pair
- Power Handling: 144 Watts
- Data Rate: up to 10 GbE
- Operating Temperature: -40° F to + 158° F
- Standards Compliance: Cat-5e, EIA/TIA 568A and EIA/TIA 568B
- Warranty: Minimum of 5-year limited warranty

The data line surge protector shall be designed to operate with Power Over Ethernet (POE) devices. The SPD shall be designed such that when used with shielded cabling, a separate earth ground is not required. It shall be compatible with Cat-5e, Cat 6, and Cat-6A cablings.

Protect the electrical and Ethernet cables from the CCTV unit entering the equipment cabinet with surge protection. Provide an integrated unit that accepts unprotected electrical and Ethernet connections and outputs protected electrical and Ethernet connections.

K. POE Injector

Furnish POE Injectors meeting the following minimum performance requirements and that is compatible with the CCTV Camera and Ethernet Switch provided for the project.

- Working temp/humidity: 14° F to 131° F/maximum 90%, non-condensing
- Connectors: Shielded RJ-45, EIA 568A and EIA 568B
- Input Power: 100 to 240 VAC, 50 to 60 Hz
- Pass Through Data Rates: 10/100/1000 Mbps
- Regulatory: IEEE 802.3at (POE)
- Number of Ports: 1 In and 1 Out
- Safety Approvals: UL Listed

Ensure the POE Injector is designed for Plug-and-Play installation, requiring no configurations and supports automatic detection and protection of non-standard Ethernet Terminal configurations.

6.2. Construction Methods

A. General

Obtain approval of the camera locations and orientation from the Engineer prior to installing the CCTV camera assembly.

Mount CCTV camera units on the parapet mount at a height to adequately see traffic in all directions and as approved by the Engineer.

Mount the CCTV camera units such that a minimum 5 feet of clearance is maintained between the camera and the top of the pole.

Mount CCTV cameras on the side of poles nearest intended field of view. Avoid occluding the view with the pole.

Install the data line surge protection device and POE Injector in accordance with the manufacturer's recommendations.

Install the riser in accordance with Section 1722-3 of the 2018 Standard Specifications for Roads and Structures. Install the Ethernet cable in the riser from the field cabinet to the CCTV camera.

B. Electrical and Mechanical Requirements

Install an "Air Terminal and Lightning Protections System" in accordance with the Air Terminal and Lightning Protection System Specification for the the CCTV Camera Assembly. Ground all equipment as called for in the Standard Specifications, these Special Provisions, and the Plans.

Install surge protectors on all ungrounded conductors entering the CCTV enclosure.

6.3. Measurement and Payment

Digital CCTV Camera Assembly will be measured and paid as the actual number of digital CCTV assemblies furnished, installed, integrated, and accepted. No separate measurement will be made for electrical cabling, connectors, CCTV camera attachment assemblies, conduit, condulets, risers, grounding equipment, surge protectors, PoE Injectors, PoE Cable, Air Terminal and Lightning Protection System, compatibility testing, operational testing or any other equipment or labor required to install the digital CCTV assembly.

Payment will be made under:

Digital CCTV Camera Assembly ..... Each

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Project Special Provisions

Culverts

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NORTH CAROLINA PROFESSIONAL SEAL 047653 ENGINEER CLAY T. POOLE

DocuSigned by: 12/13/2022

Clay T Poole

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OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT AT STATION 24+46.00 -L-, 198+61.03 -L-, 181+58.77 -L- **(12-12-13)**

1.0 GENERAL

This Special Provision covers the design, fabrication and construction of precast reinforced concrete box culverts intended for the conveyance of storm water.

If the option is indicated on the plans, the submittal for a precast reinforced box culvert in lieu of a cast-in-place culvert is permitted. Design the precast culvert sections in accordance with ASTM C1577 or the current edition of the AASHTO LRFD Bridge Design Specifications. Rate all sizes of precast reinforced concrete box culverts in accordance with the current edition of the AASHTO Manual for Bridge Evaluation. Ensure the culvert rates for the AASHTO design loads and North Carolina's legal loads (see Section 2.0 for North Carolina's legal loads). Provide the size and number of barrels as indicated on the plans. Detail the culvert with cast-in-place wings walls and footings. Precast wing walls and footings will not be allowed. Provide a precast box culvert that meets the requirements of Section 1077 and any other applicable parts of the Standard Specifications.

The design and rating of the precast and cast-in-place members is the responsibility of the Contractor and is subject to review, comments and approval. Submit two sets of detailed plans and rating sheets for review. Include all details in the plans, including the size and spacing of the required reinforcement necessary to build the precast box and cast-in-place members. Have a North Carolina Registered Professional Engineer check and seal the plans, rating sheets and design calculations. After the plans, rating sheets and design calculations are reviewed and, if necessary, the corrections made, submit one set of plans and rating sheets on 22" x 34" sheets to become part of the contract plans.

If the span, rise and design earth cover for the precast reinforced concrete box culvert are identical to a previously approved submittal, the Contractor may request the previously approved design calculations and plans be considered as the submittal for review and approval. However, a set of plans and rating sheets will need to be submitted to become part of the contract plans.

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2.0 NORTH CAROLINA'S LEGAL LOADS

Apply the following legal loads to all structures carrying interstate traffic:

SINGLE VEHICLE(SV)

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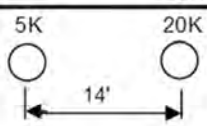
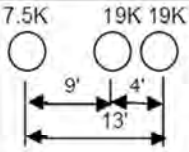
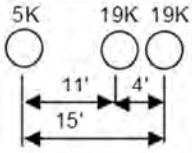
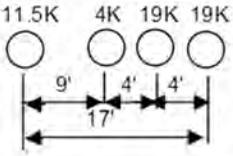
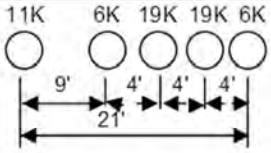
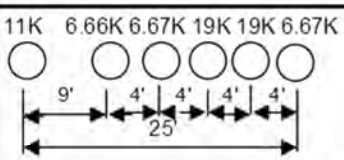
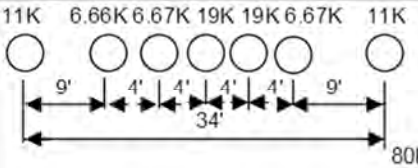
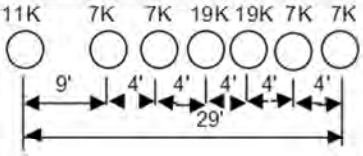
SH	 25K 12.5 TON
S3A	 45.5K 22.75 TON
S3C	 43K 21.5 TON
S4A	 53.5K 26.75 TON
S5A	 61K 30.5 TON
S6A	 69K 34.5 TON
S7A	 80K 40 TON
S7B	 77K 38.5 TON

TRUCK TRACTOR SEMI-TRAILER(TTST)

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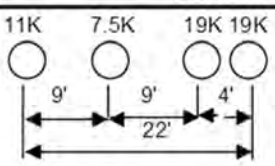
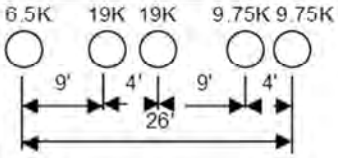
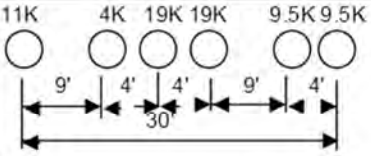
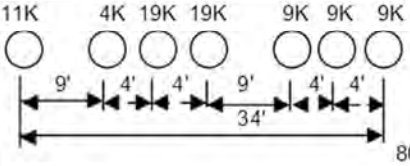
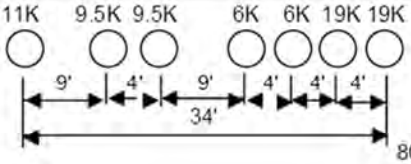
T4A	 56.5K 28.25 TON
T5B	 64K 32 TON
T6A	 72K 36 TON
T7A	 80K 40 TON
T7B	 80K 40 TON

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Apply the following legal loads to all structures carrying non-interstate traffic:

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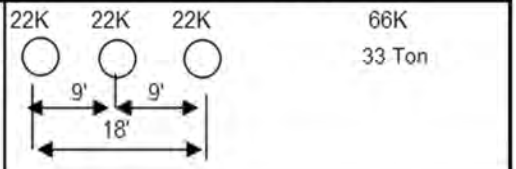
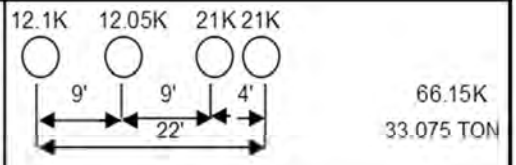
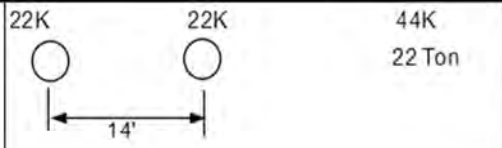
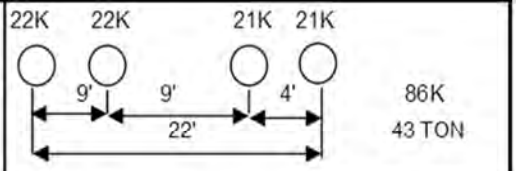
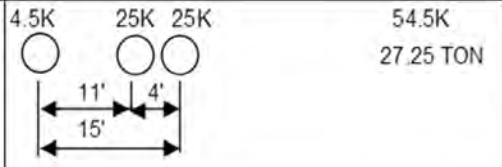
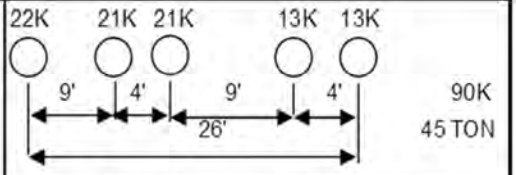
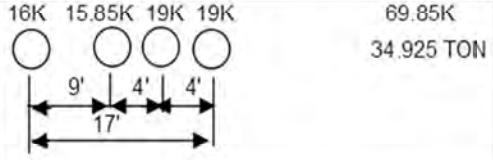
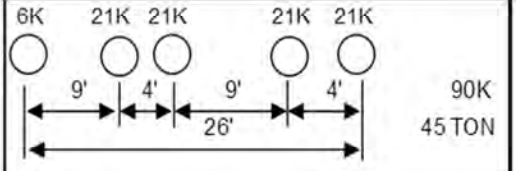
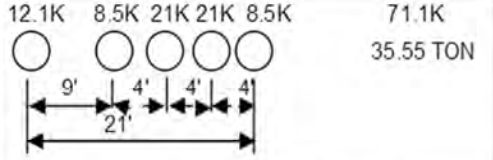
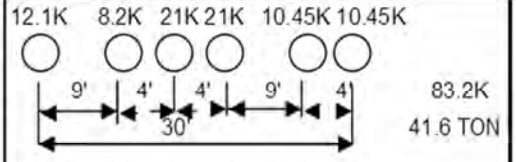
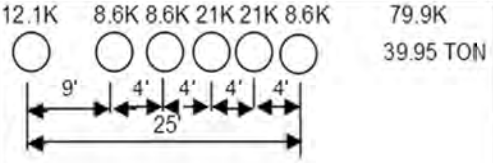
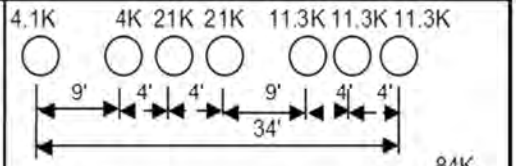
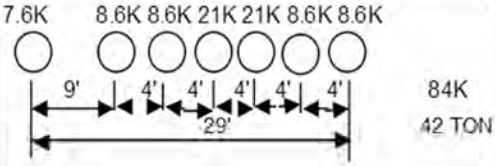
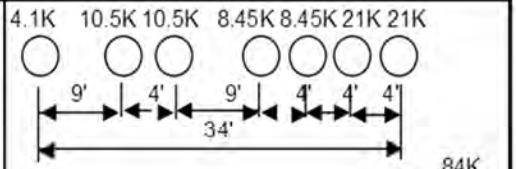
SNSH	27K 13.5 TON	**TNAGRIT3**	 66K 33 Ton
SNGARBS2	40K 20 TON	**TNT4A**	 66.15K 33.075 TON
SNAGRIS2	 44K 22 Ton	**TNAGRIT4**	 86K 43 TON
SNCOTTS3	 54.5K 27.25 TON	**TNAGT5A**	 90K 45 TON
SNAGGRS4	 69.85K 34.925 TON	**TNAGT5B**	 90K 45 TON
SNS5A	 71.1K 35.55 TON	**TNT6A**	 83.2K 41.6 TON
SNS6A	 79.9K 39.95 TON	**TNT7A**	 84K 42 TON
SNS7B	 84K 42 TON	**TNT7B**	 84K 42 TON

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3.0 PRECAST REINFORCED CONCRETE BOX SECTIONS

The precast reinforced concrete box culvert sections shall match the size and hydraulic opening indicated in the contract plans.

A. Design

1. Design Fill – The design earth cover is reported on the plans as the elevation difference between the point of maximum fill and the bottom of the top slab.

2. Placement of Reinforcement – Provide a 1 inch concrete cover over the reinforcement subject to the provisions of Section F. Extend the inside reinforcement into the tongue portion of the joint and the outside reinforcement into the groove portion of the joint. Detail the clear distance of the end wires so it is not less than 1/2 inch or more than 2 inches from the ends of the box section. Assemble reinforcement per the requirements of ASTM C1577 or the approved design. The exposure of the ends of the wires used to position the reinforcement is not a cause for rejection.

3. Laps and Spacing – Use lap splices for the transverse reinforcement. Detail the transverse wires so that the center to center spacing is not less than 2 inches or more than 4 inches. Do not detail the longitudinal wires with a center to center spacing of more than 8 inches.

B. Joints

1. Produce the precast reinforced concrete box section with tongue and groove ends. Design and form these ends of the box section so, when the sections are laid together, they make a continuous line of box sections with a smooth interior free of appreciable irregularities in the flowline, all compatible with the permissible variations given in Section F. The internal joint formed at the tongue and groove ends of the precast units shall be sealed with either bitumen/butyl sealant or closed-cell neoprene material. The internal joint material shall be installed in accordance with the manufacturer's recommendations. The material shall be shown on the shop drawings when they are submitted for review.

2. Seal the external joint with an outside sealer wrap conforming to ASTM C877 that is at least 12 inches wide and covers the joint on both the sides and the top of the box section. Use ConWrap CS-212 from Concrete Sealants, Inc., EZ-Wrap from Press-Seal Gasket Corporation, Seal Wrap from Mar-Mac Manufacturing Co., Inc., Cadilloc External Pipe Joint from Cadilloc, or an approved equal for the outside sealer wrap. If the outside sealer wrap is not applied in a continuous strip along the entire joint, a 12 inch minimum lap of the outside sealer wrap is permitted. Before placing the outside sealer wrap, clean and prime the area receiving the outside sealer wrap in accordance with the sealer wrap manufacturer recommendations. The joint wrap manufacturer installation recommendations shall be included with shop drawings submitted for review. The external joint wrap shall be installed in pieces, as indicated on Figure 1 below:

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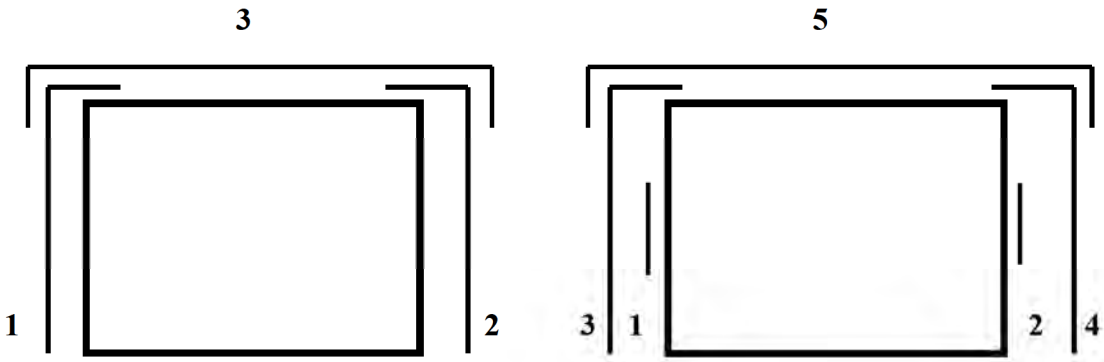

Figure 1

Cover the external joint sealer with a 3 foot strip of filter fabric conforming to Type 4 requirements in Section 1056 of the Standard Specifications.

Place multiple lines of a precast reinforced concrete box culvert such that the longitudinal joint between the sections has a minimum width of 3 inches. Fill the joint between multiple lines of precast box sections with Class A concrete. Use Class A concrete that meets the requirements listed in the Standard Specifications except that Field Compressive Strength Specimens are not required.

C. Manufacture

Manufacture precast reinforced concrete box culvert sections by either the wet cast method or dry cast method.

1. Mixture – In addition to the requirements of Section 1077 of the Standard Specifications, do not proportion the mix with less than 564 lb/yd^3 of portland cement.

2. Strength – Concrete shall develop a minimum 28-day compressive strength of 5000 psi. Movement of the precast sections should be minimized during the initial curing period. Any damage caused by moving or handling during the initial curing phase will be grounds for rejection of that precast section.

3. Air Entrainment – Air entrain the concrete in accordance with Section 1077 - 5(A) of the Standard Specifications. For dry cast manufacturing, air entrainment is not required.

4. Testing – Test the concrete in accordance with the requirements of Section 1077 - 5(B).

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5. Handling – Handling devices or holes are permitted in each box section for the purpose of handling and placing. Submit details of handling devices or holes for approval and do not cast any concrete until approval is granted. Remove all handling devices flush with concrete surfaces as directed. Fill holes in a neat and workmanlike manner with an approved non-metallic non-shrink grout, concrete, or hole plug.

D. Physical Requirements

Acceptability of precast culvert sections is based on concrete cylinders made and tested in accordance with ASTM C31 and ASTM C39.

E. Permissible Variations

1. Flatness – All external surfaces shall be flat, true, and plumb. Irregularities, depressions, or high spots on all external surfaces shall not exceed 1/2 inch in 8 feet.

2. Internal Dimensions – Produce sections so that the internal and haunch dimensions do not vary more than 1/4 inch from the plan dimensions.

3. Adjacent Sections - Internal, external, and haunch dimensions for connecting sections shall not vary more than 1/2 inch.

4. Length of Tongue and Groove – The minimum length of the tongue shall be 4 inches. The minimum length of the groove shall be 4 inches. The dimensions of the tongue and groove shall not vary more than 1/4 inch from the plan dimensions.

5. Slab and Wall Thickness – Produce sections so that the slab and wall thickness are not less than that shown on the plans by more than 5% or 3/16 inch, whichever is greater. A thickness more than that required on the plans is not a cause for rejection.

6. Length of Opposite Surfaces – Produce sections so that variations in laying lengths of two opposite surfaces of the box section meet the requirements of ASTM C1577, Section 11.3.

7. Length of Section – Produce sections so that the underrun in length of a section is not more than 1/2 inch in any box section.

8. Position of Reinforcement – Produce sections so that the maximum variation in the position of the reinforcement is ±3/8 inch for slab and wall thicknesses of 5 inches or less and ±1/2 inch for slab and wall thicknesses greater than 5 inches. Produce sections so that the concrete cover is never less than 5/8 inch as measured to the internal surface or the external surface. The preceding minimum cover limitations do not apply at the mating surfaces of the joint.

9. Area of Reinforcement – Use the design steel shown on the plans for the steel reinforcement. Steel areas greater than those required are not cause for rejection. The permissible variation in diameter of any wire in finished fabric is prescribed for the wire before fabrication by either AASHTO M32 or M225.

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F. Marking

1. Each section shall be match-marked in order of intended installation as indicated on the approved shop drawings. Ensure that pieces fit together neatly and in a workmanlike manner. In order to ensure a good, neat field fit, the Department will verify assembly of the first five adjacent sections or 20% of the total culvert length, whichever is greater, at the producer's facility and match-mark the pieces. This will require that a minimum of three adjacent sections of the culvert be fitted at the production yard at a time and then match-marked. Once three sections have been match-marked, the first section may be removed for shipment and a fourth section set for marking. Continue in a progressive manner until all sections have been properly match-marked. The producer shall document the GO-NO-GO dimensional measurements of each box culvert section produced through the post-pour inspection process.

2. Clearly mark each section of the box culvert in accordance with ASTM C1577, Section 15. The information requirements of Section 15.1 shall be clearly marked on the inner surface of each section.

G. Construction

1. Pre-installation Meeting – A pre-installation meeting is required prior to installation. Representatives from the Contractor, the precast box manufacturer, and the Department should attend this meeting. The precast box manufacturer representative shall be on site during installation.

2. Foundation – Foundation for precast box culvert shall meet the requirements of Section 414 of the Standard Specifications. In addition, Type VI foundation material shall be encapsulated in filter fabric conforming to Type 4 requirements in Section 1056 of the Standard Specifications. The filter fabric shall be placed perpendicular to the culvert barrel. Provide sufficient overhang beyond the excavation to allow a minimum lap of 3 feet when the foundation material is placed and fabric wrapped on top. Perpendicular sections of fabric shall be continuous. A minimum lap of 2 feet shall be provided between sections of fabric.

3. Installation – Sections shall be placed at the beginning of the outlet end of the culvert with the groove end being laid upgrade. Tongue sections shall be laid into the groove sections. Positive means shall be provided to pull each section firmly into the previously placed section so that the joints are tightly homed. Use a "come-along", box pullers or other approved methods to create a positive means of joining box sections. Construction equipment shall not have direct contact with the box section. The load of the box shall be suspended by lifting device during joining procedure.

4. Backfill – Complete backfill in accordance with Section 414 of the Standard Specifications.

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4.0 BASIS OF PAYMENT

Any additional cost of redesigning will be paid for by the Contractor if Precast Reinforced Concrete Culvert is used in lieu of the cast-in-place culvert shown on the plans. Except for Foundation Conditioning Material and Culvert Excavation, payment for the Precast Box Culvert will be a lump sum amount equal to the payment that would be allowed for construction of a Cast-in-Place Box Culvert. Plan quantities and unit bid prices will be used to compute the lump sum amount. Such price and payment will be full compensation for all work covered by this Special Provision, the plans and applicable parts of the Standard Specifications and will include, but not be limited to, furnishing all labor, materials (including all filter fabric), equipment and other incidentals necessary to complete this work. Such price and payment will also be full compensation for concrete, reinforcing steel, labor, equipment and all other related materials necessary for the completion of the barrel section, and the construction of the headwalls, leveling pad, end curtain walls, wings and wing footings.

FALSEWORK AND FORMWORK (2-14-22)

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.

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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.

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.

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For links slabs, the tops of girders directly beneath the link slab shall be free of overhang falsework attachments or other hardware. Submit calculations and working drawings for overhang falsework in the link slab region.

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 ¾".

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.

Table 2.2 - Wind Pressure Values

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Height Zone feet above ground	Pressure, lb/ft^2 for Indicated Wind Velocity, mph				
	70	80	90	100	110
0 to 30	15	20	25	30	35
30 to 50	20	25	30	35	40
50 to 100	25	30	35	40	45
over 100	30	35	40	45	50

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.

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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		

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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.

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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 (2-14-22)

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

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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.

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 Email: SMU-wdr@ncdot.gov (do not cc SMU Working Drawings staff)

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.

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.

For submittals to the Geotechnical Engineering Unit, use the following addresses:

For projects in Divisions 1-7, use the following Eastern Regional Office addresses:

Via Email: EastGeotechnicalSubmittal@ncdot.gov

Via US mail:

Mr. David Hering, L.G., P. E.
Assistant State Geotechnical
Engineer – Eastern Region
North Carolina Department
of Transportation

Via other delivery service:

Mr. David Hering, L.G., P. E.
Assistant State Geotechnical
Engineer – Eastern Region
North Carolina Department
of Transportation

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Geotechnical Engineering Unit
Eastern Regional Office
1570 Mail Service Center
Raleigh, NC 27699-1570

Geotechnical Engineering Unit
Eastern Regional Office
3301 Jones Sausage Road, Suite 100
Garner, NC 27529

For projects in Divisions 8-14, use the following Western Regional Office addresses:

Via Email: WestGeotechnicalSubmittal@ncdot.gov

Via US mail or other delivery service:

Mr. Eric Williams, P. E.
Assistant State Geotechnical Engineer – Western Region
North Carolina Department of Transportation
Geotechnical Engineering Unit
Western Regional Office
5253 Z Max Boulevard
Harrisburg, NC 28075

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
jlbolden@ncdot.gov

Secondary Structures Contacts: Emmanuel Omile (919) 707 – 6451
eomile@ncdot.gov

Madonna Rorie (919) 707 – 6508
mrorie@ncdot.gov

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

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3.0 SUBMITTAL COPIES

Furnish one complete copy of each submittal, including all attachments, to the Engineer. At the same time, submit a copy of the same complete submittal directly to the Structures Management Unit and/or the Geotechnical Engineering Unit as specified in the tables below.

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	Submittal Required by Structures Management Unit?	Submittal Required by Geotechnical Engineering Unit?	Contract Reference Requiring Submittal [1]
Arch Culvert Falsework	Y	N	Plan Note, SN Sheet & "Falsework and Formwork"
Box Culvert Falsework [7]	Y	N	Plan Note, SN Sheet & "Falsework and Formwork"
Cofferdams	Y	Y	Article 410-4
Foam Joint Seals [6]	Y	N	"Foam Joint Seals"
Expansion Joint Seals (hold down plate type with base angle)	Y	N	"Expansion Joint Seals"
Expansion Joint Seals (modular)	Y	N	"Modular Expansion Joint Seals"
Expansion Joint Seals (strip seals)	Y	N	"Strip Seal Expansion Joints"
Falsework & Forms [2] (substructure)	Y	N	Article 420-3 & "Falsework and Formwork"
Falsework & Forms (superstructure)	Y	N	Article 420-3 & "Falsework and Formwork"

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Girder Erection over Railroad	Y	N	Railroad Provisions
Maintenance and Protection of Traffic Beneath Proposed Structure	Y	N	"Maintenance and Protection of Traffic Beneath Proposed Structure at Station ___"
Metal Bridge Railing	Y	N	Plan Note
Metal Stay-in-Place Forms	Y	N	Article 420-3
Metalwork for Elastomeric Bearings [4,5]	Y	N	Article 1072-8
Miscellaneous Metalwork [4,5]	Y	N	Article 1072-8
Disc Bearings [4]	Y	N	"Disc Bearings"
Overhead and Digital Message Signs (DMS) (metalwork and foundations)	Y	N	Applicable Provisions
Placement of Equipment on Structures (cranes, etc.)	Y	N	Article 420-20
Prestressed Concrete Box Beam (detensioning sequences) [3]	Y	N	Article 1078-11
Precast Concrete Box Culverts	Y	N	"Optional Precast Reinforced Concrete Box Culvert at Station ___"
Prestressed Concrete Cored Slab (detensioning sequences) [3]	Y	N	Article 1078-11
Prestressed Concrete Deck Panels	Y	N	Article 420-3
Prestressed Concrete Girder (strand elongation and detensioning sequences)	Y	N	Articles 1078-8 and 1078-11
Removal of Existing Structure over Railroad	Y	N	Railroad Provisions
Revised Bridge Deck Plans (adaptation to prestressed deck panels)	Y	N	Article 420-3
Revised Bridge Deck Plans (adaptation to modular expansion joint seals)	Y	N	"Modular Expansion Joint Seals"

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Sound Barrier Wall (precast items)	Y	N	Article 1077-2 & "Sound Barrier Wall"
Sound Barrier Wall Steel Fabrication Plans [5]	Y	N	Article 1072-8 & "Sound Barrier Wall"
Structural Steel [4]	Y	N	Article 1072-8
Temporary Detour Structures	Y	Y	Article 400-3 & "Construction, Maintenance and Removal of Temporary Structure at Station ____"
TFE Expansion Bearings [4]	Y	N	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	Submittals Required by Geotechnical Engineering Unit	Submittals Required by Structures Management Unit	Contract Reference Requiring Submittal [1]
Drilled Pier Construction Plans [2]	Y	N	Subarticle 411-3(A)
Crosshole Sonic Logging (CSL) Reports [2]	Y	N	Subarticle 411-5(A)(2)

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Pile Driving Equipment Data Forms [2,3]	Y	N	Subarticle 450-3(D)(2)
Pile Driving Analyzer (PDA) Reports [2]	Y	N	Subarticle 450-3(F)(3)
Retaining Walls [4]	Y; drawings and calculations	Y; drawings	Applicable Provisions
Temporary Shoring [4]	Y; drawings and calculations	Y; 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.

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CRANE SAFETY SUBMITTAL LIST

A. **Competent Person:** 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. **Riggers:** 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. **Crane Inspections:** Inspection records for all cranes shall be current and readily accessible for review upon request.

D. **Certifications:** 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.

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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.

PROJECT SPECIAL PROVISION

(10-18-95) (Rev. 8-15-23) Z-1a

PERMITS

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	AUTHORITY GRANTING THE PERMIT
Dredge and Fill and/or Work in Navigable Waters (404)	U. S. Army Corps of Engineers
Water Quality (401)	Division of Environmental Management, DEQ State of North Carolina

The Contractor shall comply with all applicable permit conditions during construction of this project.

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.

P-2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

September 2, 2022

MEMORANDUM TO: Mr. Drew Cox, P.E., Division Engineer
Division 6

DocuSigned by:
Mack C. Rivenbark III
AAAD1248B309416...

FROM: for Michael Turchy, Group Leader
Environmental Coordination & Permitting

SUBJECT: Environmental Permits for NC 55 from south of SR 1532 (Oak Grove Church Road) in Harnett County to NC 42 in Wake County.
WBS No. 46377.1.1 **STIP R-5705**

Please find enclosed the following permits for this project:

Agency	Permit Type	Permit Expiration
US Army Corps of Engineers Section 404 Clean Water Act	Individual Section 404	December 31, 2027
NC Division of Water Resources Section 401 Clean Water Act	Individual Water Quality Certification	December 31, 2027

Please feel free to contact our Group for any questions.

ec:
NCDOT Permit Website (https://xfer.services.ncdot.gov/pdea/PermIssued/)

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL ANALYSIS UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

Telephone: (919) 707-6000
Customer Service: 1-877-368-4968
Website: www.ncdot.gov

Location:
1000 BIRCH RIDGE DRIVE
RALEIGH NC 27610

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

September 2, 2022

Regulatory Division

Action ID: SAW-2019-02118

North Carolina Department of Transportation (NCDOT)
Attn: Mr. Michael Turchy
1598 Mail Service Center
Raleigh, North Carolina 27699

Dear Mr. Turchy:

Enclosed is a Department of the Army permit for the R-5705 project which involves construction activities related to the proposed widening of NC 55 from south of SR 1532 (Oak Grove Church Road) to NC 42 and construction of a new location bypass around the Town of Angier to the west, constructed as a four-lane median divided roadway, in Harnett and Wake Counties, North Carolina. The Corps is issuing this permit in response to your written request of December 21, 2021, revisions dated March 1, 2022, and the ensuing administrative record.

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 conditions require that:

a. You must complete construction before December 31, 2027.

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.

d. In order to compensate for impacts associated with this permit, mitigation shall be provided in accordance with the provisions outlined in the U.S. Army Corps of Engineers, Wilmington District, 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 authorization.

You should address all questions regarding this authorization to Liz Hair at the Wilmington Regulatory Field Office, telephone 910-251-4049, or email at sarah.e.hair@usace.army.mil.

FOR THE CHIEF, REGULATORY DIVISION

Monte Matthews

Date: 2022.09.02 17:23:47 -04'00'

Monte Matthews
Lead Project Manager
Wilmington District

Enclosures

Electronic copy:

Ms. Hannah Sprinkle, NCDEQ-DWR
Ms. Amanetta Somerville, USEPA
Mr. Gary Jordan, USFWS
Mr. Travis Wilson, NCWRC
Ms. Renee Gledhill-Earley, SHPO
NCDMS

DEPARTMENT OF THE ARMY PERMIT

Permittee: **North Carolina Department of Transportation**
Attn: Michael Turchy

Permit No.: **SAW-2019-02118, STIP R-5705**

Issuing Office: **CESAW-RG-L**

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 North Carolina Department of Transportation (NCDOT) proposes to widen NC 55 from south of SR 1532 (Oak Grove Church Road) to NC 42 and construct a new location bypass around the Town of Angier to the west, constructed as a four-lane median divided roadway, with partially controlled access throughout the project, in Harnett and Wake Counties, North Carolina.**

Proposed total impacts associated with the overall R-5705 project include permanent impacts (fill, excavation, mechanized land clearing, and bank stabilization) to aquatic resources are 18.45 acres wetland and 5,519 linear feet of stream channel. Proposed permanent open water impacts total 8.9-acre. Potential impacts associated with utility relocations of section A are included within these impact amounts.

Project Location: **The project site is located along NC Highway 55 from south of SR 1532 (Oak Grove Church Road) to NC Highway 42, and within agricultural and forested areas to the west of NC Highway 55, in Harnett and Wake Counties, North Carolina.**

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2027. 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.

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.

Michael Turchy

(PERMITTEE) **NC DEPARTMENT OF TRANSPORTAION**
Attn: Michael Turchy

02-September-2022
(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Monte Matthews

Date: 2022.09.02 17:38:55 -04'00'

For
(DISTRICT COMMANDER) **BENJAMIN A. BENNETT, COLONEL**

(DATE)

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE)

(DATE)

*U.S. GOVERNMENT PRINTING OFFICE: 1986 - 717-425

SAW-2019-02118
R-5705
SPECIAL CONDITIONS

WORK LIMITS / NOTIFICATION

1. **Phased Permit:** This permit only authorizes work on Sections R-5705 A and R-5705 B of TIP R-5705. Construction on Sections R-5705 C of TIP R-5705 shall not commence until all the following occur: (a) final design has been completed for those sections 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 and the Corps concurs with this assessment; (c) any modification to the plans have been approved by the Corps in writing; and (d) a final compensatory mitigation plan 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 attached permit plans entitled Wetland and Surface Water Impacts-R-5705 and the Wetland and Surface Water Impacts Summary Tables dated March 1, 2022 (R-5705A), and December 21, 2021 (R-5705 B). The Permittee shall ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Any modification to the attached permit plans must be approved by the U.S. Army Corps of Engineers (Corps) prior to any active construction in waters or wetlands.

3. **Unauthorized Dredge and/or Fill:** Except as authorized by this permit or any Corps 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. In addition, except as specified in the plans attached 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, in such a manner as to impair normal flows and circulation patterns within, into, or out of waters or wetlands or to reduce the reach of waters or wetlands.

4. **Permit Distribution:** The Permittees 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 and drawings shall be available at the project site during construction and maintenance of this project.

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R-5705
SPECIAL CONDITIONS

5. **Preconstruction Meeting:** The Permittee shall schedule and attend a preconstruction meeting between its representatives, the contractor's representatives, and the Corps, Wilmington 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, Wilmington 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 North Carolina Division of Water Resources (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.

6. **Notification of Construction Commencement and Completion:** The Permittees shall notify the Corps in writing prior to beginning the work authorized by this permit and again upon completion of the work authorized by this permit.

7. **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 Wilmington Field Office, Attn: Liz Hair at 910-251-4049 / sarah.e.hair@usace.army.mil. The Permittees shall reference the following permit number, SAW-2019-02118, on all submittals.

8. **Permit Revocation:** The Permittees, 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.

9. **Reporting Violations:** Violation of these permit conditions or violation of Section 404 of the Clean Water Act shall be reported to the Corps in writing and by telephone at: 910-251-4049 / sarah.e.hair@usace.army.mil within 24 hours of the Permittee's discovery of the violation.

10. **Endangered Species Act:** The Permittees shall implement all necessary measures to ensure the authorized activity does not kill, injure, capture, harass, or otherwise harm any federally-listed threatened or endangered species. While

accomplishing the authorized work, if the Permittees discover or observe an injured or dead threatened or endangered species, the U.S. Army Corps of Engineers, Wilmington District Wilmington Field Office, Attn: Liz Hair at 910-251-4049/ sarah.e.hair@usace.army.mil will be immediately notified to initiate the required Federal coordination.

11. **Endangered Species Act (Continued):** The US. Fish and Wildlife Service's (USFWS's) Programmatic Biological Opinion (PBO) titled, "NCDOT Program Effects on the Northern Long-eared Bat in Divisions 1-8", dated November 6, 2020, contains agreed upon conservation measures for the NLEB. As noted in the PBO, applicability of these conservation measures varies depending on the location of the project. Your authorization under this Department of the Army permit is conditional upon your compliance with all applicable agreed upon conservation measures in the PBO, which are incorporated by reference in this permit. Failure to comply with the applicable these conservation measures would constitute non-compliance with your Department of the Army permit. The USFWS is the appropriate authority to determine compliance with the terms and conditions of its PBO, and with the ESA.

12. **National Historic Preservation Act:** While accomplishing the authorized work, if the Permittees discover any previously unknown cultural resources, the District Engineer will be immediately notified so that required coordination can be initiated with the North Carolina Division of Natural and Cultural Resources.

13. **Culverts:**

    a. 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.

    b. Measures shall be included in the construction/installation 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.

c. 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 Corps.

d. 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.

14. **Maintain Flows and Circulation Patterns of Waters:** Except as specified in the plans attached 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, 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.

15. **Sediment and Erosion Control:**

a. 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.

b. 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 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.

c. The Permittees 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.

d. The Permittees 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 adjacent waters or wetlands.

16. **Clean Fill:** The Permittees shall use only clean fill material for this project. The fill material shall be free of items such as trash, construction debris, metal and plastic products, and concrete block with exposed metal 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.

17. **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.

18. **Borrow and Waste:** 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 borrow and/or waste sites associated with this project. The Permittee shall provide the Corps with appropriate maps indicating the locations of proposed borrow and/or waste sites as soon as such information is available. The Permittee shall submit to the Corps site-specific information needed to ensure that borrow and/or waste sites comply with all applicable Federal requirements, to include compliance with the Endangered Species Act and the National Historic Preservation Act, such as

surveys or correspondence with agencies (e.g., the USFWS, the NC-HPO, etc.). The required information shall also include the location of all aquatic features, if any, out to a distance of 400 feet beyond the nearest boundary of the site. The Permittee shall not approve any borrow and/or waste sites before receiving written confirmation from the Corps that the proposed site meets all Federal requirements, whether or not waters of the U.S., including wetlands, are located in the proposed borrow and/or waste site. All delineations of aquatic sites on borrow and/or waste sites shall be verified by the Corps and shown on the approved reclamation plans. The Permittee shall ensure that all borrow and/or waste sites comply with Special Condition 2 of this permit. Additionally, the Permittee shall produce and maintain documentation of all borrow and waste sites associated with this project. This documentation will include data regarding soils, vegetation, hydrology, any delineation(s) of aquatic sites, and any jurisdictional determinations made by the Corps to clearly demonstrate compliance with Special Condition 2. All information will be available to the Corps 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. This documentation will be provided to the Corps within 30 days of the completion of the reclamation work.

19. **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 Permittees 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.

20. **Aquatic Life Movement:** No activity may substantially disrupt the 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, except as authorized as indirect impacts, to maintain low flows to sustain the movement of aquatic species.

21. **Prohibitions on Concrete:** The Permittees 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 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).

SAW-2019-02118
R-5705
SPECIAL CONDITIONS

22. **Compensatory Mitigation:** 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 Forms. The requirements of these forms, including any special conditions listed on these forms, are hereby incorporated as special conditions of this permit.

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ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
RICHARD E. ROGERS, JR.
Director

NORTH CAROLINA
Environmental Quality

April 8, 2022

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: Correction to 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act and Neuse Buffer Rules with ADDITIONAL CONDITIONS for the proposed widening of NC-55 and the construction of a bypass around the town of Angier in Harnett and Wake Counties, TIP R-5705. NCDWR Project No. 20201864

Dear Mr. Harris:

Attached hereto is a copy of Certification No. 004710 issued to The North Carolina Department of Transportation (NCDOT) dated March 22, 2022 and revised April 8, 2022.

This approval is for the purpose and design described in your application. The plans and specifications for this project are incorporated by reference as part of this Water Quality Certification. If you change your project, you must notify the Division and you may be required to submit a new application package with the appropriate fee. If the property is sold, the new owner must be given a copy of this Certification and is responsible for complying with all conditions. [15A NCAC 02H .0507(d)(2)]. This Certification does not relieve the permittee of the responsibility to obtain all other required Federal, State, or Local approvals before proceeding with the project, including those required by, but not limited to, Sediment and Erosion Control, Non-Discharge, Water Supply Watershed, and Trout Buffer regulations.

If we can be of further assistance, do not hesitate to contact us.

Sincerely,
DocuSigned by:
Amy Chapman
9C9886312DCD474...
Richard E. Rogers, Jr., Director
Division of Water Resources

Attachments

Electronic copy only distribution:
Liz Hair, US Army Corps of Engineers, Wilmington Field Office
Gregory Price, Division 6 Environmental Officer
Heather Montague, Division 5 Environmental Officer
Chris Rivenbark, NC Department of Transportation
Amanetta Somerville, US Environmental Protection Agency
Gary Jordan, US Fish and Wildlife Service

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Travis Wilson, NC Wildlife Resources Commission
Beth Harmon, Division of Mitigation Services
Hannah Sprinkle, NC Division of Water Resources Wilmington Regional Office
File Copy

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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 9.54 acres (section A), 7.11 acres (section B) of jurisdictional wetlands, and 1925 linear feet (section A), 2771 linear feet (section B) of jurisdictional streams in Harnett and Wake County. The project shall be constructed pursuant to the application dated received December 21, 2021 and revised March 1, 2022. This approval letter replaces the letter issued on March 22, 2022. The authorized impacts are as described below:

R-5705A:

Stream Impact in the Cape Fear River Basin- Section A

Permit Drawing Site Number	NRTR Label	Type	Permanent Impacts (lf)	Temporary Impacts (lf)	Total Impact (lf)	Mitigation Required
1	SAP	Intermittent	---	30	30	No
2	East Buies Creek	Perennial	34	10	44	No
3	SAO	Perennial	116	10	126	No
4	East Buies Creek	Perennial	100	10	110	No
6	SAL	Perennial	268	30	298	No
7	SAM	Intermittent	30	---	30	No
11	Buries Creek	Perennial	224	86	310	No
15	SAJ	Intermittent	102	35	137	No
16	SAJ	Intermittent	57	9	66	No
18	SAI	Intermittent	41	7	48	No
20	SAH	Perennial	216	45	261	No
24	SAG	Perennial	154	33	187	No
28	SAQ	Perennial	19	15	34	No
30	SAS	Intermittent	224	20	244	No
Totals			**1585**	**340**	**1925**	

Total Stream Impact for Project:1925 linear feet.
Bank Stabilization included

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Wetland Impacts in the Cape Fear River Basin-Section A

Permit Drawing Site Number	Permanent Fill (ac)	Temporary Fill (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Total Impacts (ac)
1	---	---	---	---	0.001	0.001
2	0.02	---	0.003	---	0.03	0.05
3	---	---	---	---	---	0
4	0.22	---	0.1	0.07	0.06	0.45
5	0.05	---	---	---	0.01	0.06
9	0.04	---	---	---	0.002	0.042
10	0.09	---	0.05	---	0.04	0.18
11	1.11	---	0.1	---	0.35	1.56
12	0.09	0.91	0.04	---	0.09	1.13
13	---	---	---	---	0.02	0.02
14	0.004	---	---	---	0.02	0.024
15	0.97	---	0.34	---	0.32	1.63
16	---	---	0.005	---	0.02	0.025
17	0.66	---	0.06	---	0.17	0.89
19	0.05	---	---	---	0.01	0.06
20	0.08	---	0.06	0.02	0.02	0.18
21	0.06	---	0.04	---	0.03	0.13
22	0.04	---	0.03	---	0.005	0.075
23	0.02	---	0.02	---	0.02	0.06
24	0.07	---	0.05	0.03	0.17	0.32
25	0.31	---	0.06	0.03	0.16	0.56
26	0.004	---	---	---	0.02	0.024
27	0.18	---	0.05	0.006	0.02	0.256
29	0.35	---	0.04	0.05	0.04	0.48
30	0.96	---	---	---	0.14	1.1
*Utilities 1	---	---	---	---	0.01	0.01
*Utilities 2	---	---	---	---	0.11	0.11
*Utilities 3	---	---	---	---	0.11	0.11
Totals	5.378	0.91	1.048	0.206	1.998	9.54
Total Wetlands	**9.54 ac**					

Total Wetland Impact for Project: 9.54 acres. Total Permanent Impacts: 6.6 acres.
utilities included

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Open Water Impacts in the Cape Fear River Basin-Section A

Permit Drawing Site Number	Permanent Fill (ac)	Temporary Fill (ac)
8	0.95	---
15	0.21	---
19	0.23	---
25	0.35	---
27	5.05	---
Totals	**6.79**	**---**

Total Open Water Impact for Project: 6.79 acres.

R-5705B:

Stream Impacts in the Cape Fear River Basin-Section B

Permit Drawing Site Number	NRTR Label	Type	Permanent Impacts (lf)	Temporary Impacts (lf)	Total Impact (lf)	Mitigation Required
2	SAF	Perennial	198	61	259	No
3	SAE	Perennial	110	---	110	No
4	SAC	Intermittent	223	39	262	No
8	SAD	Perennial	514	60	574	Yes
9	SAB	Perennial	168	12	180	No
10	SAB	Intermittent	---	51	51	No
12	SY	Perennial	300	39	339	Yes
15	SAA	Intermittent	86	20	106	No
16	SZ	Perennial	207	42	249	No
17	SW	Perennial	235	48	283	Yes
18	SW	Perennial	168	73	241	Yes
19	SV	Perennial	84	17	101	No
23	SX	Intermittent	---	16	16	No
Totals			**2293**	**478**	**2771**	---

Total Stream Impact for Project: 2771 linear feet.
Bank Stabilization included

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Wetland Impacts in the Cape Fear River Basin- Section B

Permit Drawing Site Number	Permanent Fill (ac)	Temporary Fill (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Total Impacts (ac)
2	0.32	---	0.006	---	0.04	0.366
4	0.5	---	0.007	---	0.04	0.547
5	0.43	---	---	---	0.03	0.46
6	1.16	---	0.04	---	0.19	1.39
8	0.73	---	0.07	0.08	0.07	0.95
9	0.03	---	---	---	---	0.03
10	---	---	0.03	---	0.09	0.12
12	0.22	---	---	---	0.02	0.24
13	0.04	---	0.07	---	0.11	0.22
14	0.006	---	---	---	0.01	0.016
15	0.12	---	---	---	0.01	0.13
16	0.45	---	0.02	---	0.05	0.52
17	1.46	---	0.07	---	0.20	1.73
18	0.14	---	0.013	---	0.07	0.223
19	0.02	---	---	---	0.02	0.04
20	---	---	0.007	---	0.02	0.007
21	---	---	---	0.02	---	0.02
22	0.006	0.006	---	---	---	0.012
24	0.02	---	0.02		0.02	0.06
Totals	5.652	0.006	0.353	0.1	1.0	7.11
Total Wetlands	**7.11 ac**					

Total Wetland Impact for Project: 7.11 acres. Total Permanent Impacts: 6.11 acres.

Open Water Impacts in the Cape Fear River Basin-Section B

Permit Drawing Site Number	Permanent Fill (ac)	Temporary Fill (ac)
1	0.77	---
7	0.11	---
10	0.25	---
11	0.98	---
Totals	**2.11**	**---**

Total Open Water Impact for Project: 2.11 acres.

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R-5705C:

Preliminary proposed Impacts for the Future Section R-5705C:

Steam (lf)	Open Water (ac)	Wetlands (ac)	Riparian Buffer (sq.ft.) Zones 1/2	
			Zone 1	Zone2
1602	0.05*	5.75	97,390	48,123

*includes ponds and tributary

The application provides adequate assurance that the discharge of fill material into the waters of the Cape Fear 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 December 21, 2021 and revised March 1, 2022. 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.

This Water Quality Certification neither grants nor affirms any property right, license, or privilege in any lands or waters, or any right of use in any waters. This Water Quality Certification does not authorize any person to interfere with the riparian rights, littoral rights, or water use rights of any other person and does not create any prescriptive right or any right of priority regarding any usage of water. This Water Quality Certification shall not be interposed as a defense in any action respecting the determination of riparian or littoral rights or other rights to water use. No consumptive user is deemed by virtue of this Water Quality Certification to possess any prescriptive or other right of priority with respect to any other consumptive user regardless of the quantity of the withdrawal or the date on which the withdrawal was initiated or expanded. Upon the presentation of proper credentials, the Division may inspect the property.

Condition(s) of Certification:

Project Specific Conditions

1. The NCDOT Division Environmental Officer or Environmental Assistant will conduct a pre-construction 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 1083 linear feet of impact to streams is required for Section R-5705B. 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 dated December 9, 2021, that agreed to implement the mitigation for the project. The DMS has indicated in a letter 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.

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3. Compensatory mitigation for impacts to 6.59 acres of wetlands for Section R-5705A and 6.11 acres of wetlands for Section R-5705B is required. We understand that you have chosen to perform compensatory mitigation for impacts to wetlands through the North Carolina Division of Mitigation Services (DMS) (formerly NCEEP), and that the DMS has agreed to implement the mitigation for the project. DMS has indicated in a letter dated December 9, 2021, that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with DMS's Mitigation Banking Instrument signed July 28, 2010.

4. All portions of the proposed project draining to 303(d) listed watersheds shall be designed, constructed, and operated with sediment and erosion control measures that meet *Design Standards in Sensitive Watersheds* (15A NCAC 4B .0124). However, due to the size of the project, NC DOT shall not be required to meet 15A NCAC 4B .0124(a) regarding the maximum amount of uncovered acres.

5. All portions of the proposed project draining to 303(d) listed watersheds shall not discharge stormwater directly to surface waters. Stormwater shall be treated using appropriate best management practices (e.g., vegetated conveyances, constructed wetlands, detention ponds, etc.) prior to discharging to surface waters

6. When final design plans are completed for R-5705 Section C, a modification to the 401 Water Quality Certification and the Neuse River Riparian Buffer Authorization shall be submitted 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-5705 Section C shall begin until after the permittee applies for, and receives a written modification of the 401 Water Quality Certification and the Neuse River Riparian Buffer Authorization from the NC Division of Water Resources.

7. 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)]

General Conditions

8. 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.

9. 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)]

10. 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)]

11. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization, including all non-commercial borrow and waste sites associated with the project, 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]'

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12. 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]

13. 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)]

14. 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)]

15. 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)]

16. 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)]

17. 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)]

18. 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)]

19. In accordance with commitments made in your application, all clearing of vegetation for purpose of relocating overhead power lines within jurisdictional wetlands shall be performed without the use of mechanized equipment. [15A NCAC 02H.0506(b)(3)

20. 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)]

21. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited. [15A NCAC 02H.0506(b)(3)]

22. 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]

23. 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.*

24. 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.

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25. 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.

26. 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]

27. 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)]

28. NCDOT shall be in compliance with the NCS000250 issued to the NCDOT, including the applicable requirements of the NCG010000. Please note the extra protections for the sensitive watersheds.

29. At locations where ponds will be drained, proper measures will be taken to drain the pond with limited impact to upstream and downstream channel stability as well as to native aquatic species. Proper measures will be taken to avoid sediment release and/or sediment accumulation downstream as a result of pond draining. If typical pond draining techniques will create significant disturbance to native aquatic species, additional measures such as collection and relocation may be necessary to prevent a significant fish kill. NCDOT shall consult with NC Wildlife Resources staff to determine if there are any sensitive species, and the most appropriate measures to limit impacts to these species. The permittee shall observe any natural channel re-establishment, or utilize natural channel construction techniques, to ensure that the jurisdictional stream channel above and below the drained pond remain stable, and that no additional impacts occur within the natural stream channel as a result of draining the pond. *[15A NCAC 2H.0506(b)(3)]*

30. No drill slurry or water that has been in contact with uncured concrete shall be allowed to enter surface waters. This water shall be captured, treated, and disposed of properly. [15A NCAC 02H .0506(b)(3)

31. If multiple pipes or barrels are required, they shall be designed to mimic natural stream cross section as closely as possible including pipes or barrels at flood plain elevation and/or sills where appropriate. Widening the stream channel should be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage. [15A NCAC 02H.0506(b)(2)]

32. Riprap shall not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be properly designed, sized and installed. [15A NCAC 02H.0506(b)(2)]

33. The stream channel shall be excavated no deeper than the natural bed material of the stream, to the maximum extent practicable. Efforts must be made to minimize impacts to the stream banks, as well as to vegetation responsible for maintaining the stream bank stability. Any applicable riparian buffer impact for access to stream channel shall be temporary and be revegetated with native riparian species. [15A NCAC 02H.0506(b)(2)]

34. Pipes and culverts used exclusively to maintain equilibrium in wetlands, where aquatic life passage is not a concern, shall not be buried. These pipes shall be installed at natural ground elevation.

35. A turbidity curtain will be installed in the stream if driving or drilling activities occur within the stream channel, on the stream bank, or within 5 feet of the top of bank. This condition can be waived with prior approval from the NCDWR. [15A NCAC 02H .0506(b)(3)

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36. 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)]

37. Tall fescue shall not be used in the establishment of temporary or permanent groundcover within riparian areas. For the establishment of permanent herbaceous cover, erosion control matting shall be used in conjunction with an appropriate native seed mix on disturbed soils within the riparian area and on disturbed steep slopes with the following exception. Erosion control matting is not necessary if the area is contained by perimeter erosion control devices such as silt fence, temporary sediment ditches, basins, etc. Matting should be secured in place with staples, stakes, or wherever possible, live stakes of native trees. Erosion control matting placed in riparian areas shall not contain a nylon mesh grid, which can impinge and entrap small animals. For the establishment of temporary groundcover within riparian areas, hydroseeding along with wood or cellulose based hydro mulch applied from a fertilizer- and limestone-free tank is allowable at the appropriate rate in conjunction with the erosion control measures. Discharging hydroseed mixtures and wood or cellulose mulch into surface waters in prohibited. Riparian areas are defined as a distance 25 feet landward from top of stream bank.

38. 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.

39. Sediment and erosion control measures shall not be placed in wetlands or surface waters, or within 5 feet of the top of bank, without prior approval from DWR. [15A NCAC 02H.0506(b)(3) and (c)(3)]

40. 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)

41. 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)]

42. 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)]

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. Please be aware that impacting waters without first applying for and securing the issuance of a 401

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Water Quality Certification violates Title 15A of the North Carolina Administrative Code (NCAC) 2H .0500. Title 15A NCAC 2H .0500 requires certifications pursuant to Section 401 of the Clean Water Act whenever construction or operation of facilities will result in a discharge into navigable waters, including wetlands, as described in 33 Code of Federal Regulations (CFR) Part 323. It also states any person desiring issuance of the State certification or coverage under a general certification required by Section 401 of the Federal Water Pollution Control Act shall file with the Director of the North Carolina Division of Water Quality. Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. Pursuant to G.S. 143-215.6A, these violations and any future violations are subject to a civil penalty assessment of up to a maximum of $25,000.00 per day for each violation.

This approval and its conditions are final and binding unless contested [G.S. 143-215.5]. Please be aware that impacting waters without first applying for and securing the issuance of a 401 Water Quality Certification violates Title 15A of the North Carolina Administrative Code (NCAC) 2H .0500. Title 15A NCAC 2H .0500 requires certifications pursuant to Section 401 of the Clean Water Act whenever construction or operation of facilities will result in a discharge into navigable waters, including wetlands, as described in 33 Code of Federal Regulations (CFR) Part 323. It also states any person desiring issuance of the State certification or coverage under a general certification required by Section 401 of the Federal Water Pollution Control Act shall file with the Director of the North Carolina Division of Water Quality. Pursuant to G.S. 143-215.6A, these violations and any future violations are subject to a civil penalty assessment of up to a maximum of $25,000.00 per day for each violation.

This Certification can be contested as provided in Chapter 150B of the North Carolina General Statutes by filing a Petition for a Contested Case Hearing (Petition) with the North Carolina Office of Administrative Hearings (OAH) within sixty (60) calendar days. Requirements for filing a Petition are set forth in Chapter 150B of the North Carolina General Statutes and Title 26 of the North Carolina Administrative Code. Additional information regarding requirements for filing a Petition and Petition forms may be accessed at http://www.ncoah.com/ or by calling the OAH Clerk's Office at (919) 431-3000.

A party filing a Petition must serve a copy of the Petition on:

William F. Lane, General Counsel
Department of Environmental Quality
1601 Mail Service Center
Raleigh, NC 27699-1601

If the party filing the Petition is not the permittee, then the party must also serve the recipient of the Certification in accordance with N.C.G.S 150B-23(a).

This the 8th day of April 2022

DIVISION OF WATER RESOURCES

DocuSigned by:
Amy Chapman
9C9886312DCD474...

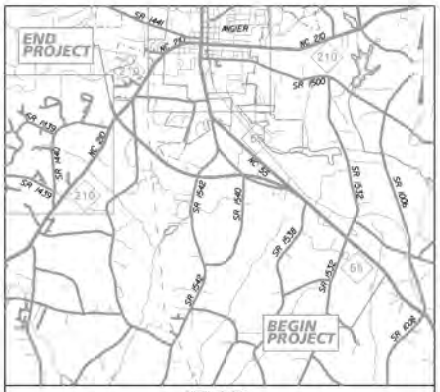
Richard E. Rogers, Jr., Director

WQC No. 004710

Submitted 3/1/2022

TIP PROJECT: R-5705A

See Sheet 1B For Conventional Plan Sheet Symbols



ROW PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HARNETT COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5705A	1	

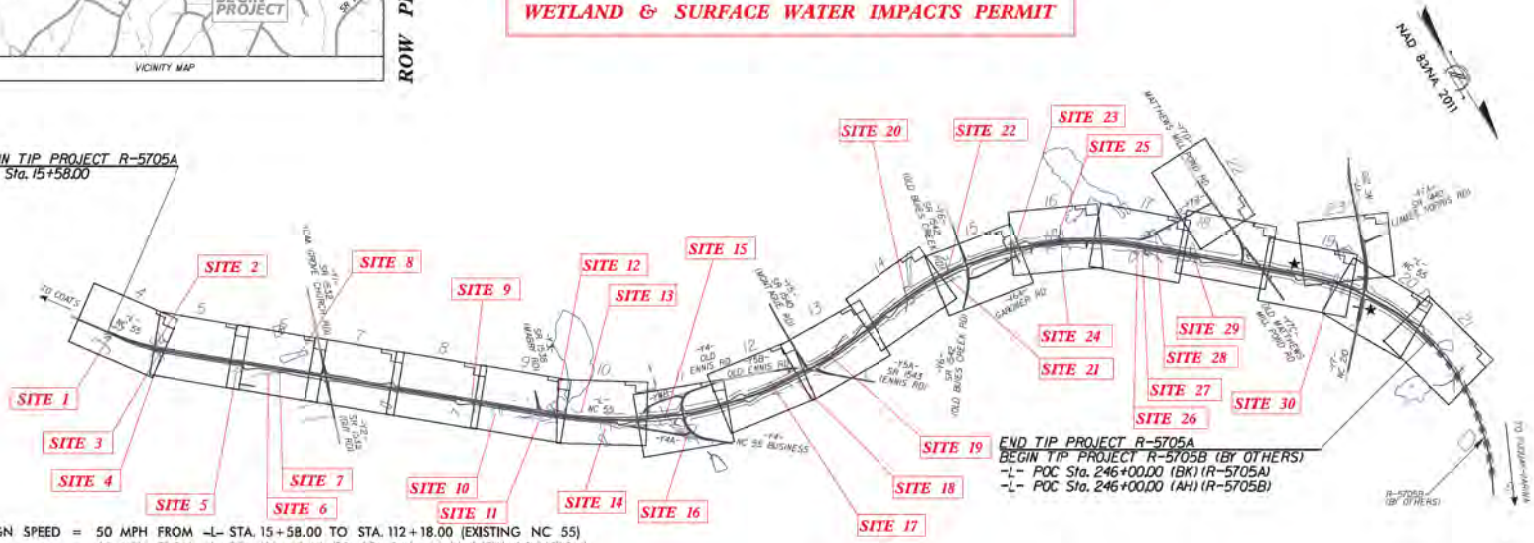
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
46377.1.2		P.E.
46377.2.1		RIGHT-OF-WAY
46377.2.5		UTILITIES

PERMIT DRAWING
SHEET 1 OF 64

LOCATION: NC 55 FROM SOUTH OF SR 1532 (OAK GROVE CHURCH ROAD) TO NORTH OF NC 210

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS AND CULVERTS

WETLAND & SURFACE WATER IMPACTS PERMIT



** DESIGN SPEED = 50 MPH FROM -L- STA. 15+58.00 TO STA. 112+18.00 (EXISTING NC 55)
60 MPH FROM -L- STA. 112+18.00 TO STA. 246+00.00 (NEW LOCATION)

★ TRAFFIC SIGNAL

THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE DRIVEWAY PER PARCEL AND FULL-CONTROL AT U-TURN BULBS
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT:

GRAPHIC SCALES

50 25 0 50 100 PLANS

50 25 0 50 100 PROFILE (HORIZONTAL)

5 2.5 0 5 10 PROFILE (VERTICAL)

DESIGN DATA

AADT 2022 = 15,900
AADT 2045 = 27,100
K = 9%
D = 60%
T = 4%*
** V = 50/60 MPH
* (TTST 1% + DUAL 3%)
FUNCTIONAL CLASSIFICATION: MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-5705A = 4.364 MILES

PLANS PREPARED FOR THE NCDOT BY: Kimley»Horn

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 9, 2021

LETTING DATE: MARCH 2023

JEFFREY W. MOORE, P.E. — PROJECT ENGINEER
EVERETT J. LOVING, P.E. — PROJECT DESIGN ENGINEER
NICOLE M. HACKLER, P.E. — SENIOR PROJECT MANAGER, NCDOT PROJECT MANAGEMENT UNIT

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

PERMIT REVISIONS: SITES 31, 32, AND 33 HAVE BEEN REMOVED

2/24/2022 WFILES

Submitted 3/1/2022

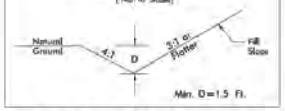
Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068

PROJECT REFERENCE NO.	SHEET NO.
R-5705A	20-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 2 OF 64

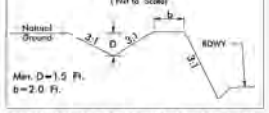
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



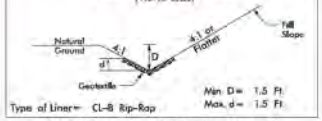
FROM STA. 21+00 TO STA. 23+00 -L- RT
FROM STA. 26+85 TO STA. 28+75 -L- LT
FROM STA. 26+70 TO STA. 31+00 -L- RT
FROM STA. 53+50 TO STA. 59+30 -L- RT
FROM STA. 53+09 TO STA. 57+00 -L- LT
FROM STA. 63+30 TO STA. 64+81 -L- RT
FROM STA. 68+50 TO STA. 72+50 -L- RT
FROM STA. 76+00 TO STA. 77+20 -L- RT
FROM STA. 74+50 TO STA. 76+75 -L- LT
FROM STA. 78+50 TO STA. 80+50 -L- RT
FROM STA. 91+50 TO STA. 94+50 -L- RT
FROM STA. 93+00 TO STA. 96+00 -L- LT
FROM STA. 104+50 TO STA. 109+50 -L- RT
FROM STA. 108+40 TO STA. 110+00 -L- LT
FROM STA. 123+18 TO STA. 124+85 -L- LT
FROM STA. 132+50 TO STA. 133+50 -L- LT
FROM STA. 133+00 TO STA. 134+80 -L- RT
FROM STA. 134+58 TO STA. 140+00 -L- LT
FROM STA. 136+20 TO STA. 142+50 -L- RT
FROM STA. 151+00 TO STA. 153+20 -L- LT
FROM STA. 164+00 TO STA. 164+80 -L- RT
FROM STA. 178+50 TO STA. 180+50 -L- RT
FROM STA. 182+50 TO STA. 186+20 -L- LT
FROM STA. 198+25 TO STA. 201+50 -L- LT
FROM STA. 233+35 TO STA. 234+40 -L- LT
FROM STA. 233+90 TO STA. 235+00 -L- RT
FROM STA. 216+74 TO STA. 221+50 -L- RT
FROM STA. 224+50 TO STA. 227+30 -L- RT
FROM STA. 13+55 TO STA. 14+05 -Y1- LT
FROM STA. 10+70 TO STA. 13+50 -Y2- RT
FROM STA. 19+76 TO STA. 21+73 -Y5- LT
FROM STA. 13+50 TO STA. 15+40 -Y6- LT
FROM STA. 24+70 TO STA. 27+45 -Y7- RT
FROM STA. 29+00 TO STA. 31+95 -Y7- LT

DETAIL 3
BERM 'V' DITCH
(Not to Scale)



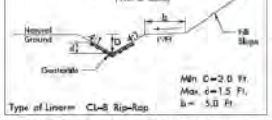
FROM STA. 16+28 TO STA. 17+55 -L- RT
FROM STA. 186+50 TO STA. 188+70 -L- RT
FROM STA. 190+00 TO STA. 190+50 -L- RT

DETAIL 4
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



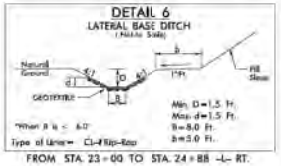
FROM STA. 90+50 TO STA. 91+50 -L- RT
FROM STA. 27+45 TO STA. 29+00 -Y7- LT

DETAIL 5
LATERAL 'V' DITCH
(Not to Scale)



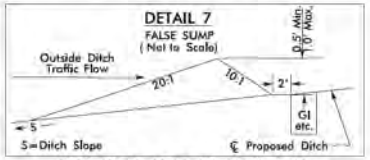
FROM STA. 24+06 TO STA. 26+38 -L- LT.

DETAIL 6
LATERAL BASE DITCH
(Not to Scale)



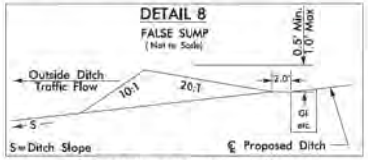
FROM STA. 23+00 TO STA. 24+88 -L- RT.

DETAIL 7
FALSE SUMP
(Not to Scale)



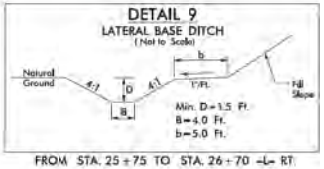
FROM STA. 47+33 TO STA. 47+48 -L- RT
FROM STA. 51+40 TO STA. 51+55 -L- RT
FROM STA. 50+00 TO STA. 50+15 -L- RT
FROM STA. 81+54 TO STA. 81+69 -L- LT
FROM STA. 83+54 TO STA. 83+69 -L- LT
FROM STA. 84+02 TO STA. 84+17 -L- LT
FROM STA. 86+04 TO STA. 86+19 -L- LT
FROM STA. 183+83 TO STA. 183+98 -L- RT

DETAIL 8
FALSE SUMP
(Not to Scale)



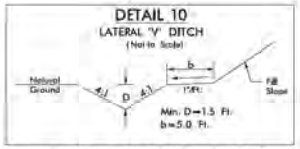
FROM STA. 192+53 TO STA. 192+68 -L- RT
FROM STA. 194+52 TO STA. 194+67 -L- RT
FROM STA. 207+33 TO STA. 207+48 -L- LT
FROM STA. 204+83 TO STA. 204+98 -L- LT
FROM STA. 11+24 TO STA. 11+39 -Y2- LT
FROM STA. 12+00 TO STA. 12+15 -Y2- LT

DETAIL 9
LATERAL BASE DITCH
(Not to Scale)



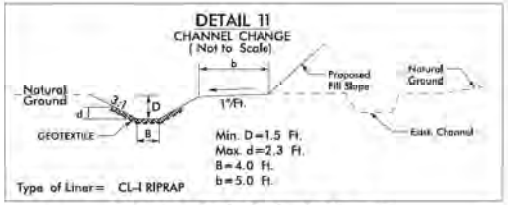
FROM STA. 25+75 TO STA. 26+70 -L- RT.

DETAIL 10
LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 153+20 TO STA. 154+75 -L- RT.

DETAIL 11
CHANNEL CHANGE
(Not to Scale)



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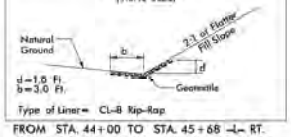
DETAIL 12
TOE PROTECTION
(Not to Scale)

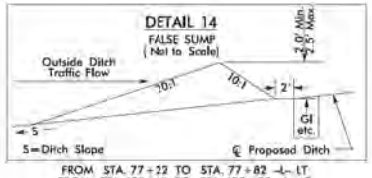


FROM STA. 44+00 TO STA. 45+68 -L- RT.
FROM STA. 161+07 TO STA. 162+43 -L- LT
FROM STA. 196+65 TO STA. 197+50 -L- RT
FROM STA. 227+95 TO STA. 230+45 -L- RT

DETAIL 13
SPECIAL LATERAL BASE DITCH
(Not to Scale)

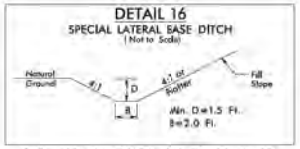
FROM STA. 72+00 TO STA. 73+02 -L- LT.

DETAIL 14
FALSE SUMP
(Not to Scale)



FROM STA. 77+22 TO STA. 77+82 -L- LT
FROM STA. 122+18 TO STA. 122+78 -L- LT
FROM STA. 124+85 TO STA. 125+45 -L- LT
FROM STA. 126+80 TO STA. 126+60 -L- LT

DETAIL 16
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 72+50 TO STA. 73+25 -L- RT
FROM STA. 151+50 TO STA. 153+75 -L- RT
FROM STA. 154+05 TO STA. 156+50 -L- RT
FROM STA. 178+00 TO STA. 179+00 -L- LT

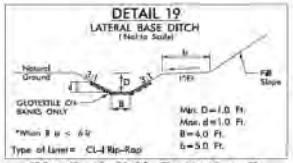
DETAIL 17
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 82+50 TO STA. 85+00 -L- LT.
FROM STA. 146+50 TO STA. 148+50 -L- LT

DETAIL 18
TOE PROTECTION
(Not to Scale)

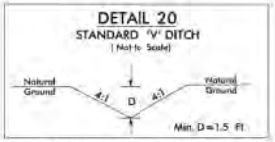
FROM STA. 88+15 TO STA. 90+40 -L- RT.
FROM STA. 90+48 TO STA. 90+58 -L- RT.

DETAIL 19
LATERAL BASE DITCH
(Not to Scale)



FROM STA. 85+50 TO STA. 88+05 -L- RT

DETAIL 20
STANDARD 'V' DITCH
(Not to Scale)



FROM STA. 100+25 TO 101+50 -L- RT
AT STA. 64+81 RT

DETAIL 21
SPECIAL CUT DITCH
(Not to Scale)

FROM STA. 103+50 TO STA. 104+50 -L- RT
FROM STA. 159+50 TO STA. 160+50 -L- RT
FROM STA. 177+50 TO STA. 178+50 -L- RT
FROM STA. 209+65 TO STA. 211+00 -L- RT
FROM STA. 23+50 TO STA. 24+50 -Y4- LT
FROM STA. 10+30 TO STA. 11+00 -Y6A- RT
FROM STA. 34+00 TO STA. 36+00 -Y7- LT

P-28

Submitted 3/1/2022

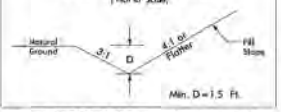
Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068

PROJECT REFERENCE NO.	SHEET NO.
R-5705A	20-B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

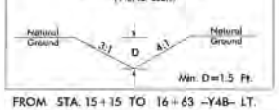
PERMIT DRAWING
SHEET 3 OF 64

DETAIL 22
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



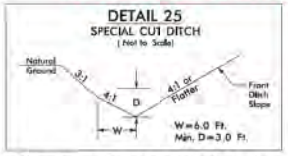
FROM STA. 130+09 TO STA. 132+50 -L- LT
FROM STA. 10+88 TO STA. 12+85 -Y3- RT
FROM STA. 10+88 TO STA. 12+95 -Y3- LT
FROM STA. 13+13 TO STA. 15+00 -Y4- LT
FROM STA. 16+00 TO STA. 16+63 -Y4B- LT
FROM STA. 10+65 TO STA. 13+50 -Y5A- RT
FROM STA. 17+65 TO STA. 22+44 -Y6- RT
FROM STA. 17+50 TO STA. 22+00 -Y6- LT

DETAIL 23
STANDARD 'V' DITCH
(Not to Scale)



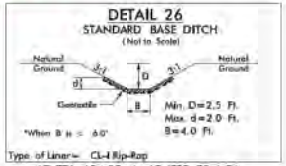
FROM STA. 15+15 TO 16+63 -Y4B- LT.

DETAIL 25
SPECIAL CUT DITCH
(Not to Scale)



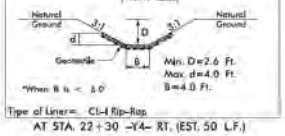
FROM STA. 112+85 TO STA. 118+75 -L- LT.
FROM STA. 121+00 TO STA. 123+18 -L- LT.
FROM STA. 190+00 TO STA. 192+50 -L- RT.
FROM STA. 211+00 TO STA. 212+00 -L- RT.

DETAIL 26
STANDARD BASE DITCH
(Not to Scale)



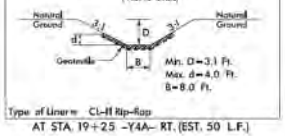
AT STA. 45+00 -L- LT (EST. 70 L.F.)
AT STA. 108+30 -L- LT (EST. 90 L.F.)

DETAIL 27
STANDARD BASE DITCH
(Not to Scale)



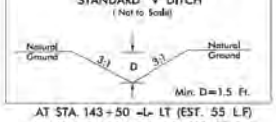
AT STA. 22+30 -Y4- RT. (EST. 50 L.F.)

DETAIL 28
STANDARD BASE DITCH
(Not to Scale)



AT STA. 19+25 -Y4A- RT. (EST. 50 L.F.)

DETAIL 29
STANDARD 'V' DITCH
(Not to Scale)

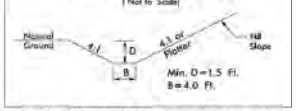


AT STA. 143+50 -L- LT (EST. 55 L.F)
AT STA. 18+50 -Y6A- LT (EST. 50 L.F)

DETAIL 30
SPECIAL CUT DITCH
(Not to Scale)

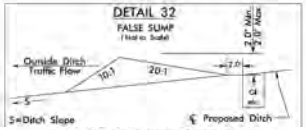
FROM STA. 145+50 TO STA. 146+50 -L- LT.

DETAIL 31
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 45+00 TO STA. 46+00 -L- LT
FROM STA. 92+25 TO STA. 93+00 -L- LT
FROM STA. 160+50 TO STA. 161+80 -L- RT
FROM STA. 161+80 TO STA. 164+00 -L- RT
FROM STA. 173+00 TO STA. 173+65 -L- RT
FROM STA. 202+50 TO STA. 203+80 -L- LT
FROM STA. 203+80 TO STA. 205+00 -L- LT
FROM STA. 10+50 TO STA. 13+15 -Y1- LT
FROM STA. 22+00 TO STA. 23+50 -Y4- LT

DETAIL 32
FALSE SUMP
(Not to Scale)

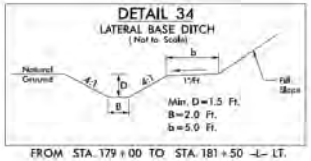


FROM STA. 17+15 TO STA.17+50 -Y6- LT

DETAIL 33
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

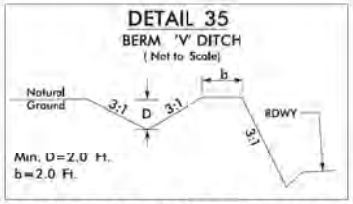
FROM STA. 166+10 TO STA. 170+00 -L- RT
FROM STA. 194+50 TO STA. 195+50 -L- RT

DETAIL 34
LATERAL BASE DITCH
(Not to Scale)



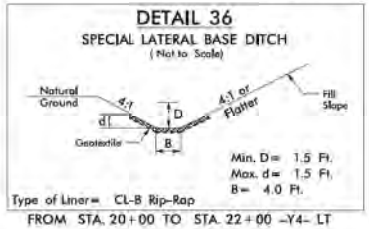
FROM STA. 179+00 TO STA. 181+50 -L- LT.

DETAIL 35
BERM 'V' DITCH
(Not to Scale)



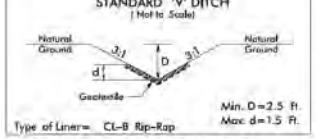
FROM STA. 190+50 TO STA. 192+50 -L- RT.

DETAIL 36
SPECIAL LATERAL BASE DITCH
(Not to Scale)



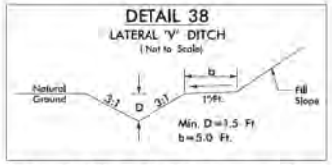
FROM STA. 20+00 TO STA. 22+00 -Y4- LT

DETAIL 37
STANDARD 'V' DITCH
(Not to Scale)



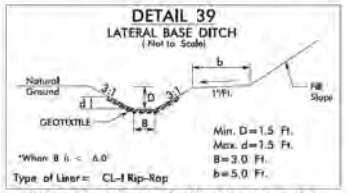
FROM -L- STA. 132+50 LT. TO
-Y5B- STA. 13+90 LT. (EST. 64 L.F.
HEAD DITCH THROUGH -Y5B-)

DETAIL 38
LATERAL 'V' DITCH
(Not to Scale)



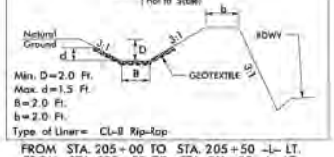
FROM STA. 132+10 TO STA. 133+00 -L- RT

DETAIL 39
LATERAL BASE DITCH
(Not to Scale)



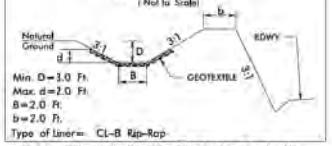
FROM STA. 197+50 TO STA. 198+90 -L- RT

DETAIL 40
BERM BASE DITCH
(Not to Scale)



FROM STA. 205+00 TO STA. 205+50 -L- LT.
FROM STA. 208+50 TO STA. 211+30 -L- LT

DETAIL 41
BERM BASE DITCH
(Not to Scale)



FROM STA. 207+50 TO STA. 208+50 -L- LT.

DETAIL 42
SPECIAL CUT DITCH
(Not to Scale)

FROM STA. 18+50 TO STA. 19+20 -L- RT
FROM STA. 18+50 TO STA. 19+20 -L- LT

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Submitted 3/1/2022

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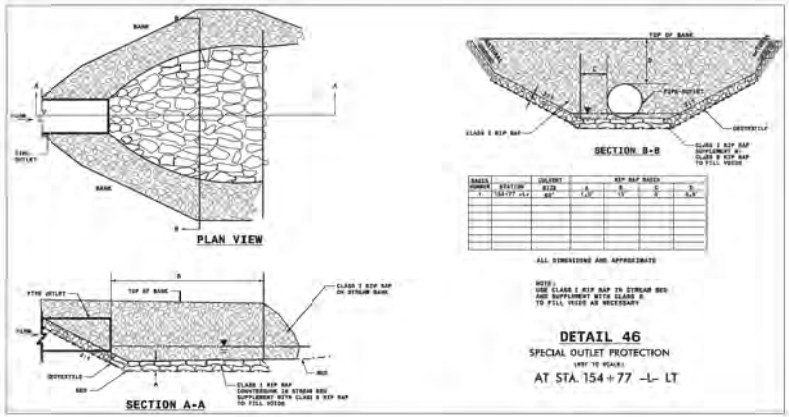
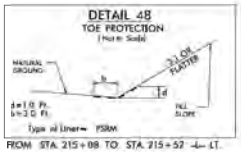
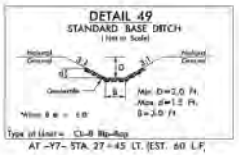
PROJECT REFERENCE NO.	SHEET NO.
R-5705A	20-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

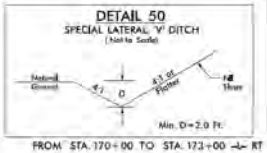
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

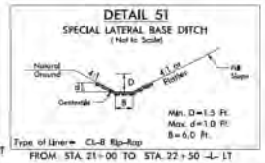
PERMIT DRAWING
SHEET 4 OF 64

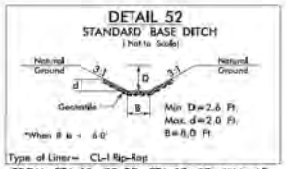


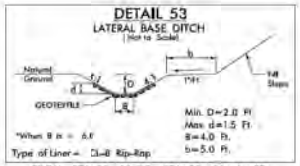


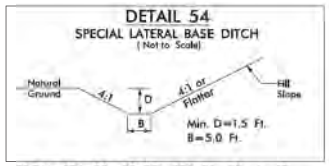


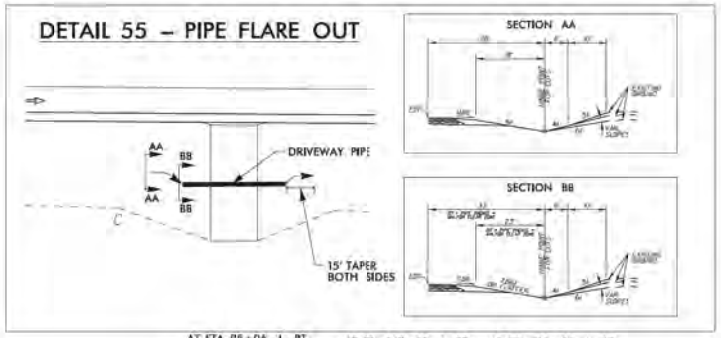


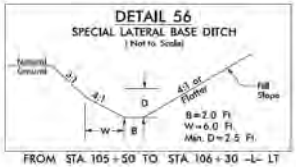












12/30/2021

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Submitted 3/1/2022

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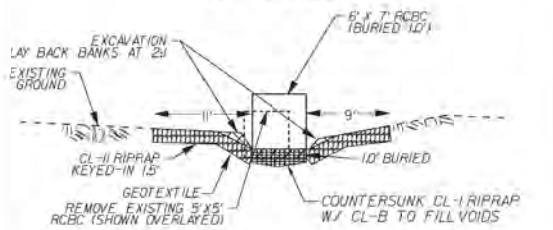
PROJECT REFERENCE NO.	SHEET NO.
R-5705A	20-m
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

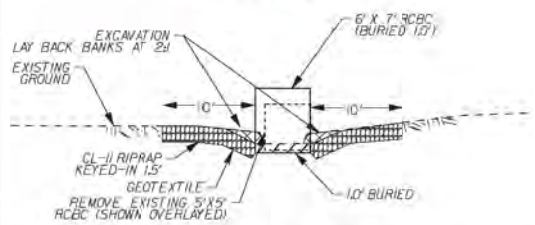
PERMIT DRAWING
SHEET 5 OF 64

DETAIL 58 TYPICAL OUTLET CHANNEL IMPROVEMENTS LOOKING DOWNSTREAM NOT TO SCALE



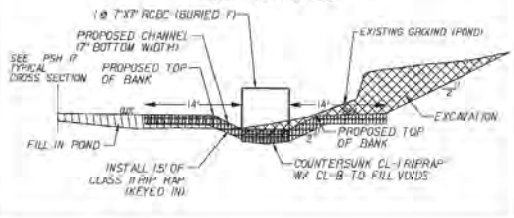
APPROX. STA. 24+10 -L- LT

DETAIL 59 TYPICAL - INLET CHANNEL IMPROVEMENTS LOOKING DOWNSTREAM NOT TO SCALE

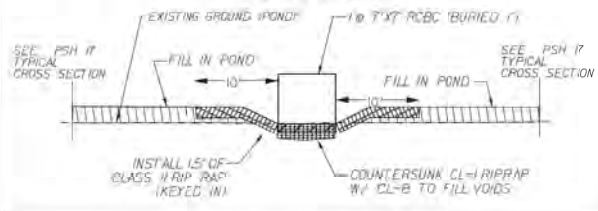


APPROX. STA. 24+70 TO 25+00 -L- RT

DETAIL 60 TYPICAL OUTLET CHANNEL IMPROVEMENTS LOOKING DOWNSTREAM NOT TO SCALE



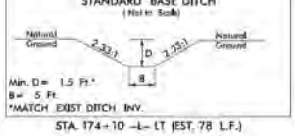
DETAIL 61 TYPICAL - INLET CHANNEL IMPROVEMENTS LOOKING DOWNSTREAM NOT TO SCALE



DETAIL 62
STANDARD BASE DITCH
(Not to Scale)

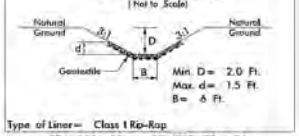
FROM STA. 86+50 TO STA. 86+87 -L- RT

DETAIL 63
STANDARD BASE DITCH
(Not to Scale)



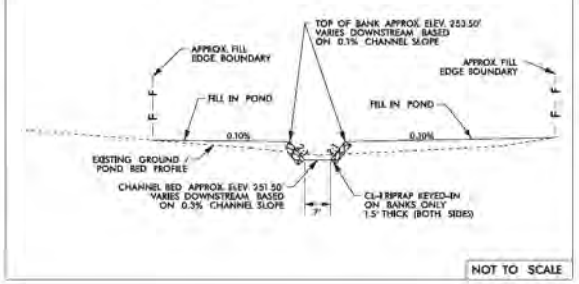
STA. 174+10 -L- LT (EST. 78 L.F.)

DETAIL 64
STANDARD BASE DITCH
(Not to Scale)



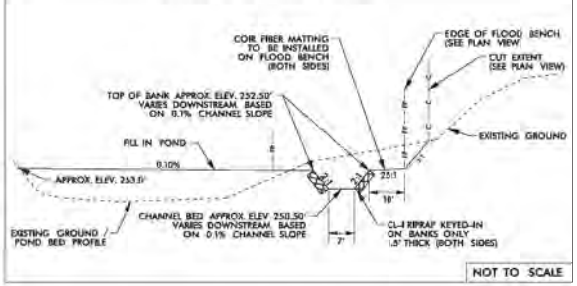
STA. 162+53 -L- LT (EST. 73 L.F.)

DETAIL TYPICAL SECTION P1



NOT TO SCALE

DETAIL TYPICAL SECTION P2



NOT TO SCALE

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Submitted 3/1/2022

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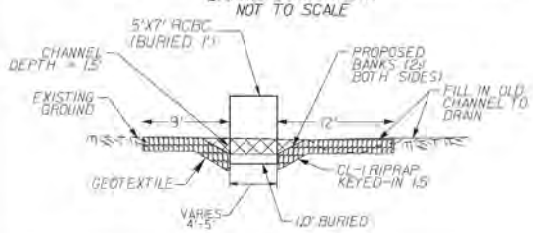
PROJECT REFERENCE NO.	SHEET NO.
R-5705A	20-5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

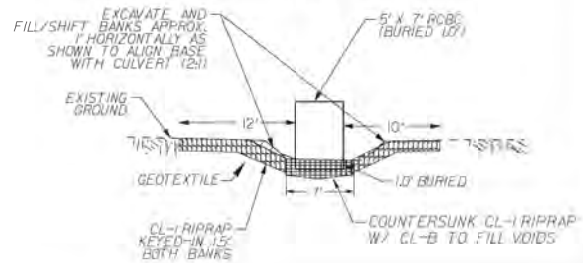
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 6 OF 64

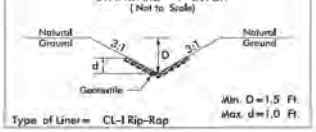
DETAIL 67 TYPICAL - INLET CHANNEL IMPROVEMENTS
LOOKING DOWNSTREAM
NOT TO SCALE



DETAIL 68 TYPICAL OUTLET CHANNEL IMPROVEMENTS
LOOKING DOWNSTREAM
NOT TO SCALE



DETAIL 69
STANDARD 'V' DITCH
(Not to Scale)



FROM STA. 20+80 TO STA. 23+30 -Y7B- LT
(EQUATES TO: -L- LT. STA. 195+00 TO STA. 197+26)

12/30/2021

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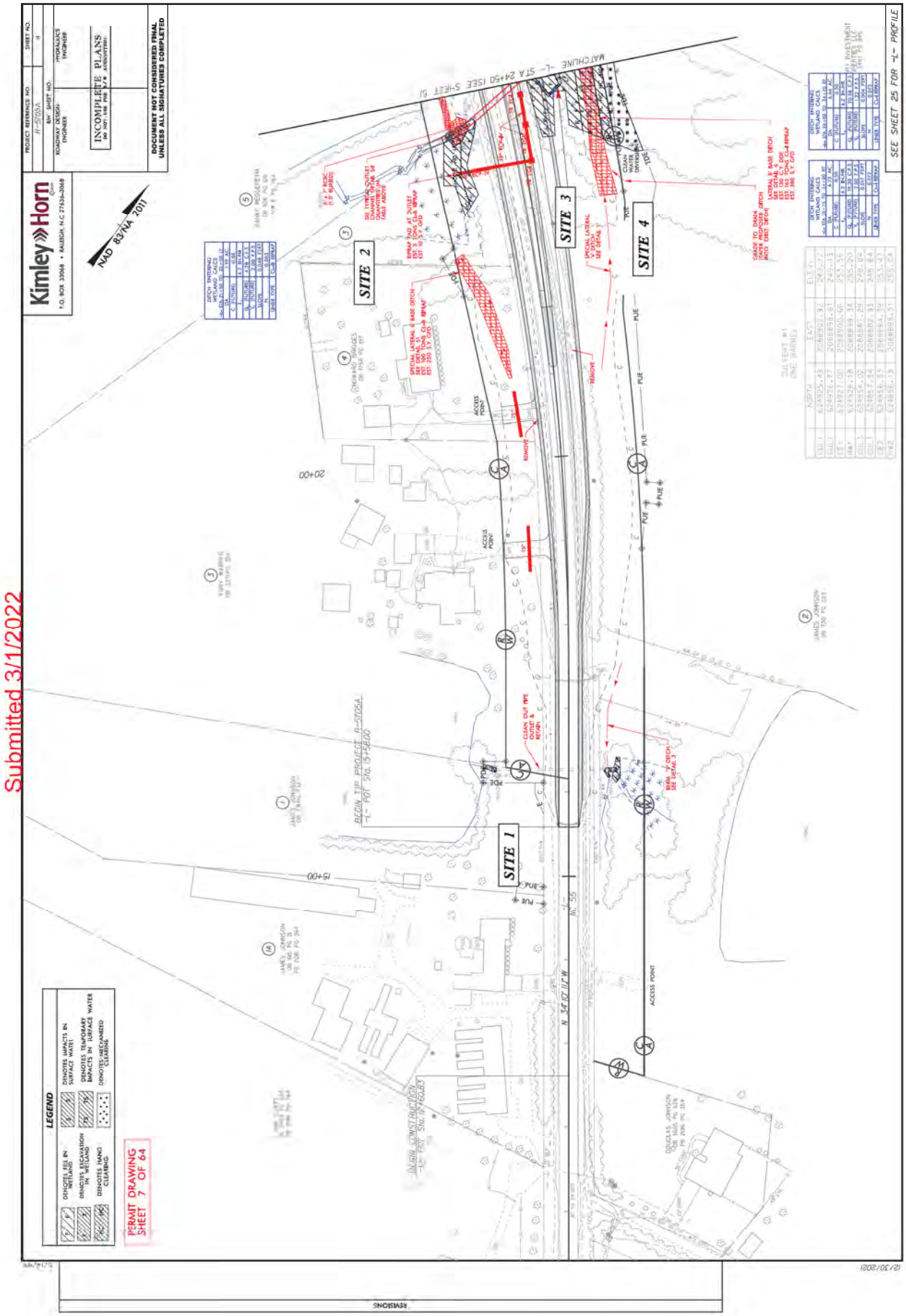
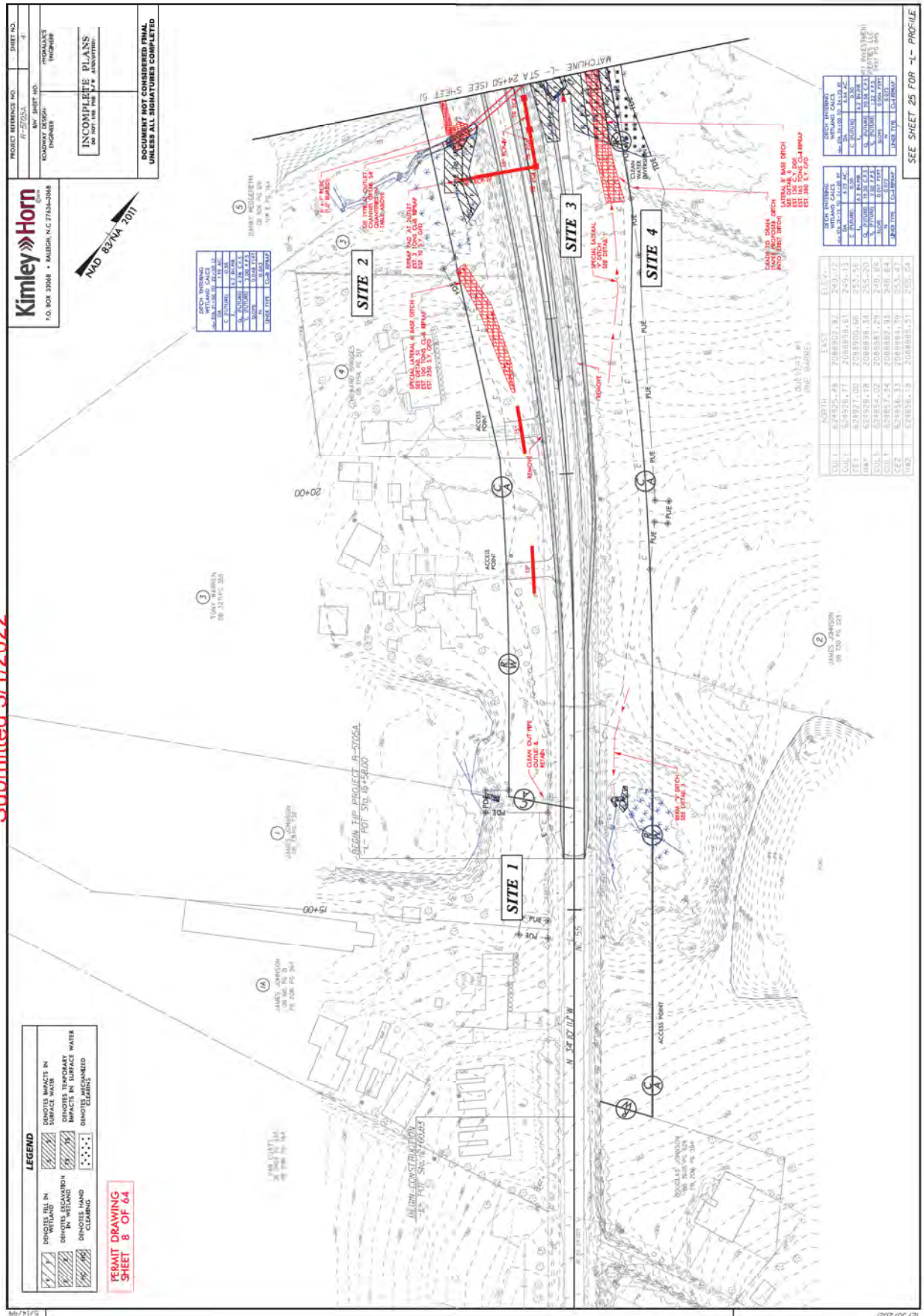
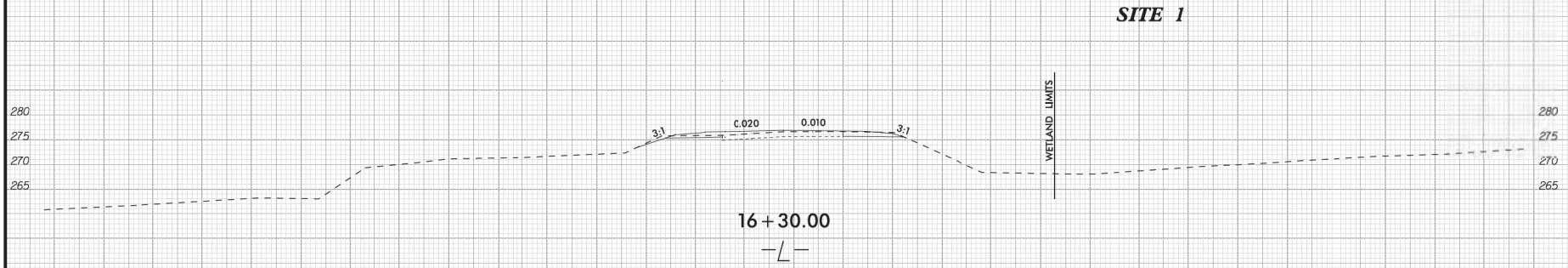

Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
PROJECT REFERENCE NO. R-5705A
SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
SITE 1
SITE 2
SITE 3
SITE 4
BEGIN TIP PROJECT R-5705A
-L- POT STA. 15+50.00
N. 34°07'11.4"W
NC 55
ACCESS POINT
REMOVE
CLEAN OUT PIPE & OUTLET & REPAIR
BERM -Y- DITCH SEE DETAIL 3
SEE SHEET 25 FOR -L- PROFILE
LEGEND
DENOTES FILL IN WETLAND
DENOTES EXCAVATION IN WETLAND
DENOTES HAND CLEARING
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
PERMIT DRAWING SHEET 7 OF 64
Submitted 3/1/2022
REVISIONS


Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
PROJECT REFERENCE NO. R-5705A
SHEET NO. 4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
SITE 1
SITE 2
SITE 3
SITE 4
SEE SHEET 25 FOR -L- PROFILE
LEGEND
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES EXCAVATION IN WETLAND
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES HAND CLEARING
DENOTES MECHANIZED CLEARING
PERMIT DRAWING SHEET 8 OF 64
BEGIN TIP PROJECT R-5705A
-L- POT Sta. 16+50.00
END TIP CONSTRUCTION
-L- POT Sta. 42+60.65
WATCHLINE -L- STA 24+50 (SEE SHEET 51)
N 34°07'11.8"W
ACCESS POINT
REMOVE
CLEAN OUT PIPE
REPAIR
SPECIAL LATERAL & BASE DITCH
EST 300 L.F. DOE
EST 340 TONS CLASS II RIPRAP
EST 7 TONS CLASS I RIPRAP
RIPRAP PAD AT OUTLET
CLEAN OUT DITCH
CLEAN OUT DRAIN
LATERAL & BASE DITCH
EST 130 L.F. DOE
EST 340 TONS CLASS II RIPRAP
EST 140 L.F. CD
DITCH ENTERING WETLAND CALCS
DITCH ENTERING WETLAND CALCS
NORTH
EAST
ELEV.
COLL 1 624925.48 2088907.32 249.72
COLL 2 624926.77 2088898.61 249.13
CE1 624927.00 2088900.56 253.56
HW1 624928.18 2088899.34 255.20
COLL 3 624854.02 2088887.29 248.06
COLL 1 624857.24 2088882.93 248.64
CE2 624856.33 2088884.79 253.47
HW2 624856.18 2088885.51 255.04
JAMES JOHNSON
DB 3030 PG 221
TONY BURNS
DB 3270 PG 325
DANNY ROGERSON
DB 3006 PG 676
DOUGLAS JOHNSON
DB 3015 PG 321
JAMES JOHNSON
DB 3030 PG 221
JAMES JOHNSON
DB 3030 PG 221
JAMES JOHNSON
DB 3030 PG 221

Submitted 3/1/2022

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 09 -

PERMIT DRAWING
SHEET 9 OF 64



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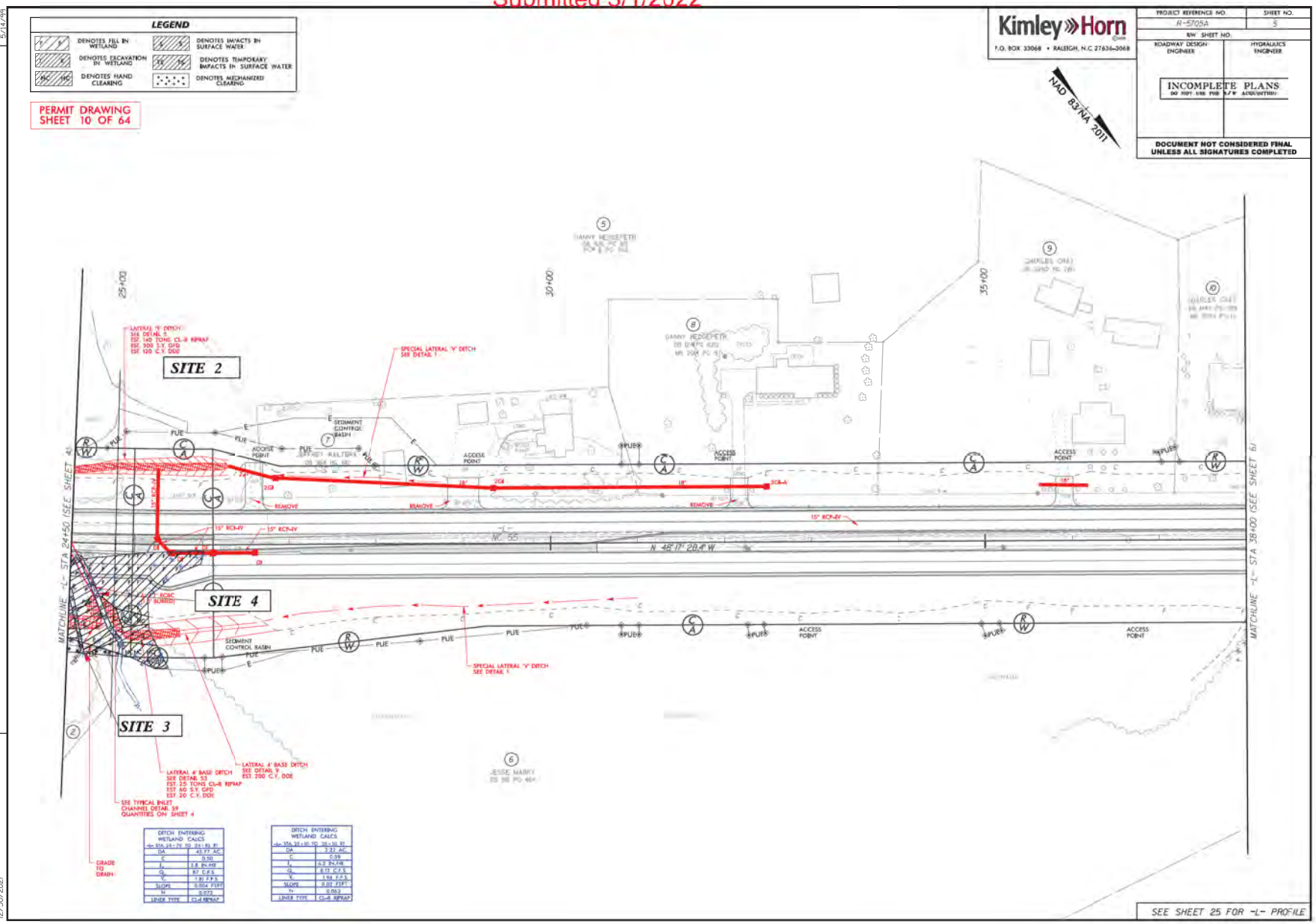

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LEGEND

- DENOTES FILL IN WETLAND
- DENOTES EXCAVATION IN WETLAND
- DENOTES HAND CLEARING
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING

PERMIT DRAWING
SHEET 11 OF 64

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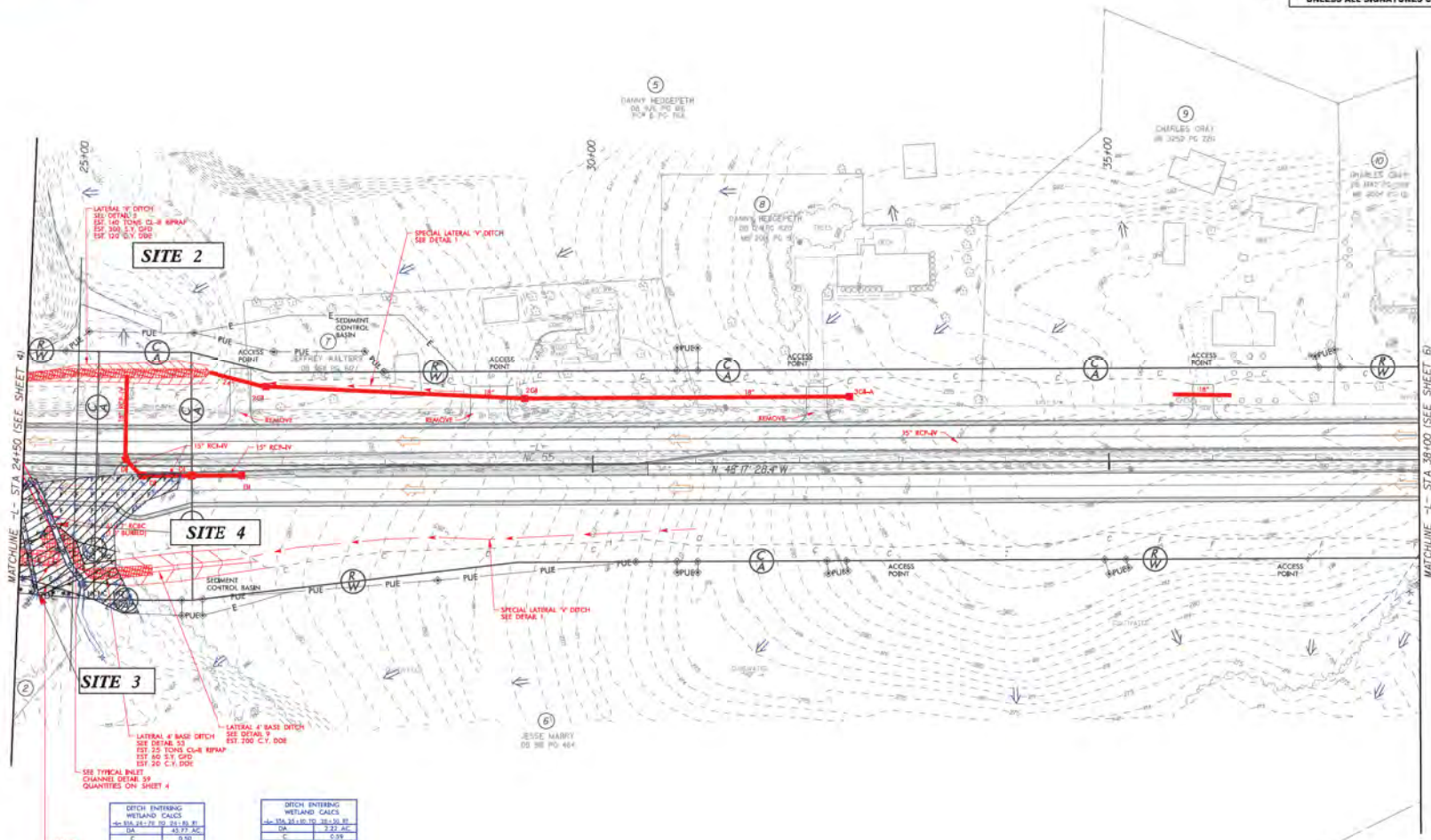
PROJECT REFERENCE NO.	SHEET NO.
R-5705A	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011



DITCH ENTERING WETLAND CALCS	
-L- STA. 24+70 TO 24+80, RT	
DA	45.77 AC
C	0.50
t_c	5.8 IN/HR
Q_{10}	87 C.F.S.
V_c	1.91 F.P.S.
SLOPE	0.004 FT/FT
N	0.072
LINER TYPE	CL-B RIPRAP

DITCH ENTERING WETLAND CALCS	
-L- STA. 25+10 TO 25+10, RT	
DA	2.32 AC
C	0.59
t_c	6.2 IN/HR
Q_{10}	8.13 C.F.S.
V_c	1.94 F.P.S.
SLOPE	0.02 FT/FT
N	0.063
LINER TYPE	CL-B RIPRAP

SEE SHEET 25 FOR -L- PROFILE

SHOREWOOD

12/30/2021

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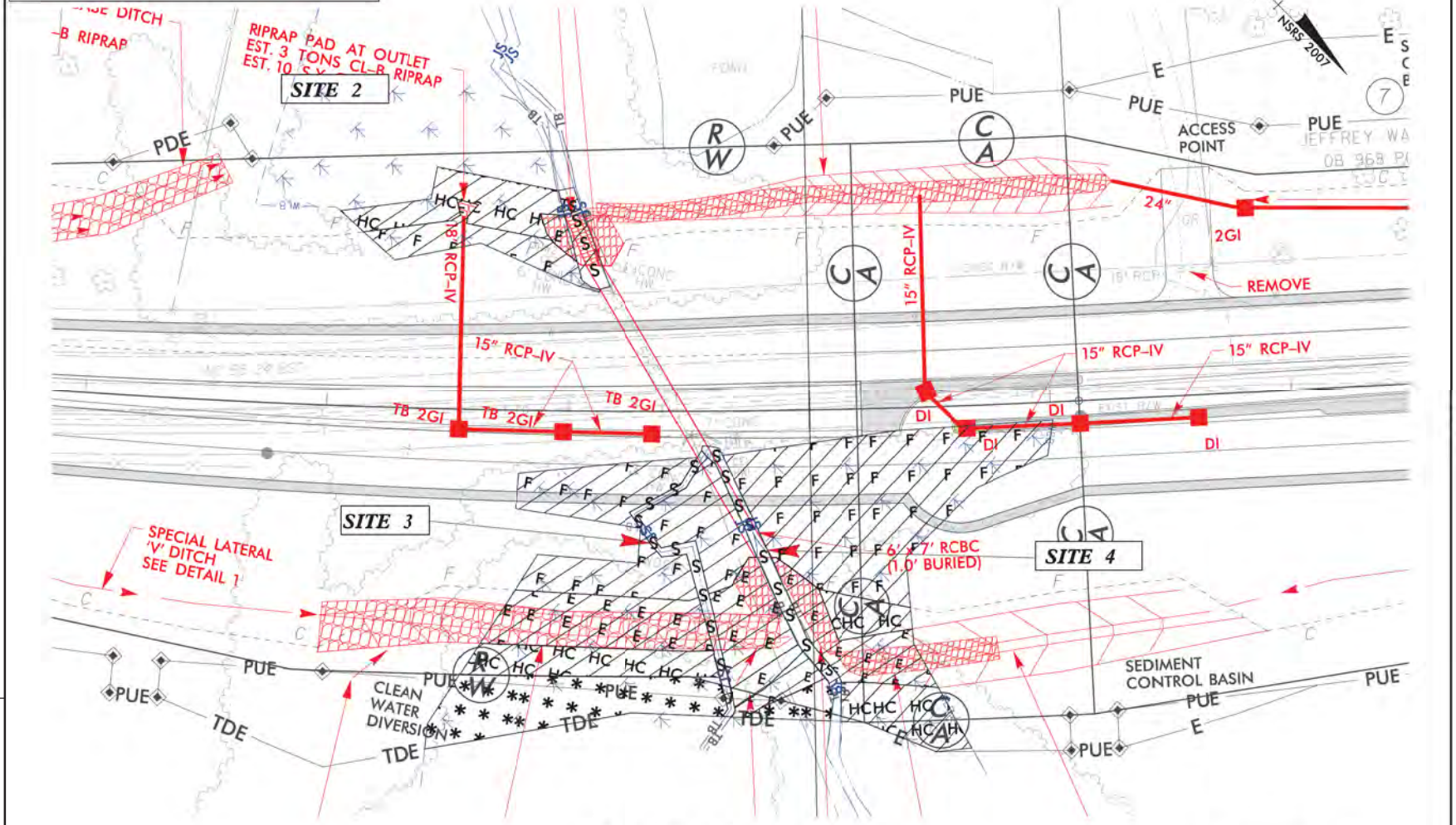
WETLAND AND STREAM IMPACTS
SITE IMPACT ZOOM: 1"=40'

PROJECT REFERENCE NO.	SHEET NO.
R-5705A	4A/5A

PERMIT DRAWING SHEET 12 OF 64

LEGEND

- DENOTES FILL IN WETLAND
- DENOTES EXCAVATION IN WETLAND
- DENOTES HAND CLEARING
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING



SITES 2,3,4

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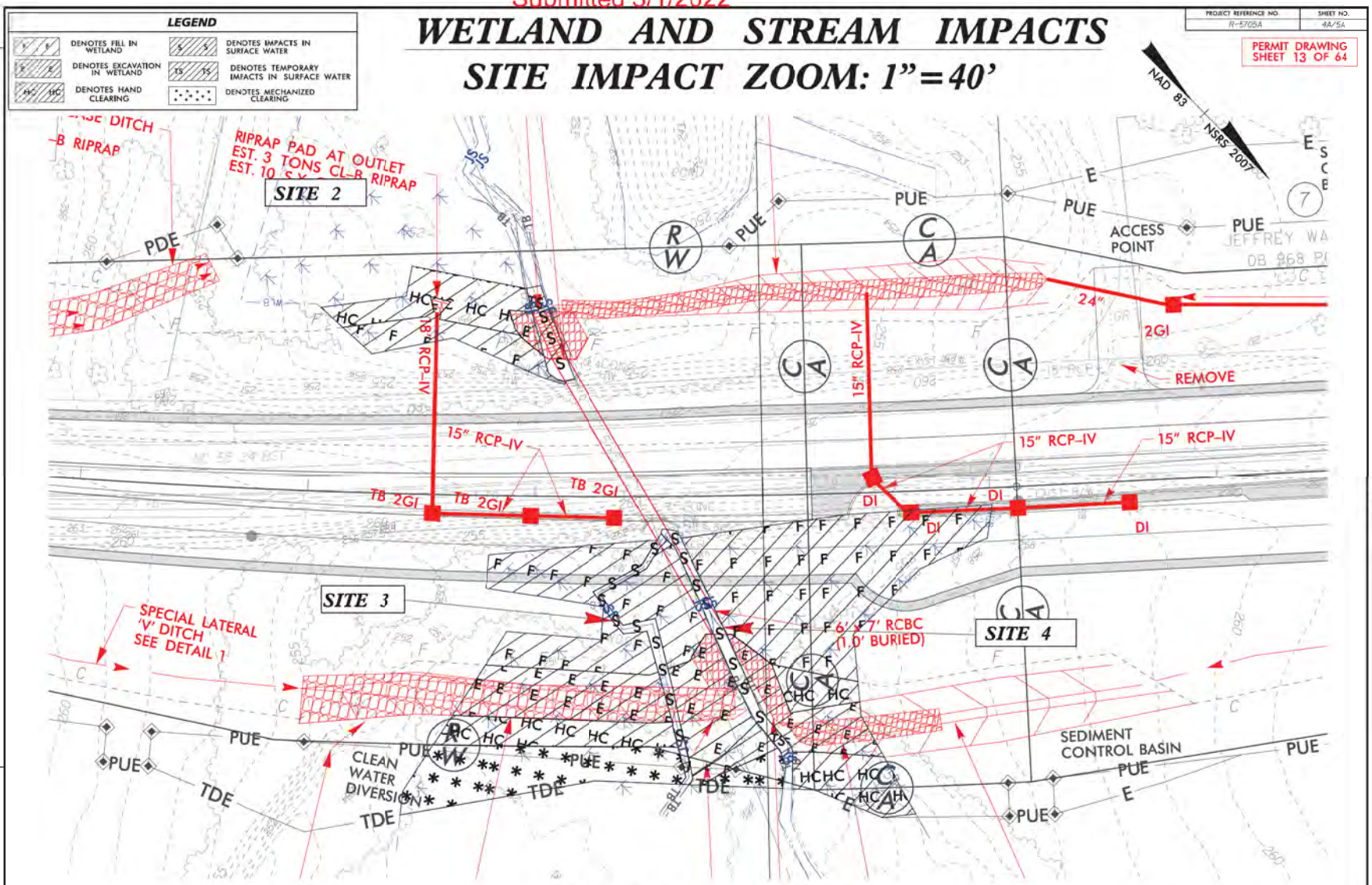
Submitted 3/1/2022



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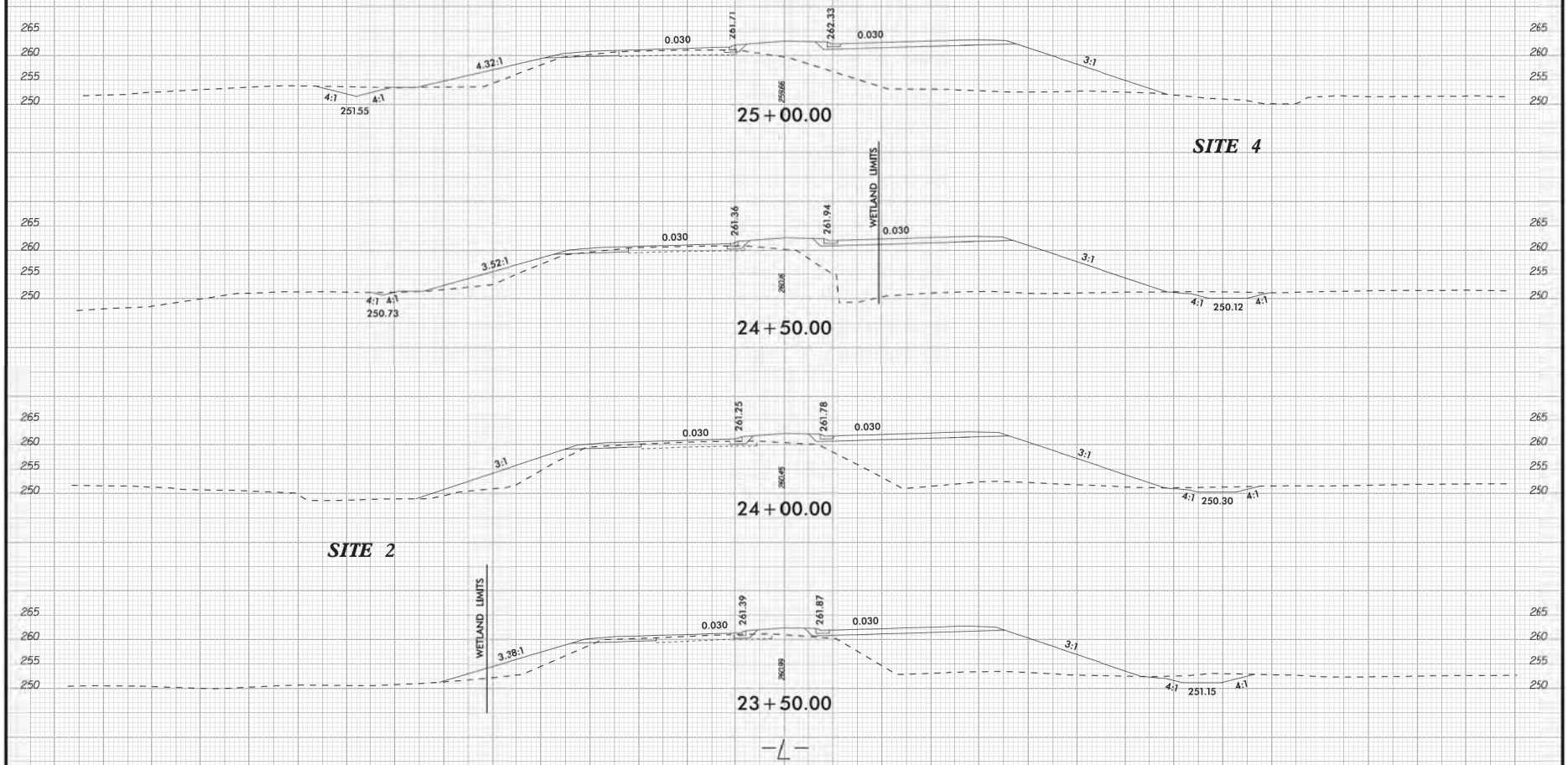
Submitted 3/1/2022

PERMIT DRAWING
SHEET 14 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



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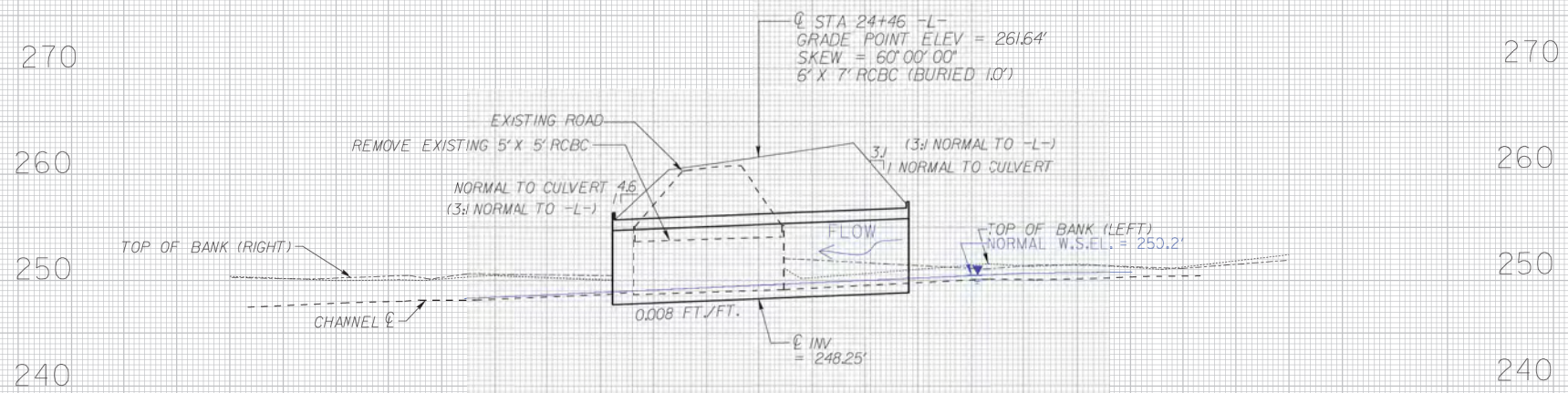
Submitted 3/1/2022

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -

PERMIT DRAWING
SHEET 15 OF 64

SITE 2,3,4



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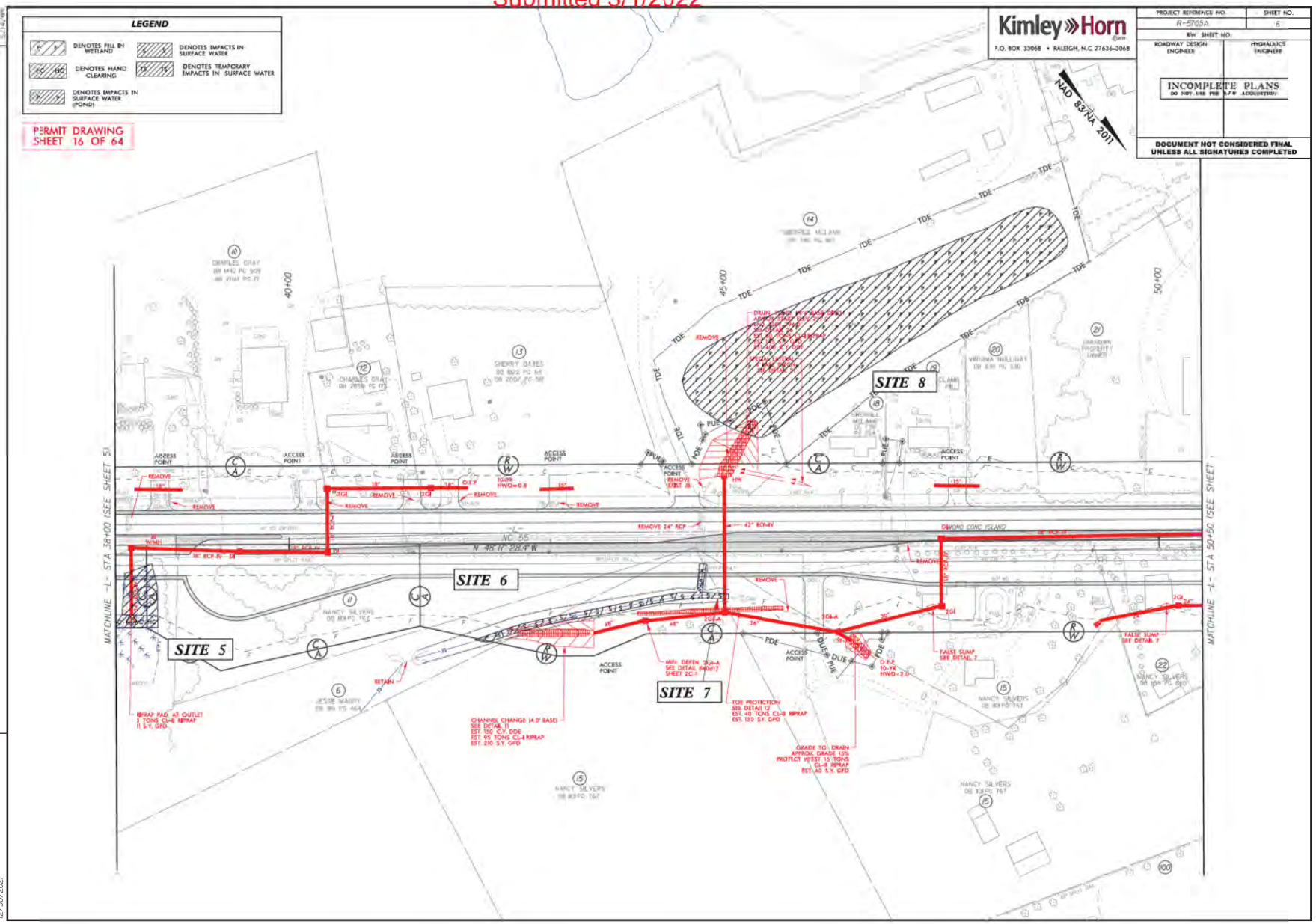
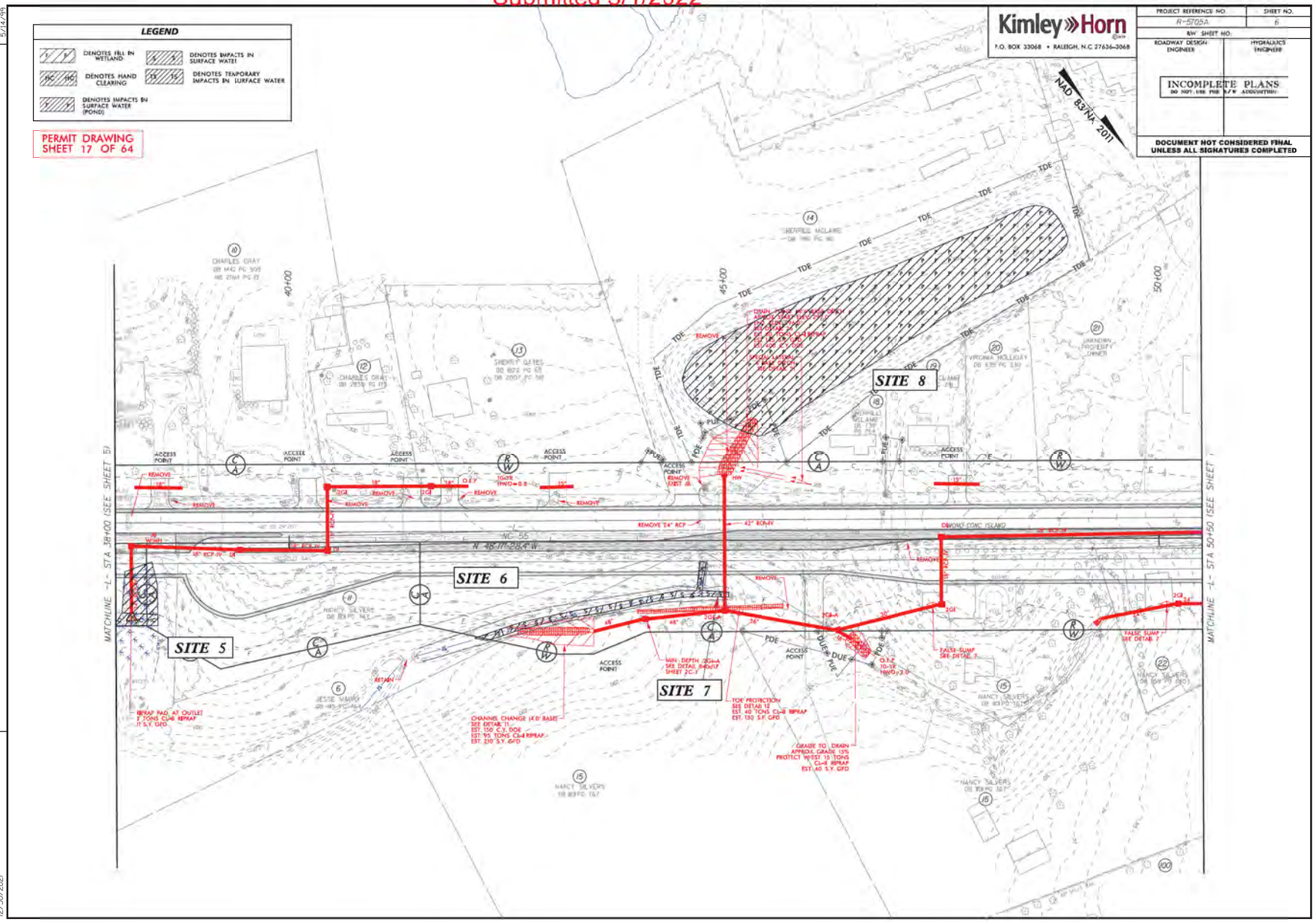
Submitted 3/1/2022



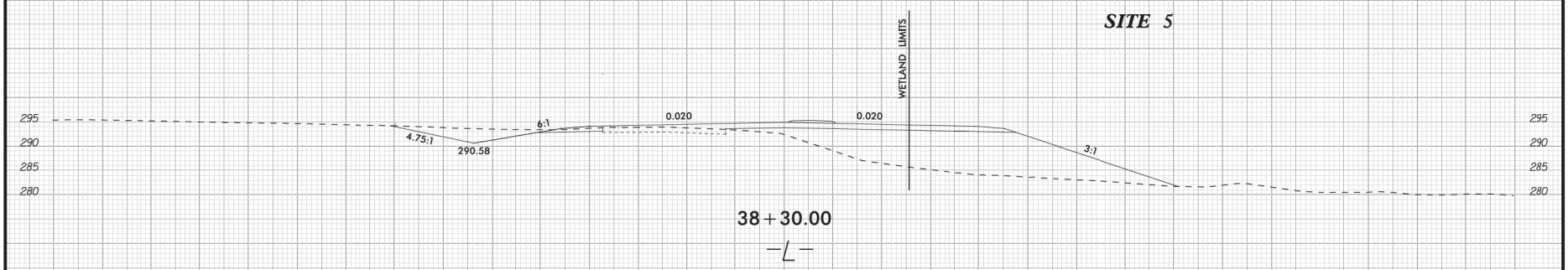
Submitted 3/1/2022



Submitted 3/1/2022

PERMIT DRAWING
SHEET 18 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



12/30/2021

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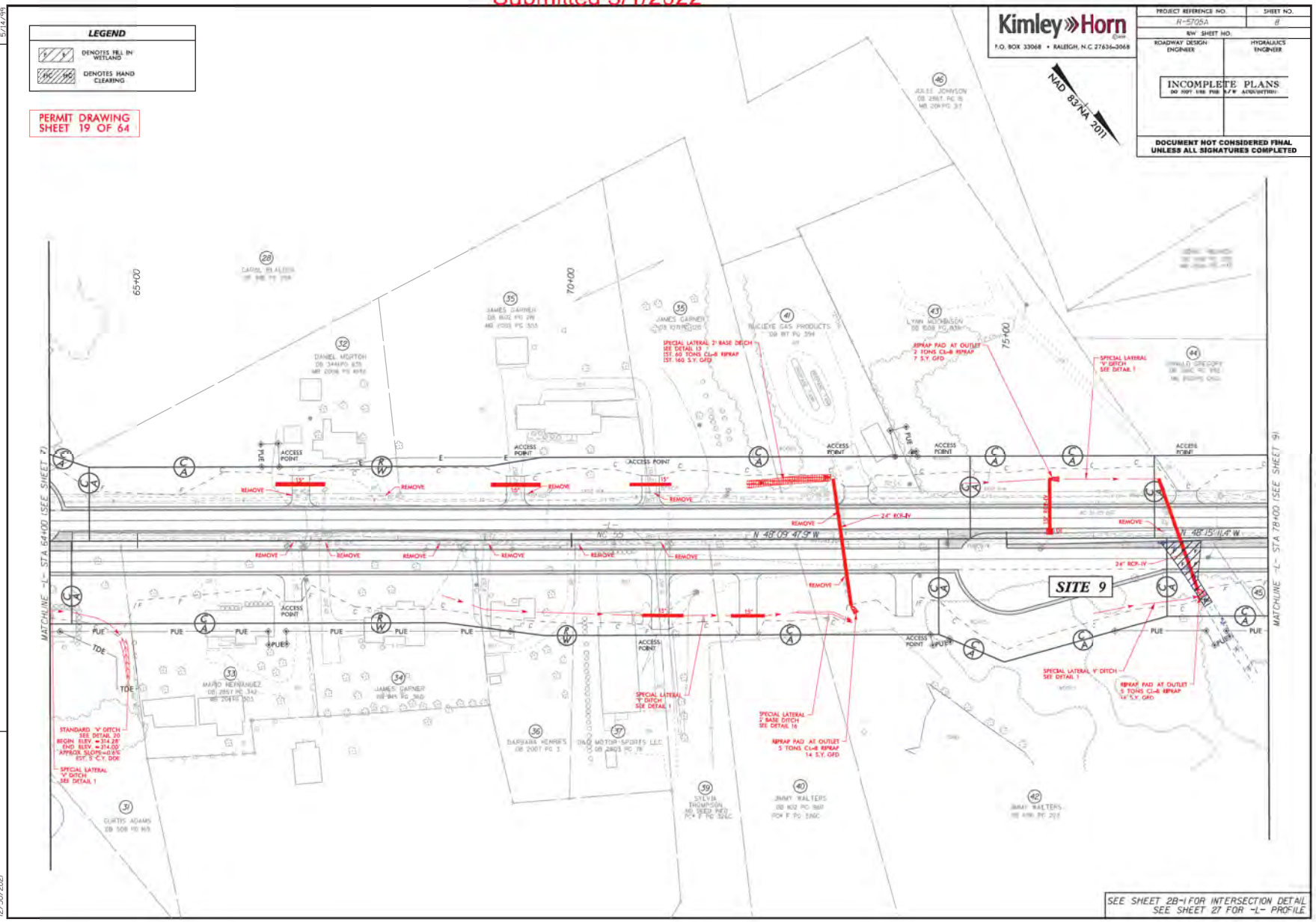
Submitted 3/1/2022



REVISIONS

5/14/99

12/30/2021

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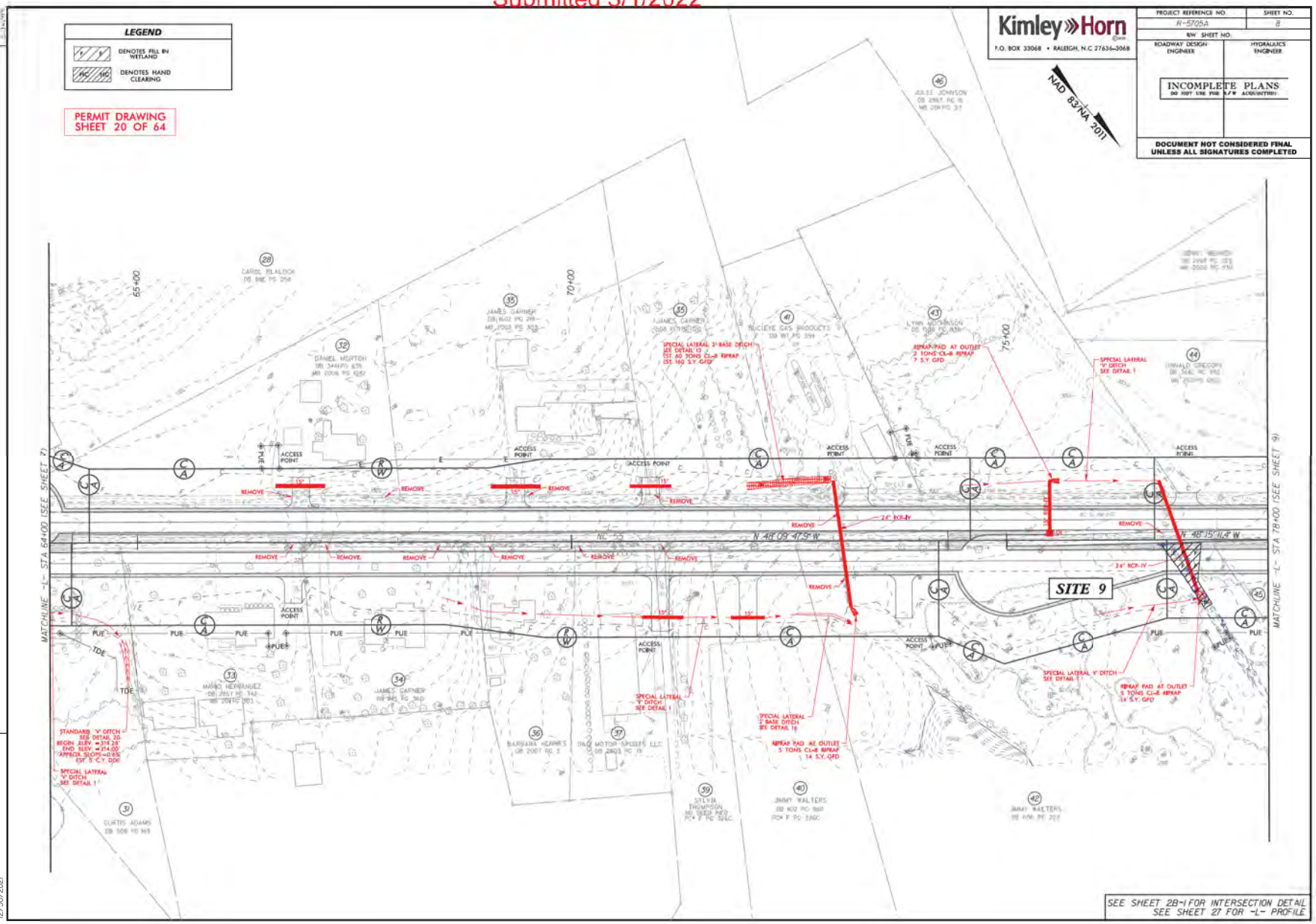
Submitted 3/1/2022



12/30/2021

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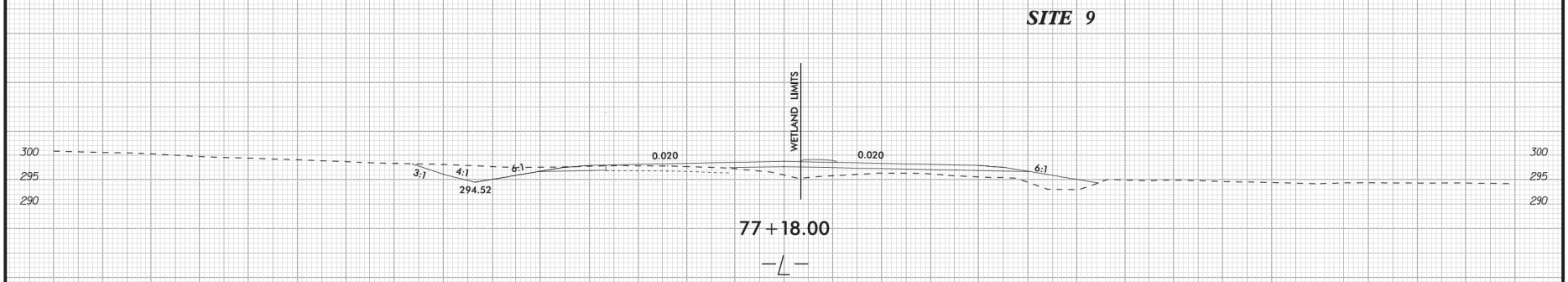
Submitted 3/1/2022

PERMIT DRAWING
SHEET 21 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



12/30/2021

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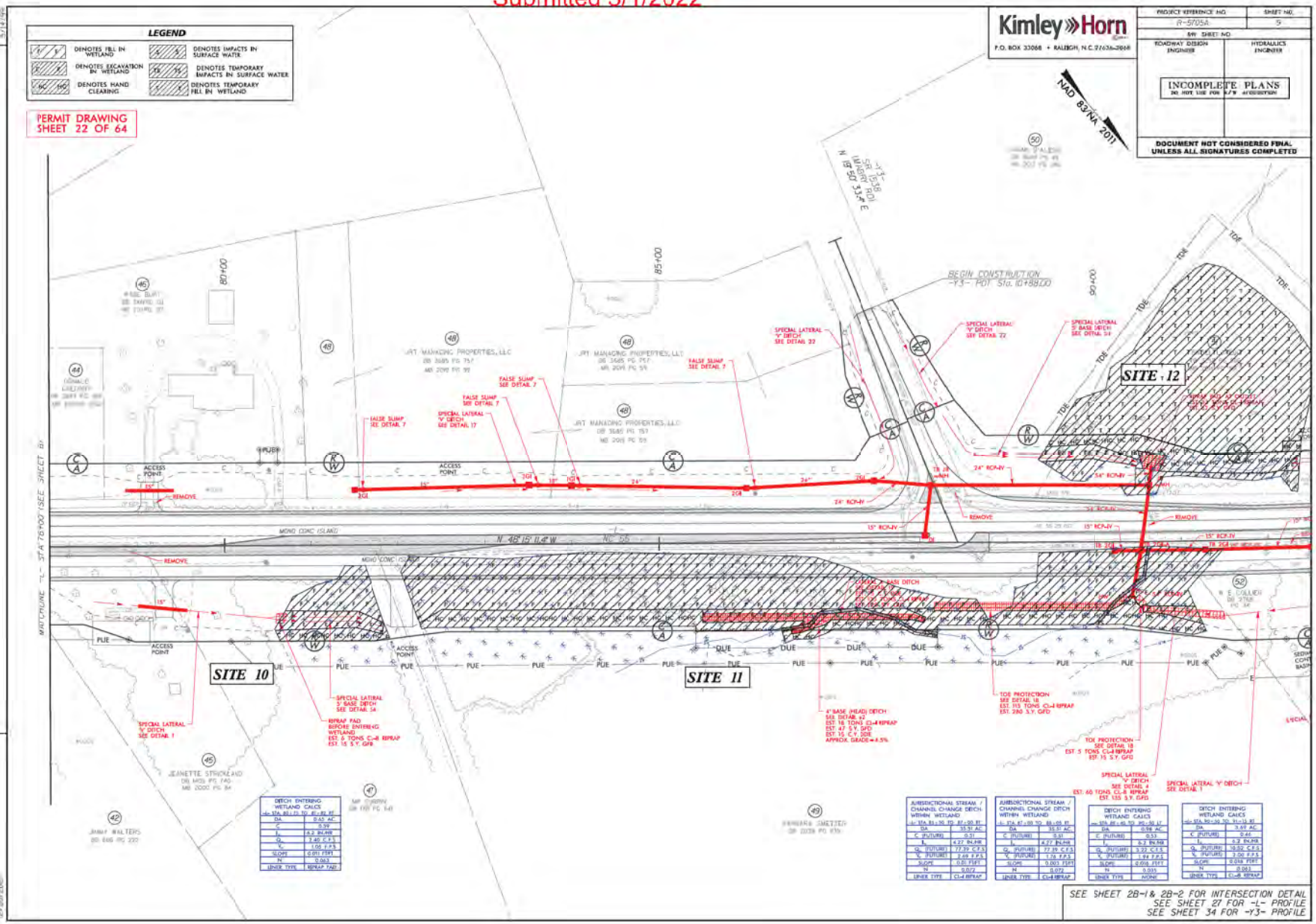
Submitted 3/1/2022



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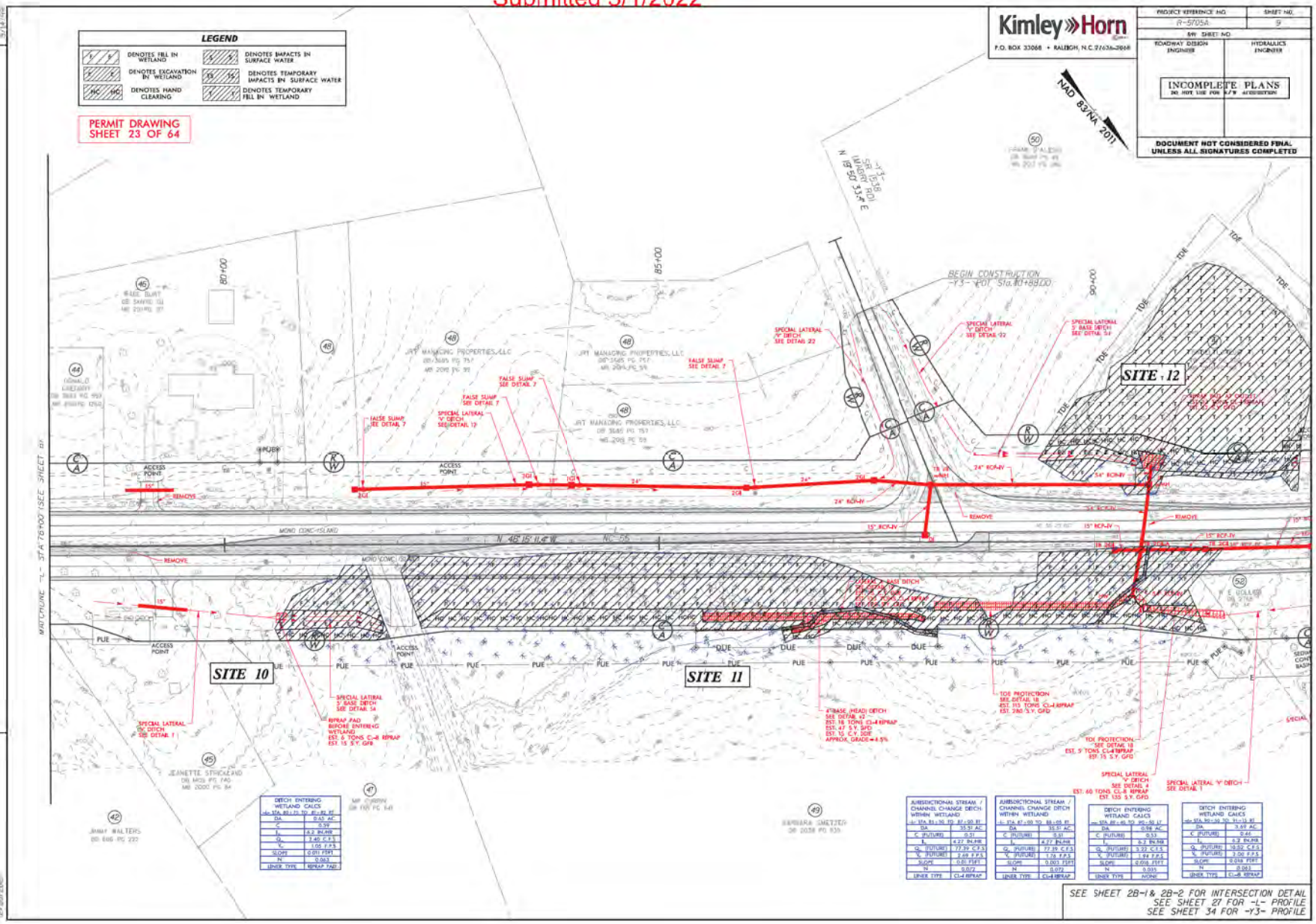
Submitted 3/1/2022



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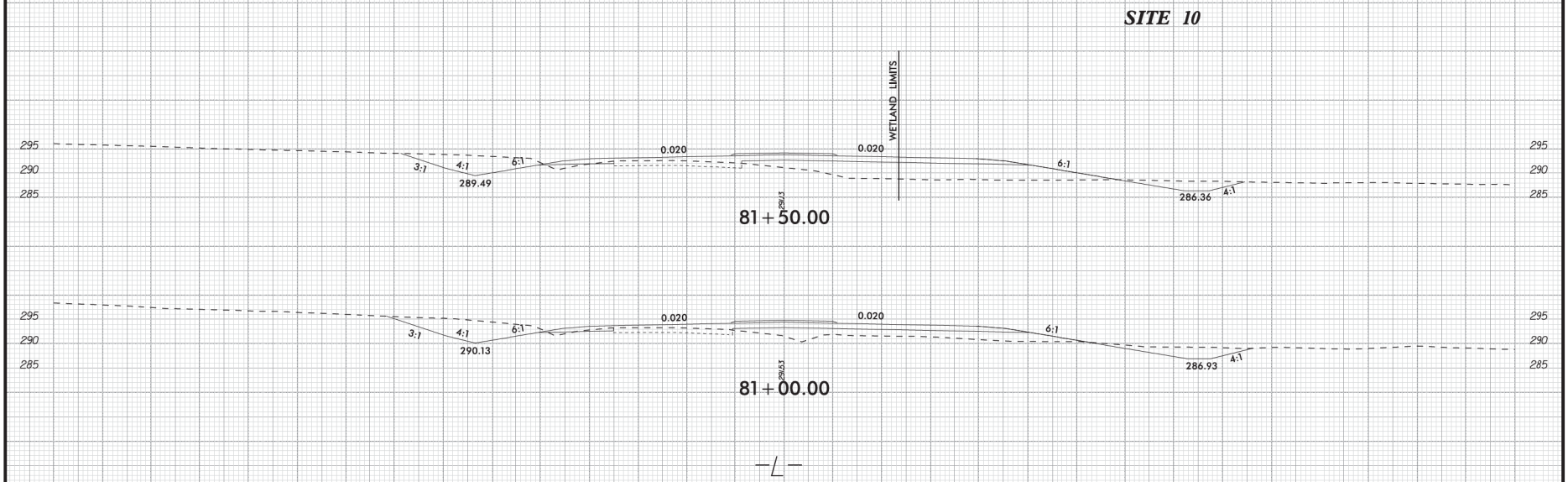
Submitted 3/1/2022

PERMIT DRAWING
SHEET 24 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



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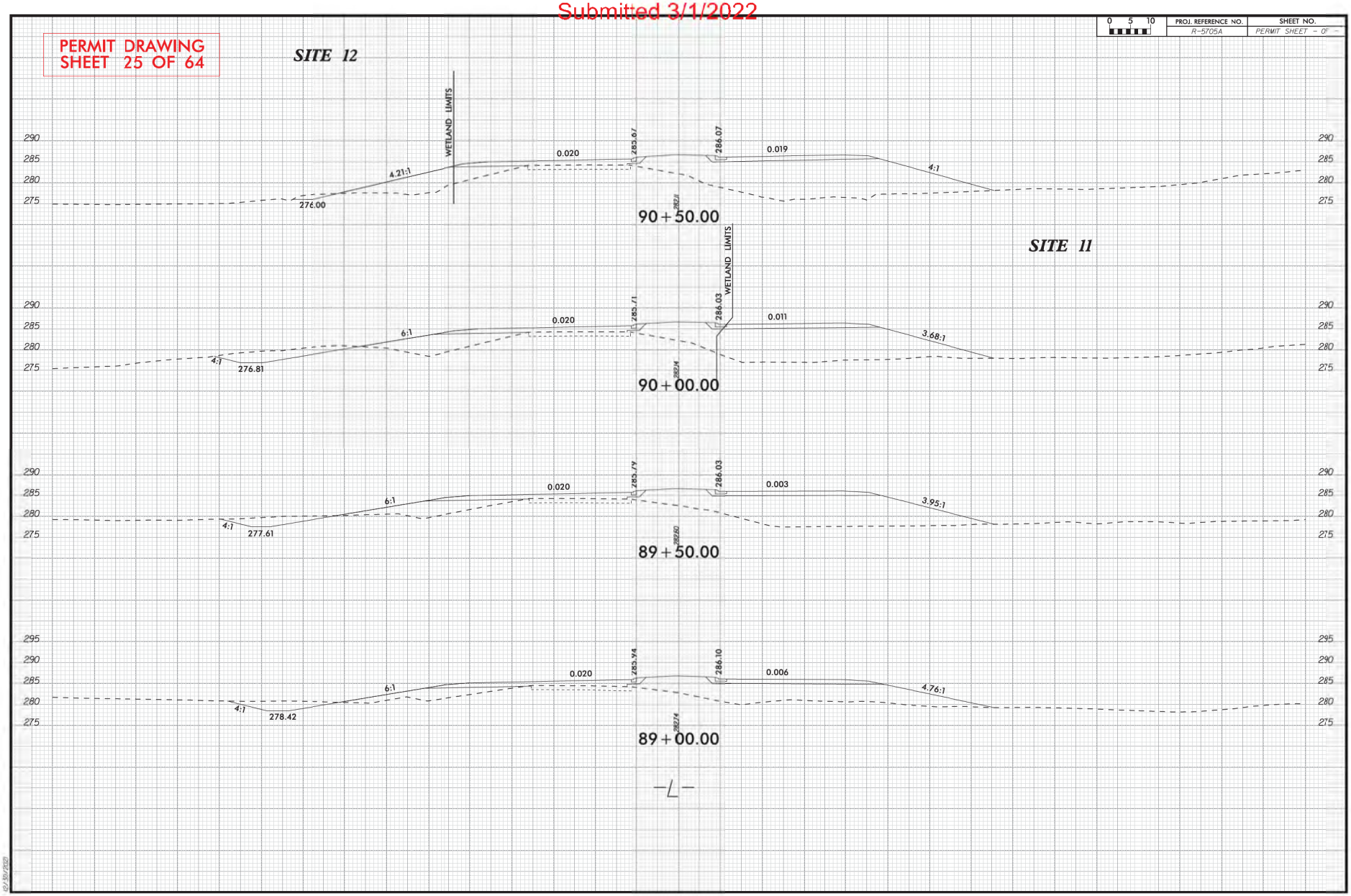
PERMIT DRAWING
SHEET 25 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



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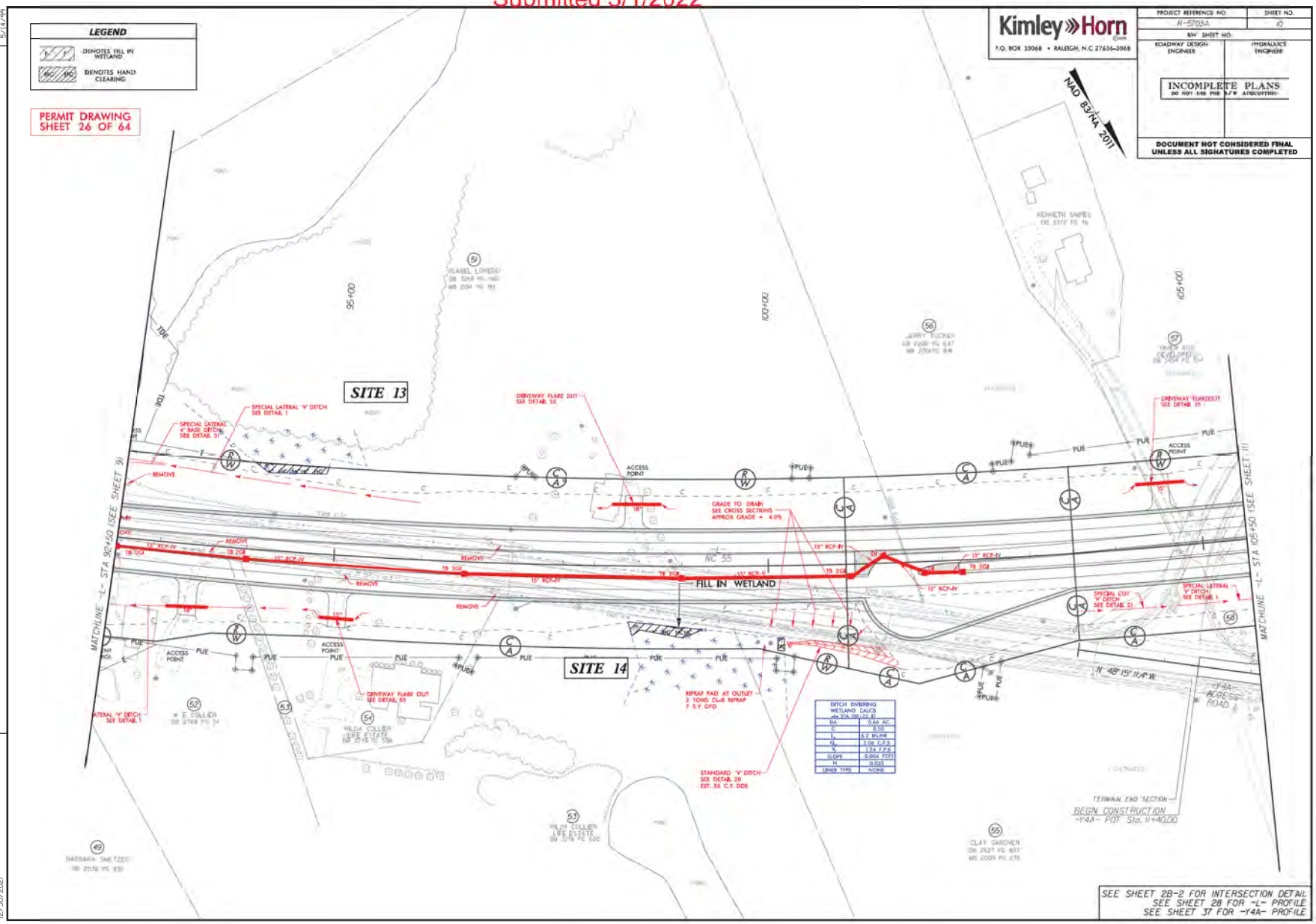
Submitted 3/1/2022



REVISIONS

5/14/99

12/30/2021

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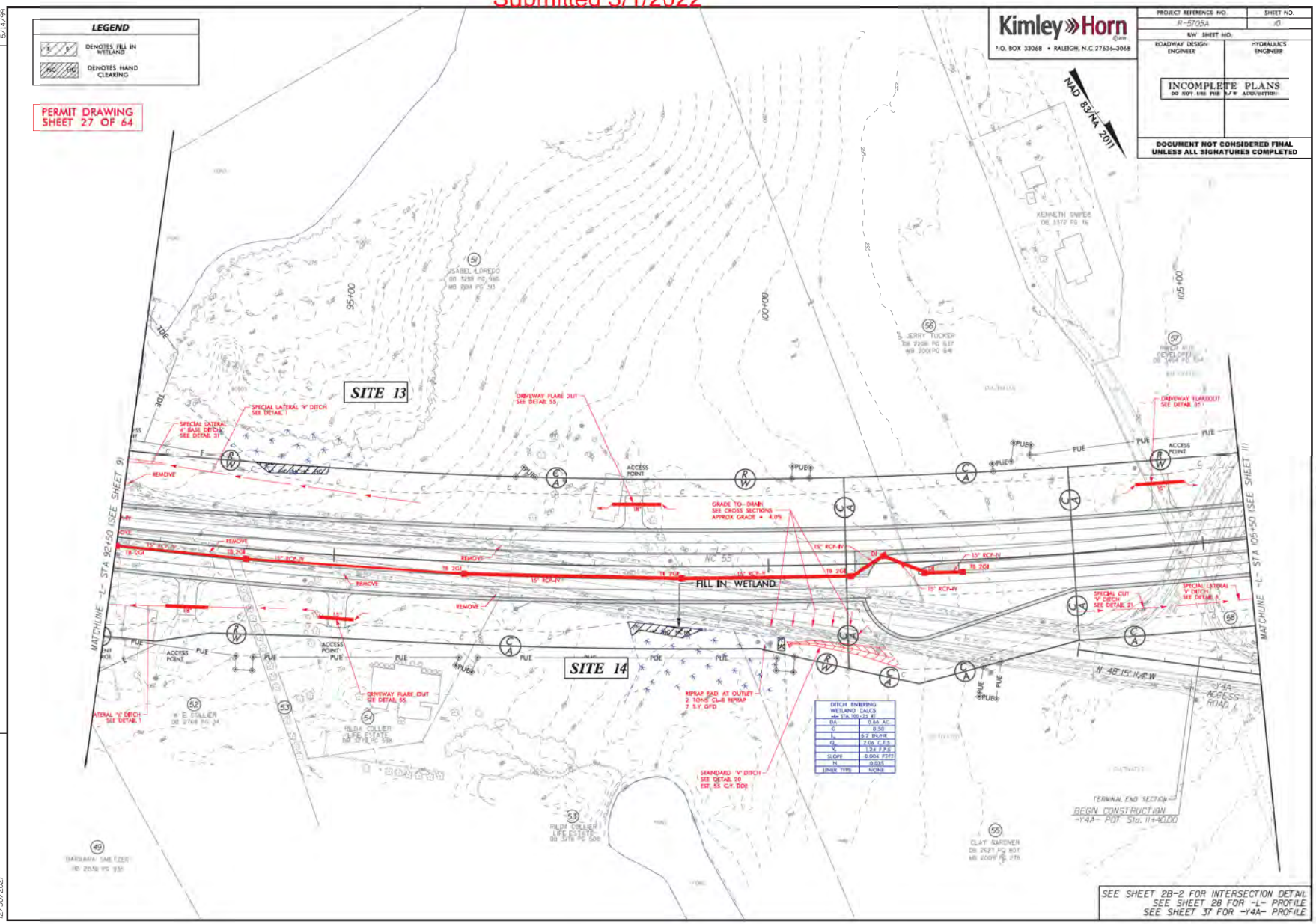
Submitted 3/1/2022



REVISIONS

5/14/99

12/30/2021

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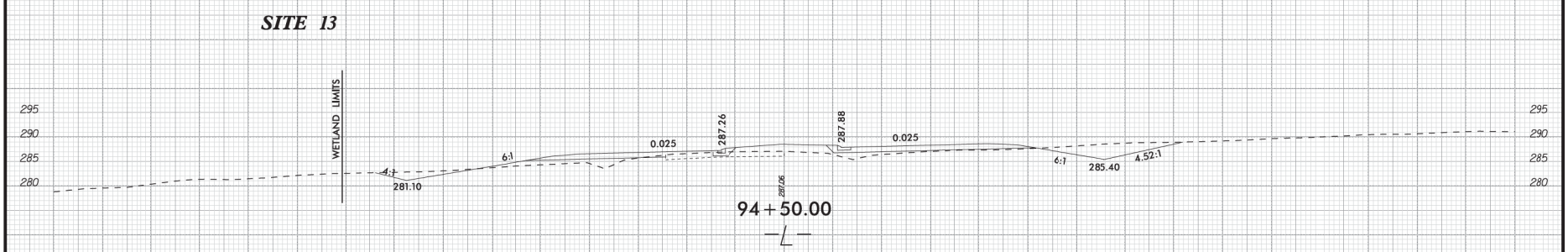
Submitted 3/1/2022

PERMIT DRAWING
SHEET 28 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



12/30/2021

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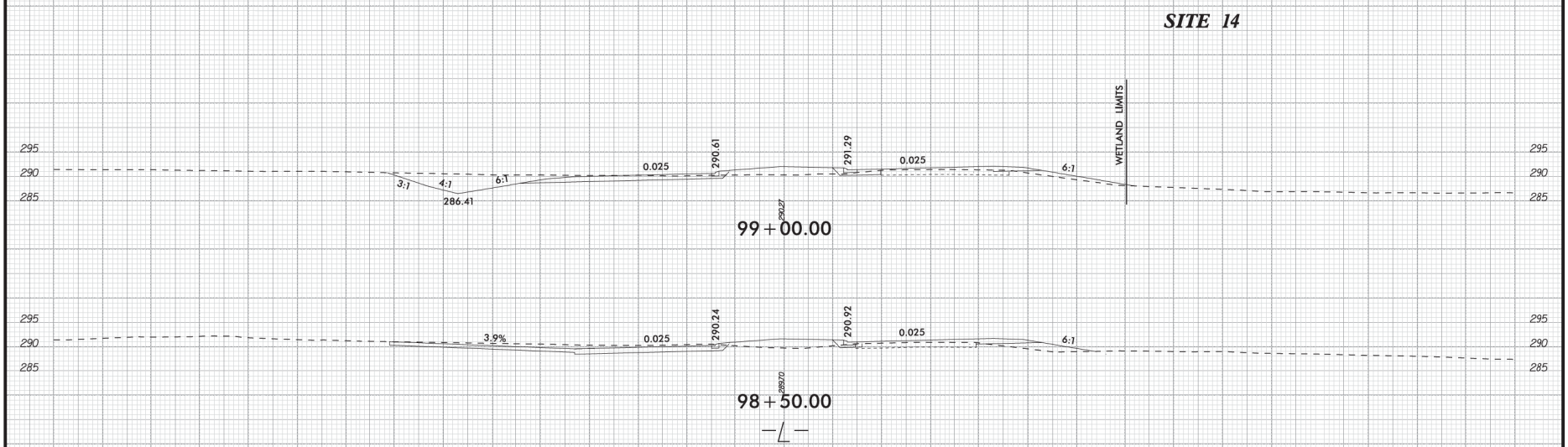
Submitted 3/1/2022

PERMIT DRAWING
SHEET 29 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



12/30/2021

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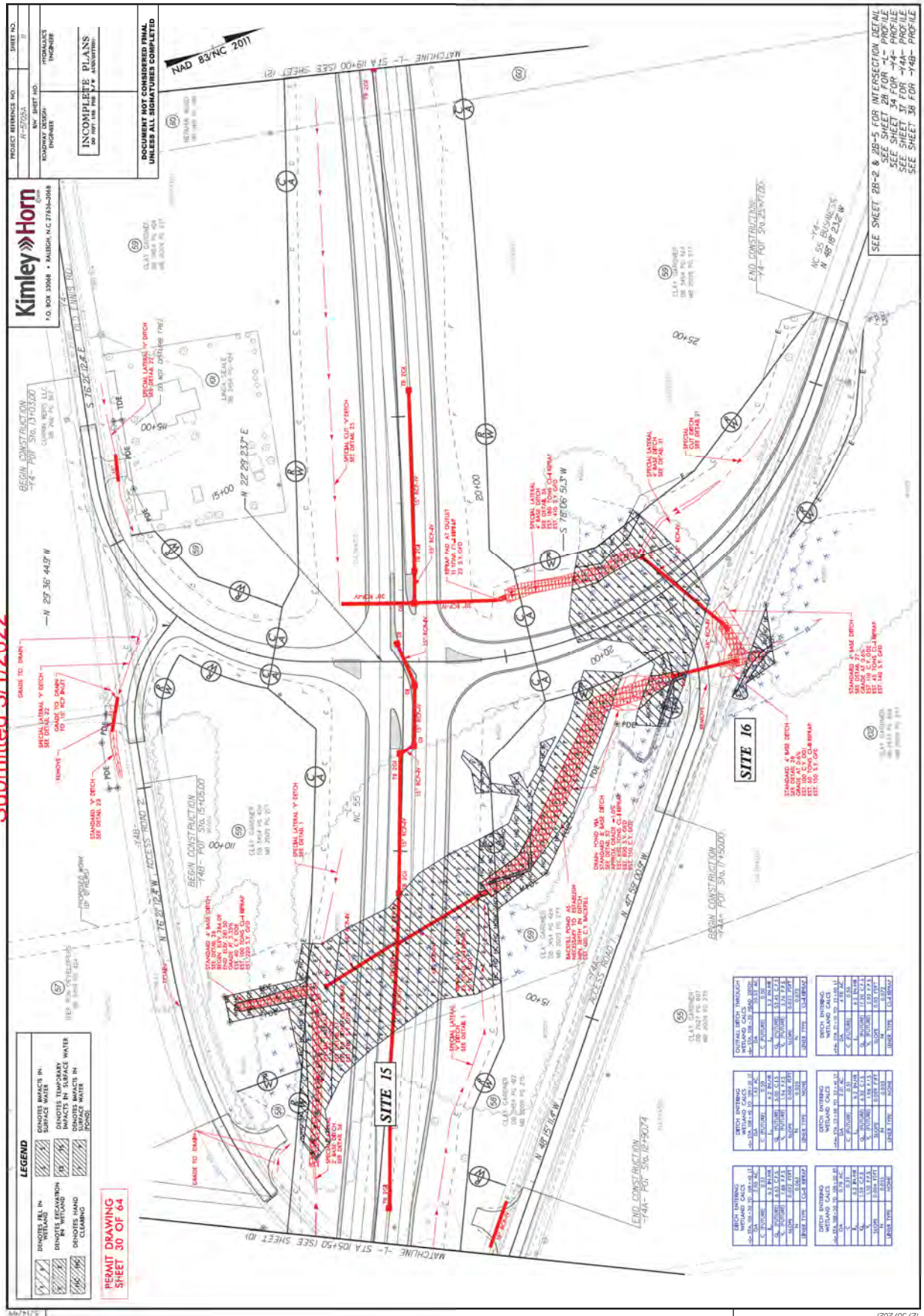
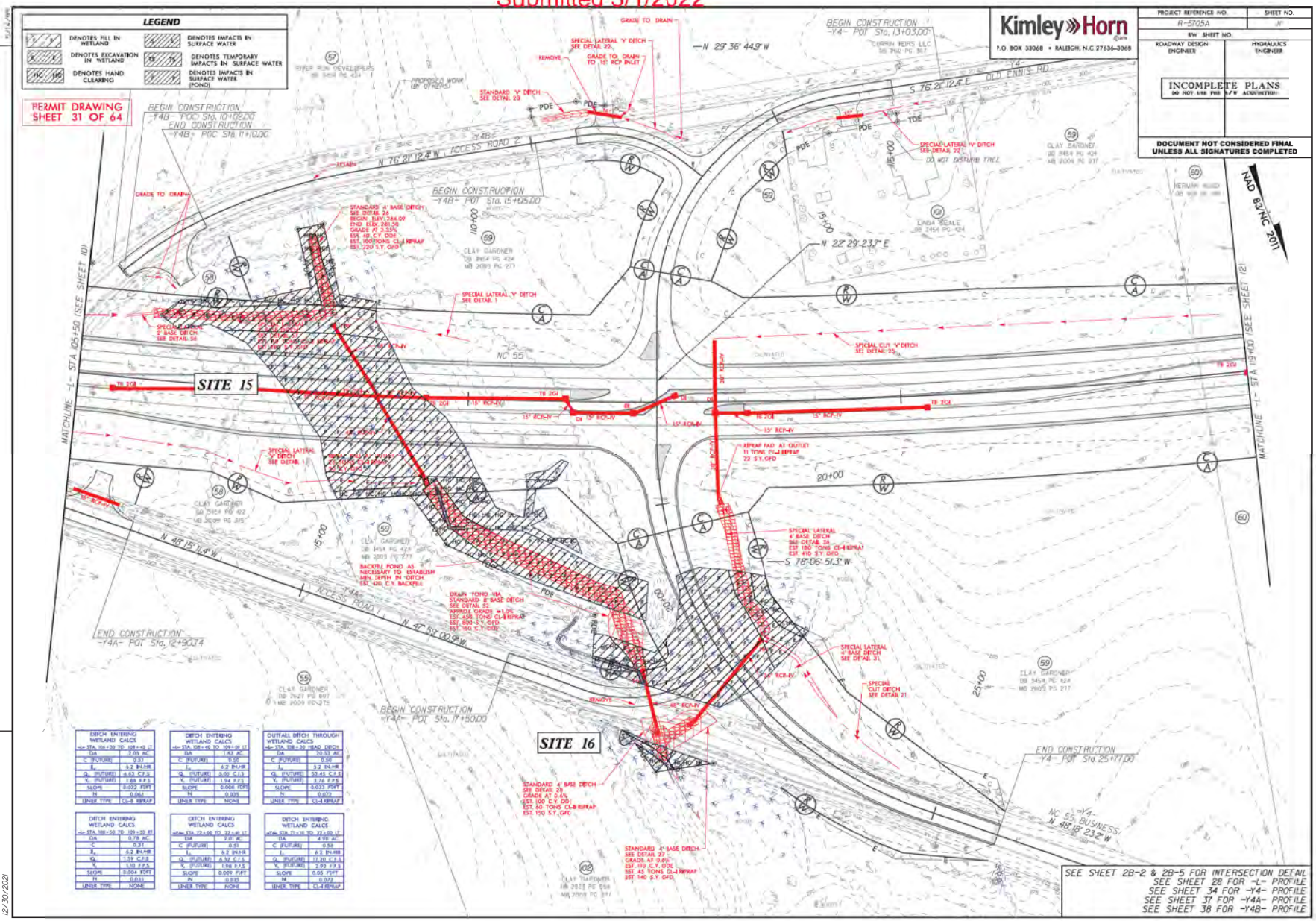

Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
PROJECT REFERENCE NO. A-5705A
SHEET NO. 17
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NC 2011
LEGEND
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES EXCAVATION IN WETLAND
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES HAND CLEARING
DENOTES IMPACTS IN SURFACE WATER (POND)
PERMIT DRAWING SHEET 30 OF 64
SITE 15
SITE 16
BEGIN CONSTRUCTION -L- POT Sta. 13+03.00
BEGIN CONSTRUCTION -Y4- POT Sta. 1+46.00
BEGIN CONSTRUCTION -Y4A- POT Sta. 17+50.00
END CONSTRUCTION -L- POT Sta. 12+90.74
END CONSTRUCTION -Y4- POT Sta. 3+25.47
MATCHLINE -L- STA 105+50 (SEE SHEET 18)
MATCHLINE -L- STA 119+00 (SEE SHEET 18)
SEE SHEET 28-2 & 28-5 FOR INTERSECTION DETAIL
SEE SHEET 28 FOR -L- PROFILE
SEE SHEET 34 FOR -Y4- PROFILE
SEE SHEET 37 FOR -Y4A- PROFILE
SEE SHEET 36 FOR -Y4B- PROFILE
NC 55
NC 55 BUSINESS
ACCESS ROAD 2
ACCESS ROAD 1
N 25° 36' 44.9" W
N 22° 29' 23.7" E
S 78° 06' 51.3" W
N 47° 55' 00.0" W
N 48° 18' 23.2" W
N 76° 09' 12.8" W
N 48° 15' 15.4" W
CLAY GARNER
DB 3454 PG 424
MB 2009 PG 211
LINDA SCALF
DB 1954 PG 424
MB 2004 PG 211
CARON REPS LLC
DB 2412 PG 347
DB 3621 PG 687
MB 2004 PG 275
DB 3454 PG 424
MB 2009 PG 211
DB 3621 PG 687
MB 2004 PG 275
DB 3621 PG 687
MB 2004 PG 275
DITCH INTENSIVE WETLAND CALCS
DITCH INTENSIVE WETLAND CALCS
OUTFALL DITCH THROUGH WETLAND CALCS
DITCH INTENSIVE WETLAND CALCS
DITCH INTENSIVE WETLAND CALCS
DITCH INTENSIVE WETLAND CALCS
Submitted 3/1/2022
REVISIONS
12/20/2021

Submitted 3/1/2022



DITCH ENTERING WETLAND CALCS -L- STA. 106+30 TO 108+40 LT	
DA	2.05 AC
C (FUTURE)	0.51
I_a	6.2 IN/HR
Q_a (FUTURE)	6.53 C.F.S.
V_a (FUTURE)	1.88 F.P.S.
SLOPE	0.032 FEET
N	0.063
LINER TYPE	CL-8 RIPRAP

DITCH ENTERING WETLAND CALCS -L- STA. 108+40 TO 109+20 LT	
DA	1.63 AC
C (FUTURE)	0.50
I_a	6.2 IN/HR
Q_a (FUTURE)	5.00 C.F.S.
V_a (FUTURE)	1.94 F.P.S.
SLOPE	0.008 FEET
N	0.035
LINER TYPE	NONE

OUTFALL DITCH THROUGH WETLAND CALCS -L- STA. 108+30 HEAD DITCH	
DA	20.53 AC
C (FUTURE)	0.50
I_a	5.2 IN/HR
Q_a (FUTURE)	53.45 C.F.S.
V_a (FUTURE)	3.76 F.P.S.
SLOPE	0.033 FEET
N	0.072
LINER TYPE	CL-8 RIPRAP

DITCH ENTERING WETLAND CALCS -L- STA. 108+50 TO 109+20 RT	
DA	0.78 AC
C	0.31
I_a	6.2 IN/HR
Q_a	1.59 C.F.S.
V_a	1.10 F.P.S.
SLOPE	0.004 FEET
N	0.035
LINER TYPE	NONE

DITCH ENTERING WETLAND CALCS -Y4- STA. 22+00 TO 22+40 LT	
DA	2.01 AC
C (FUTURE)	0.51
I_a	6.2 IN/HR
Q_a (FUTURE)	6.52 C.F.S.
V_a (FUTURE)	1.98 F.P.S.
SLOPE	0.009 FEET
N	0.035
LINER TYPE	NONE

DITCH ENTERING WETLAND CALCS -Y4- STA. 21+10 TO 22+00 LT	
DA	4.98 AC
C (FUTURE)	0.56
I_a	6.2 IN/HR
Q_a (FUTURE)	17.20 C.F.S.
V_a (FUTURE)	2.92 F.P.S.
SLOPE	0.05 FEET
N	0.072
LINER TYPE	CL-8 RIPRAP

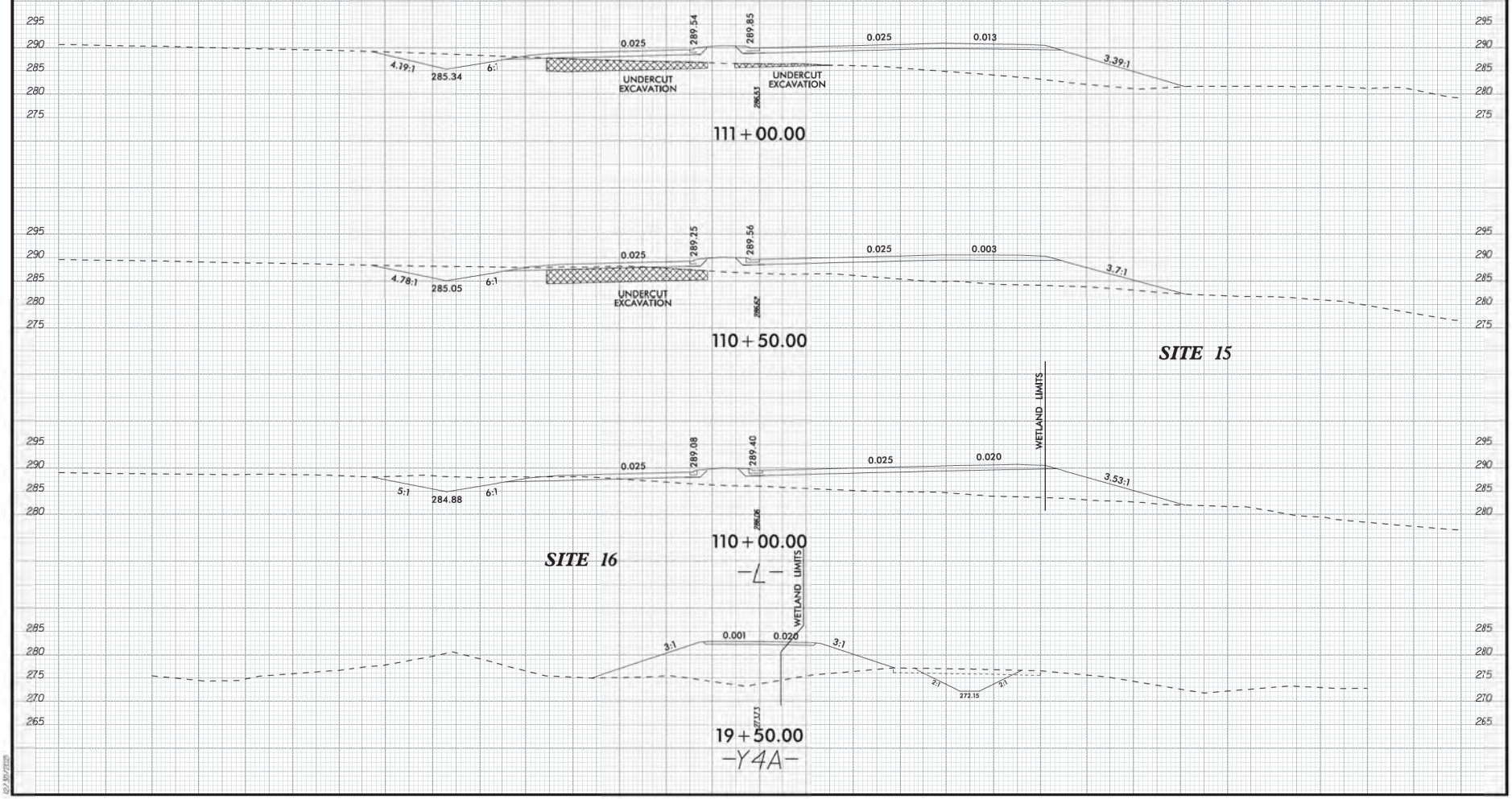
REVISIONS

12/30/2021

Submitted 3/1/2022

PERMIT DRAWING
SHEET 32 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



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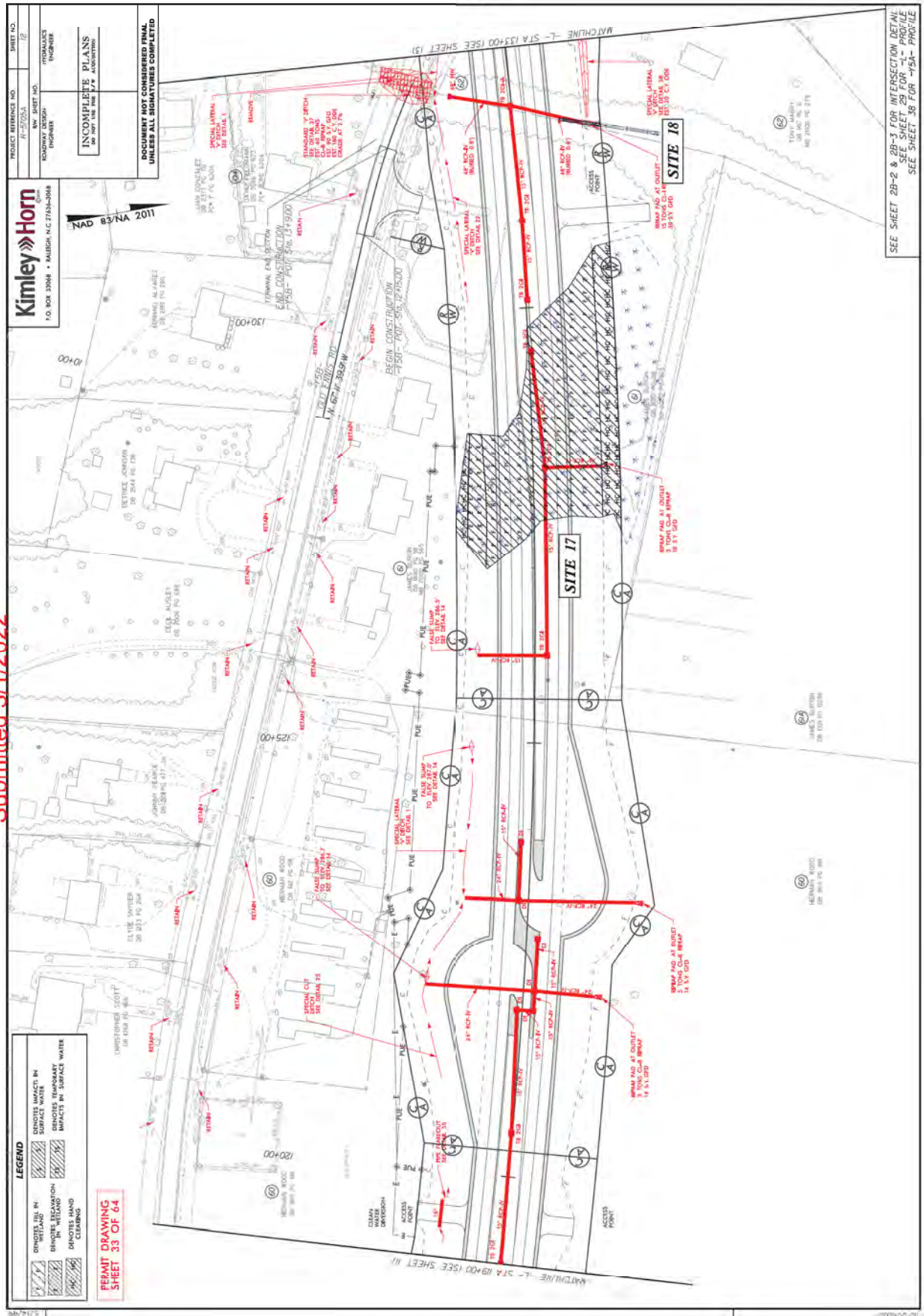
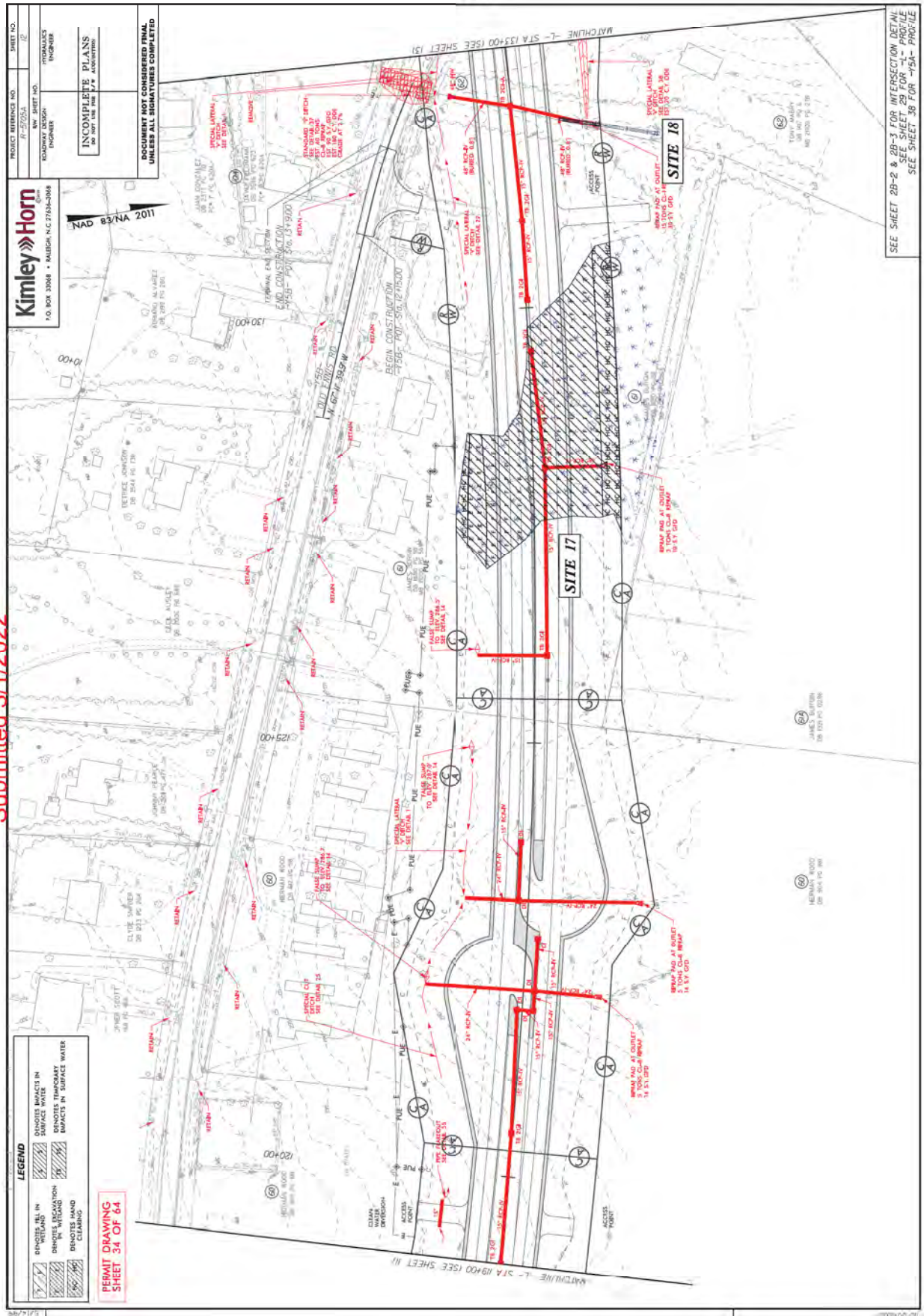


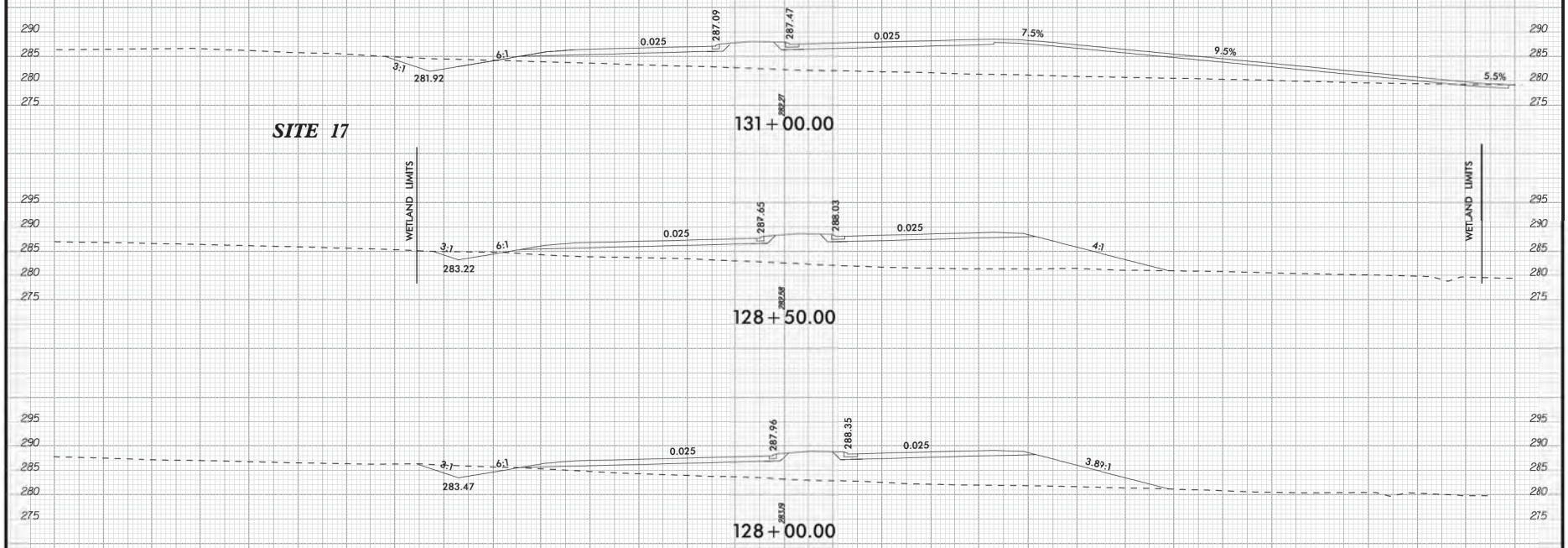
Submitted 3/1/2022


Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
NAD 83/NA 2011
PROJECT REFERENCE NO.
R-5705A
SHEET NO.
12
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
SEE SHEET 2B-2 & 2B-3 FOR INTERSECTION DETAIL
SEE SHEET 3A FOR "Y5A" PROFILE
SEE SHEET 3B FOR "Y5A" PROFILE
SITE 17
SITE 18
LEGEND
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES EXCAVATION IN WETLAND
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES HAND CLEARING
PERMIT DRAWING
SHEET 34 OF 64
Submitted 3/1/2022

Submitted 3/1/2022

PERMIT DRAWING
SHEET 35 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



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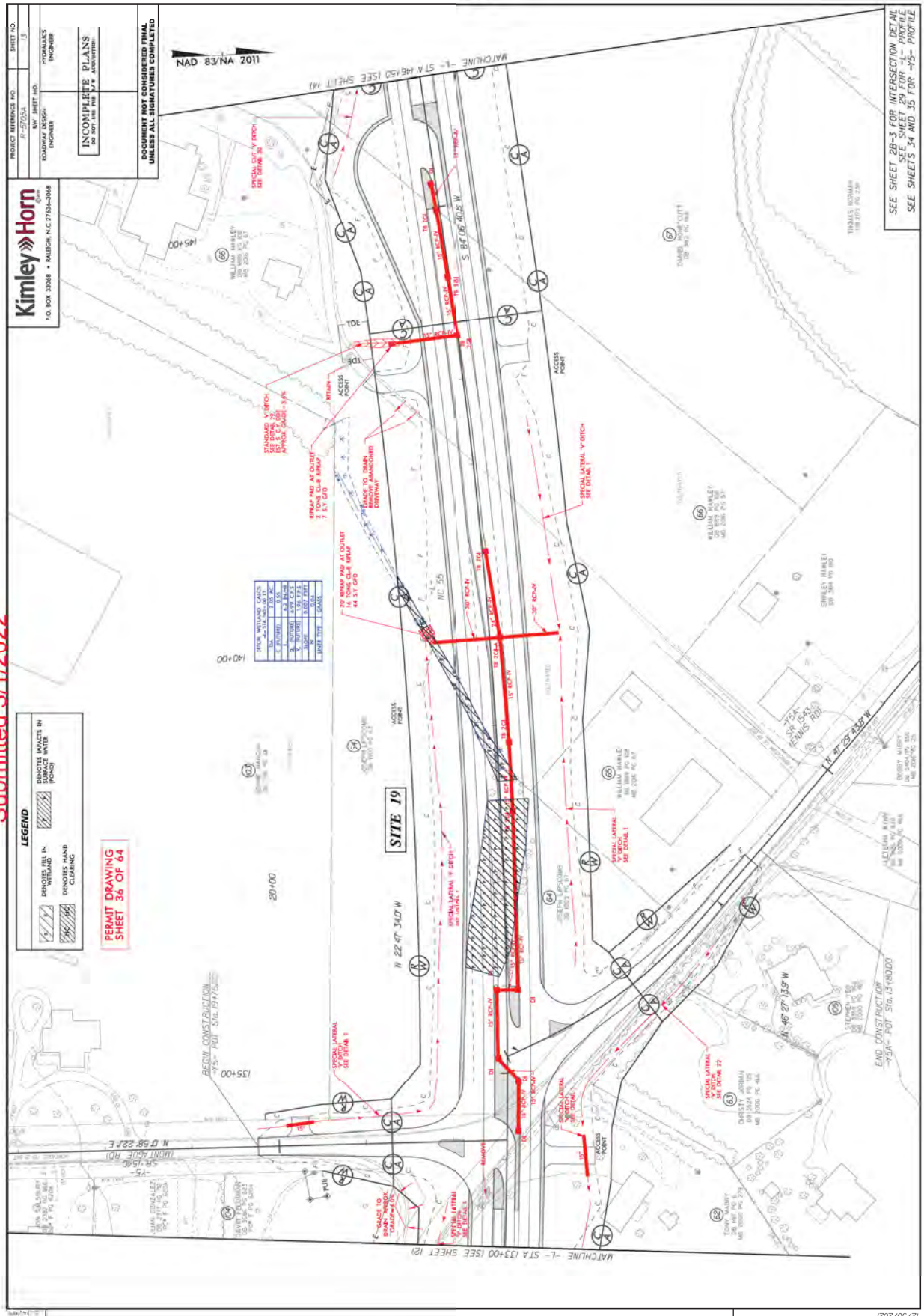
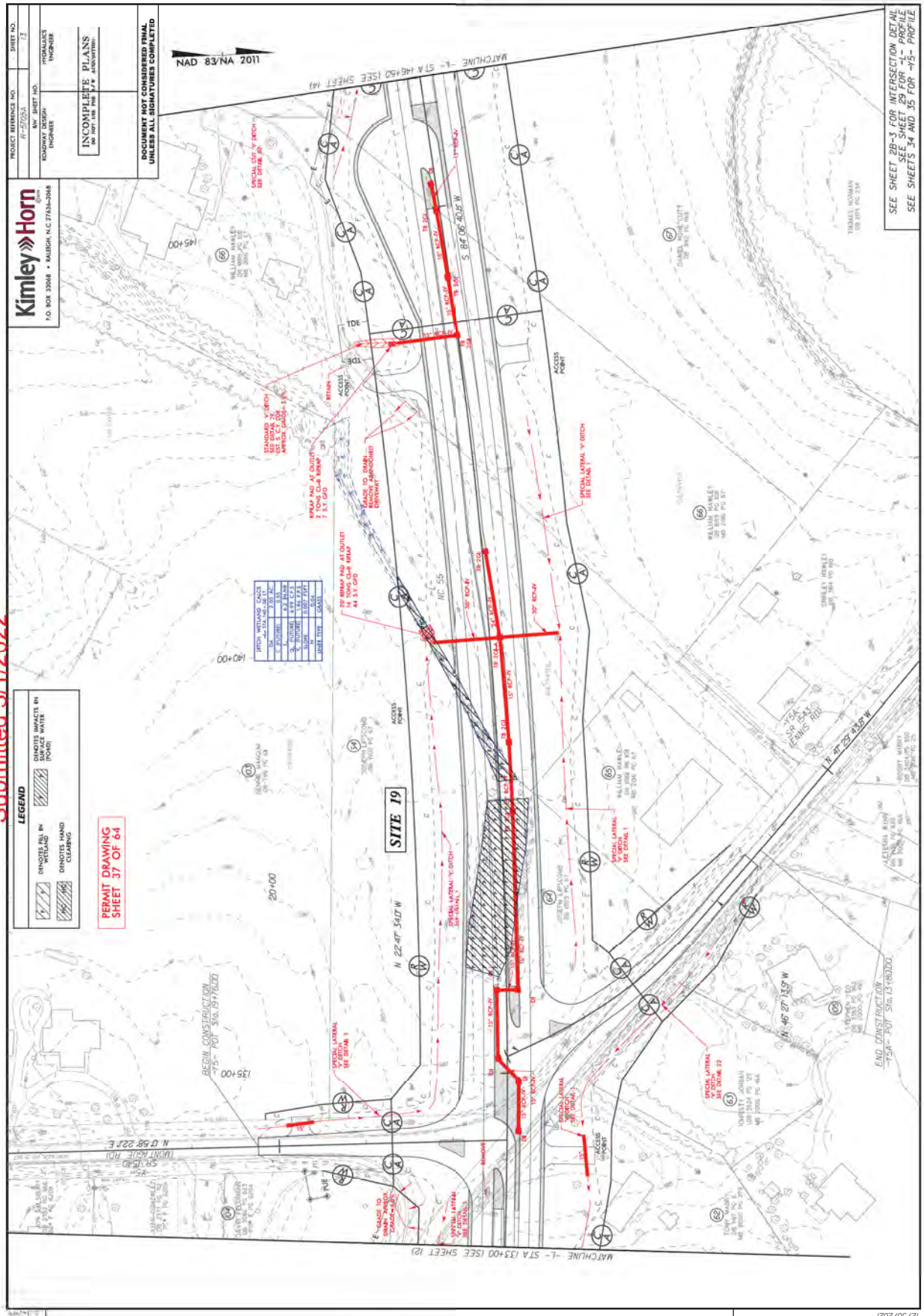

Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
PROJECT REFERENCE NO. R-5704A
SHEET NO. 13
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
SEE SHEET 28-3 FOR INTERSECTION DETAIL
SEE SHEET 29 FOR -L- PROFILE
SEE SHEETS 34 AND 35 FOR -Y5- PROFILE
MATCHLINE -L- STA 146+50 (SEE SHEET 14)
MATCHLINE -L- STA 133+00 (SEE SHEET 12)
SITE 19
NC 55
SR 1540 (LIGHT FACTORY RD)
SR 1543 (LEWIS RD)
BEGIN CONSTRUCTION -Y5- POT Sta. 19+75
END CONSTRUCTION -Y5A- POT Sta. 13+00.00
LEGEND
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER (POND)
DENOTES HAND CLEARING
PERMIT DRAWING SHEET 36 OF 64
Submitted 3/1/2022
12/30/2021



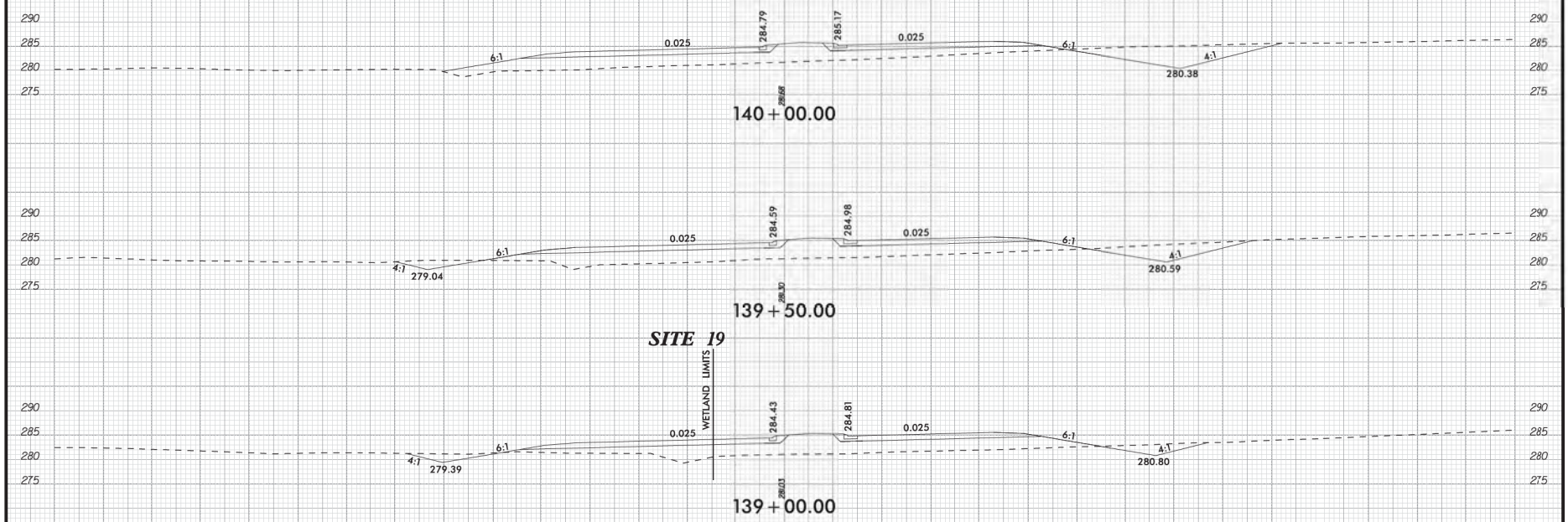
Submitted 3/1/2022

12/30/2021

Submitted 3/1/2022

PERMIT DRAWING
SHEET 38 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



12/30/2021

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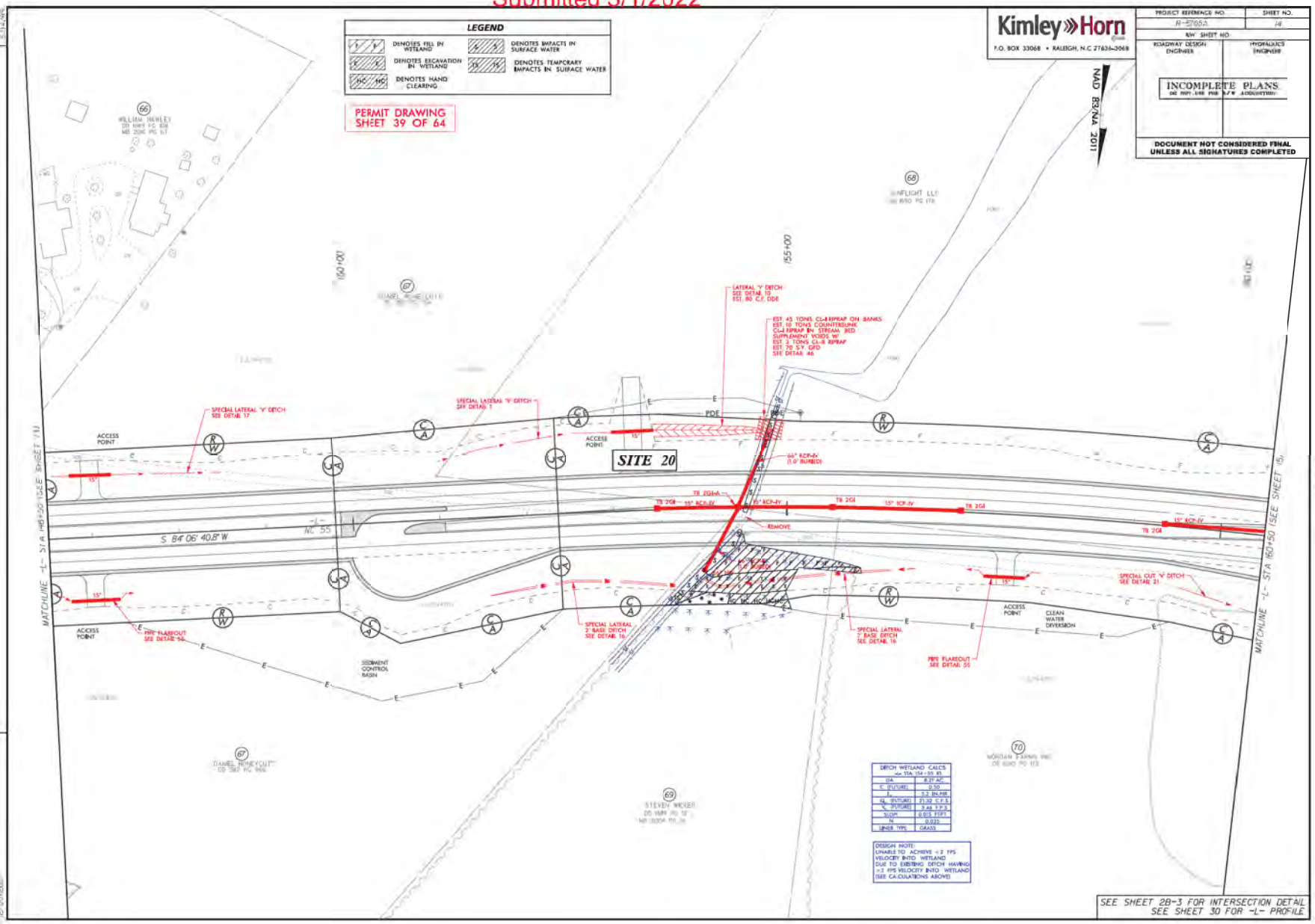
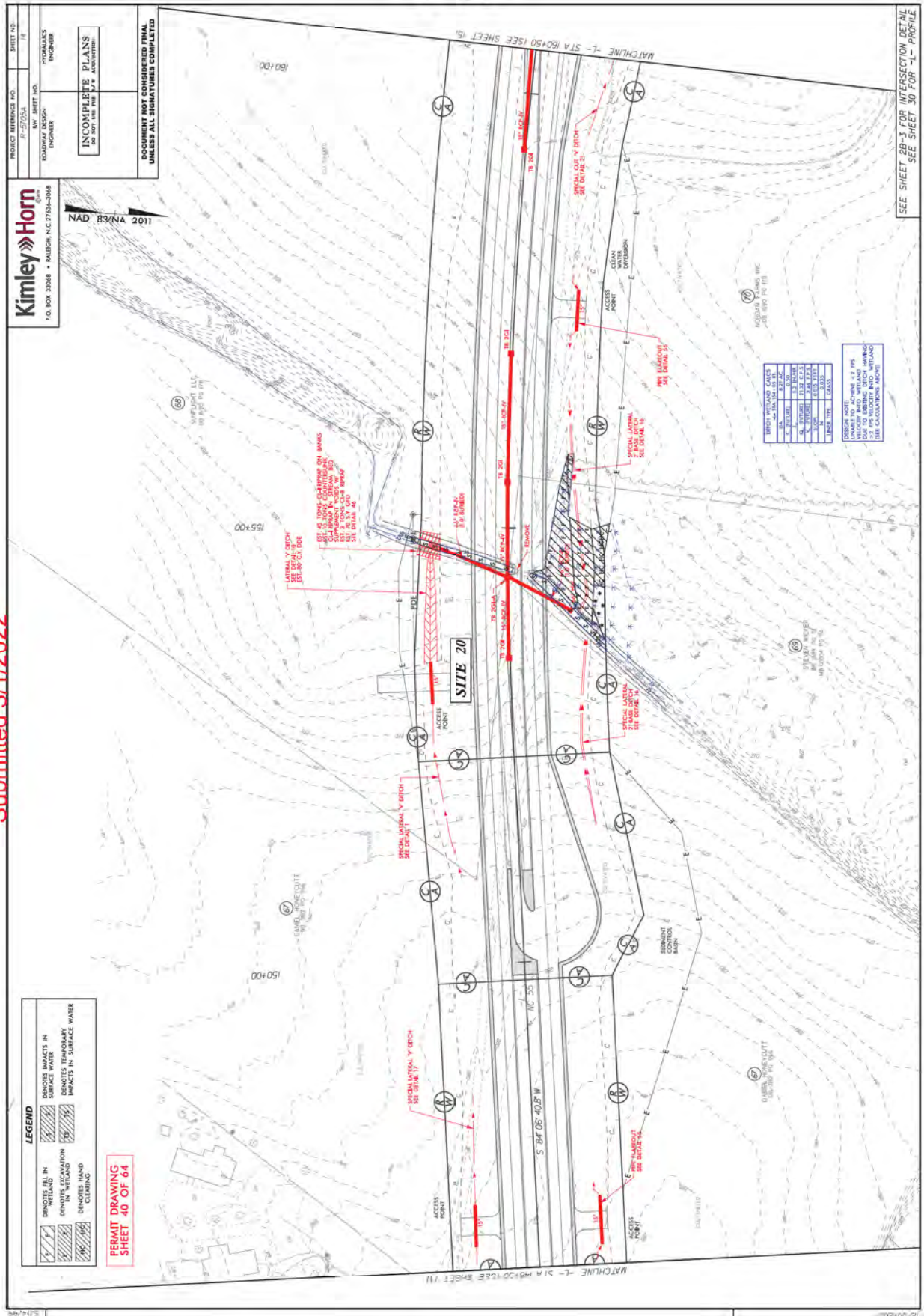
Submitted 3/1/2022



P-65



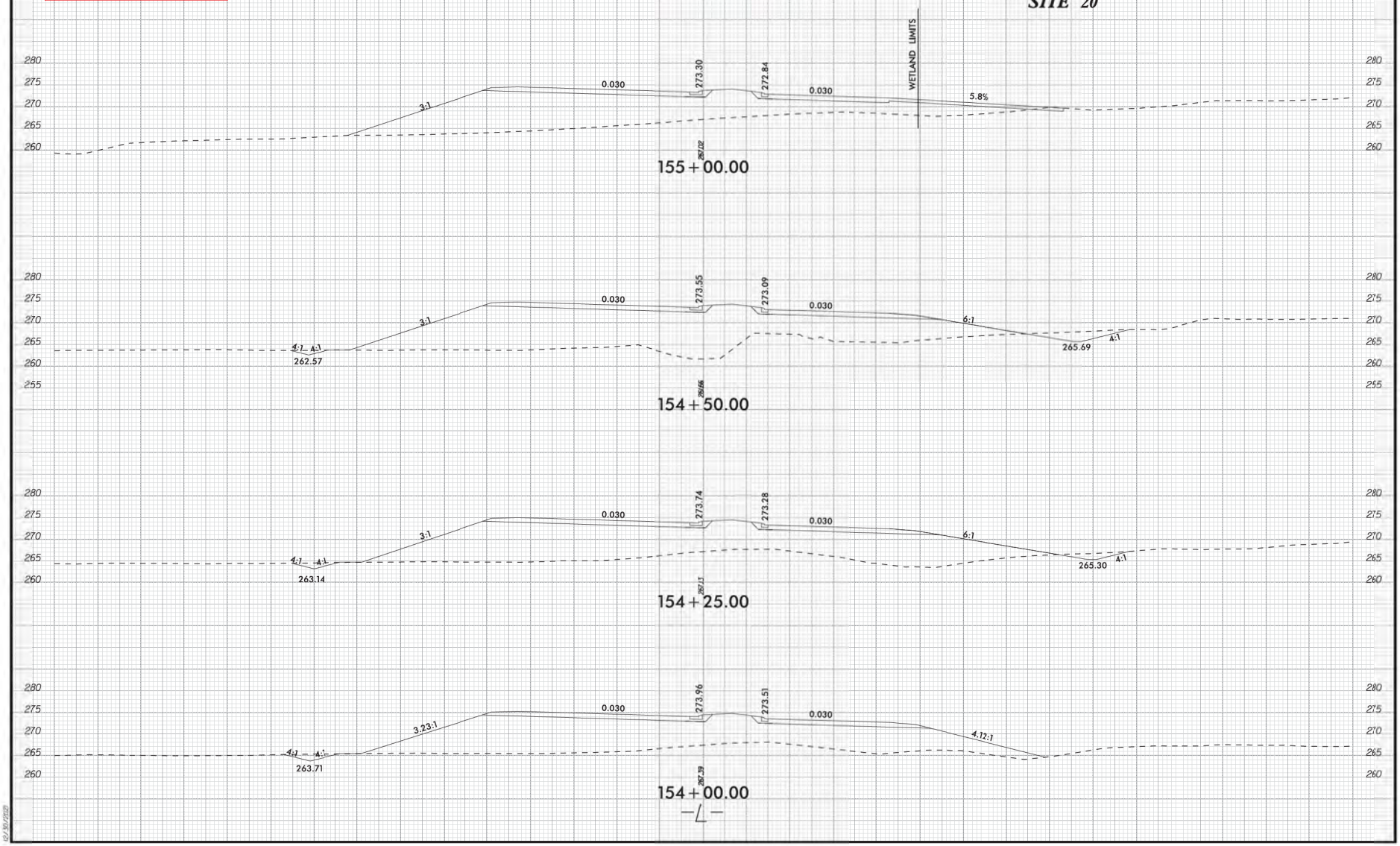
Submitted 3/1/2022

Submitted 3/1/2022

PERMIT DRAWING
SHEET 41 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -

SITE 20



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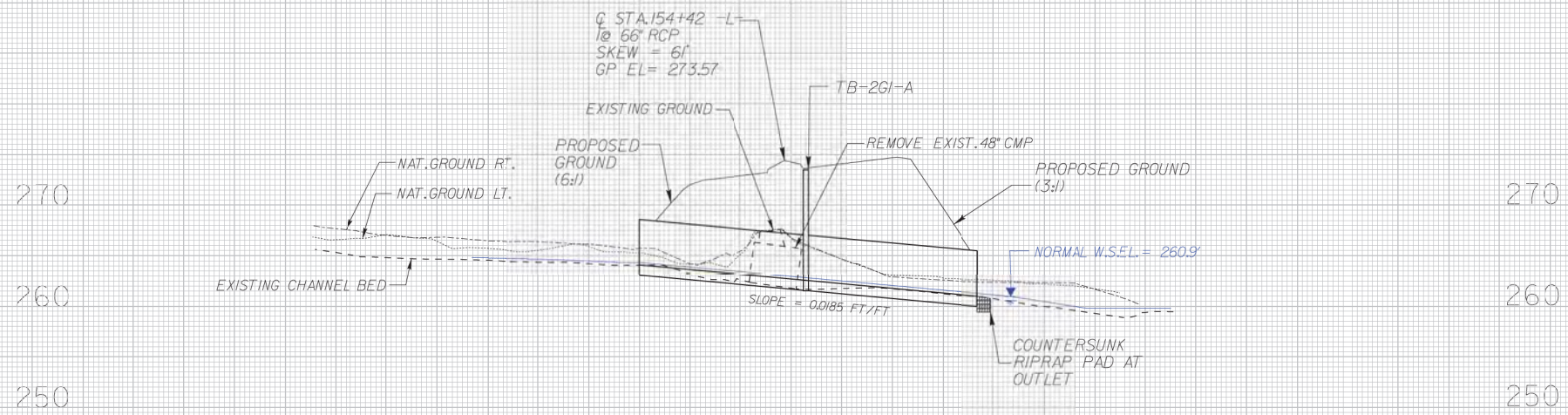
Submitted 3/1/2022

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -

PERMIT DRAWING
SHEET 42 OF 64

SITE 20



12/30/2021

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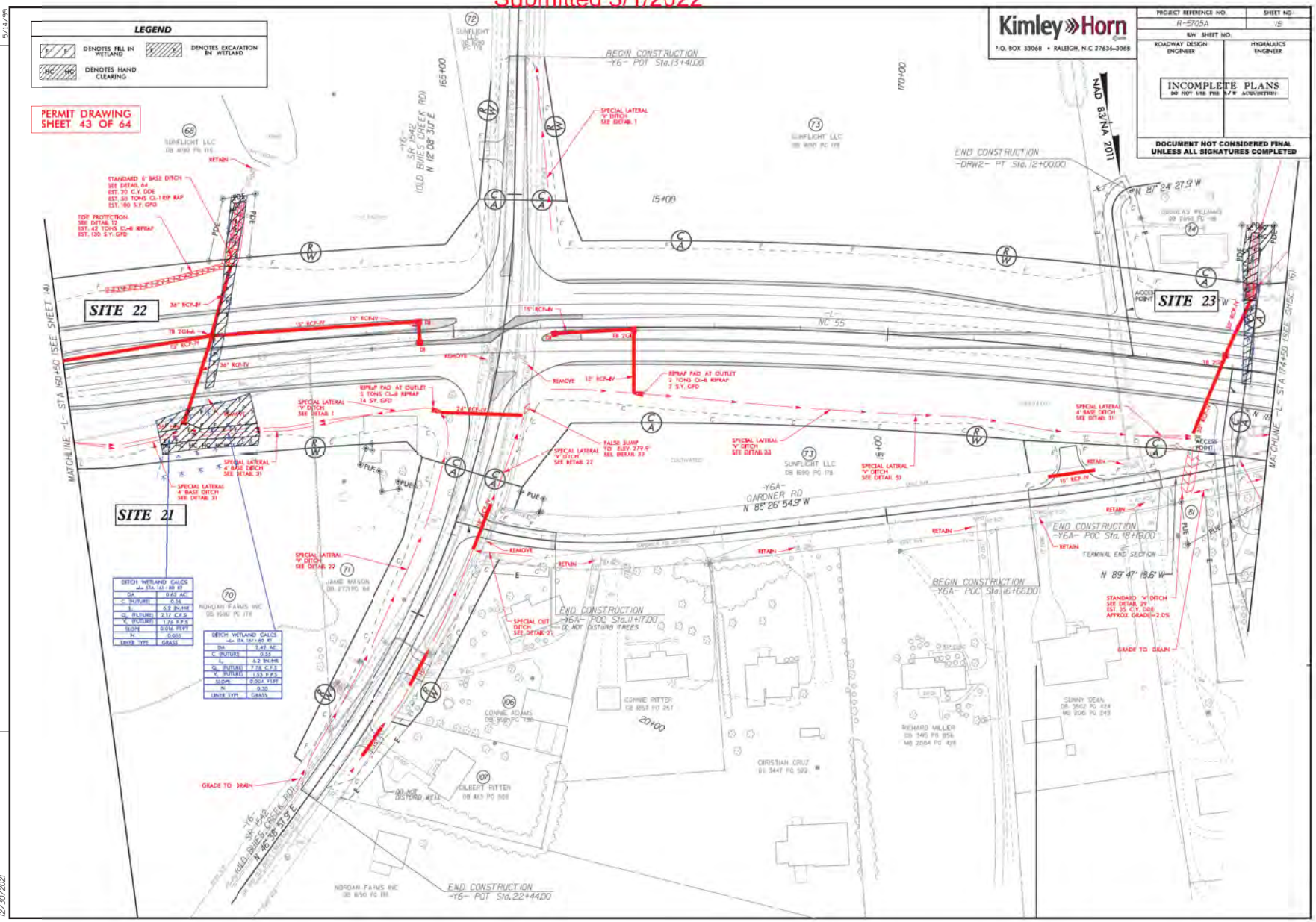
Submitted 3/1/2022



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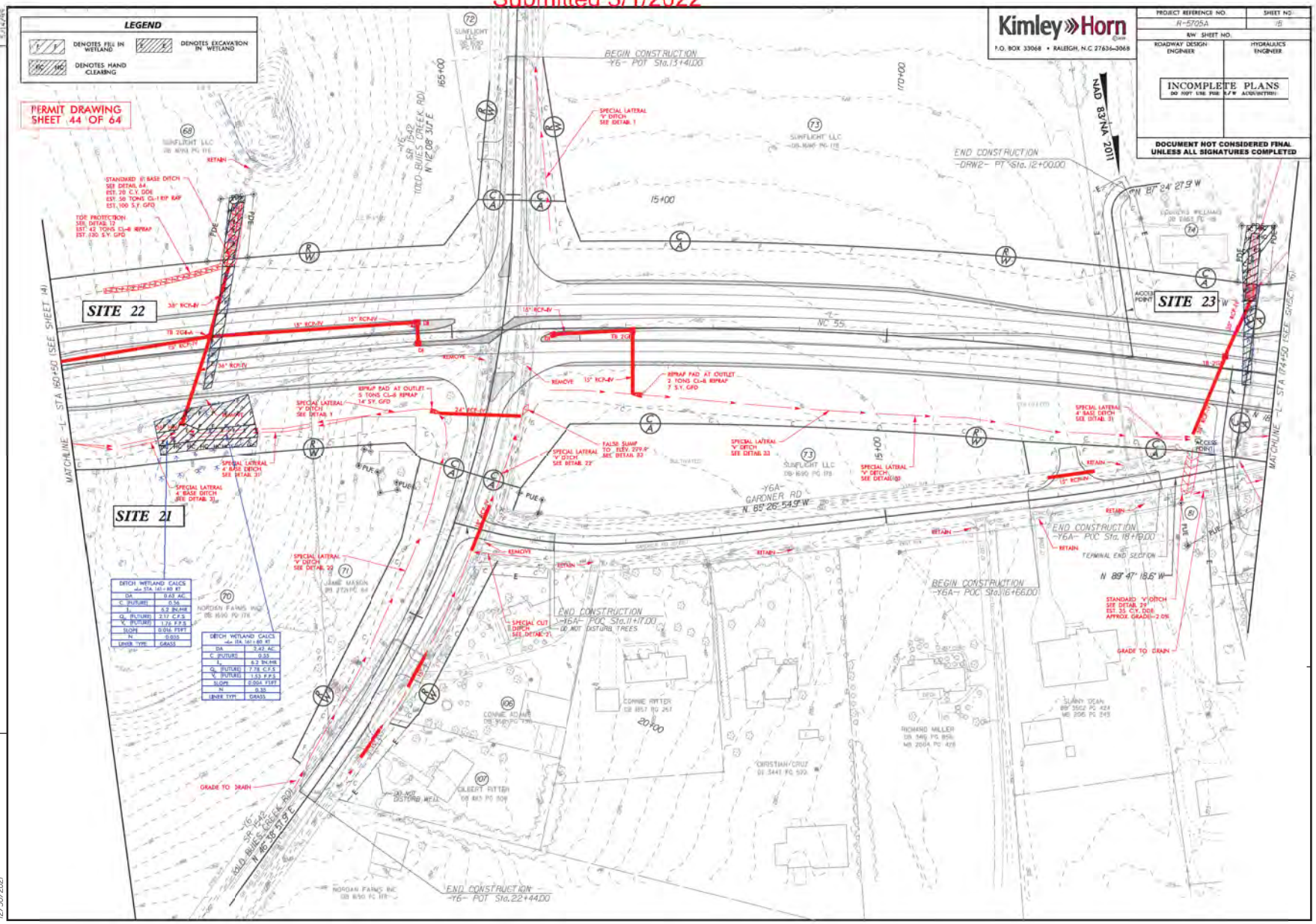
Submitted 3/1/2022



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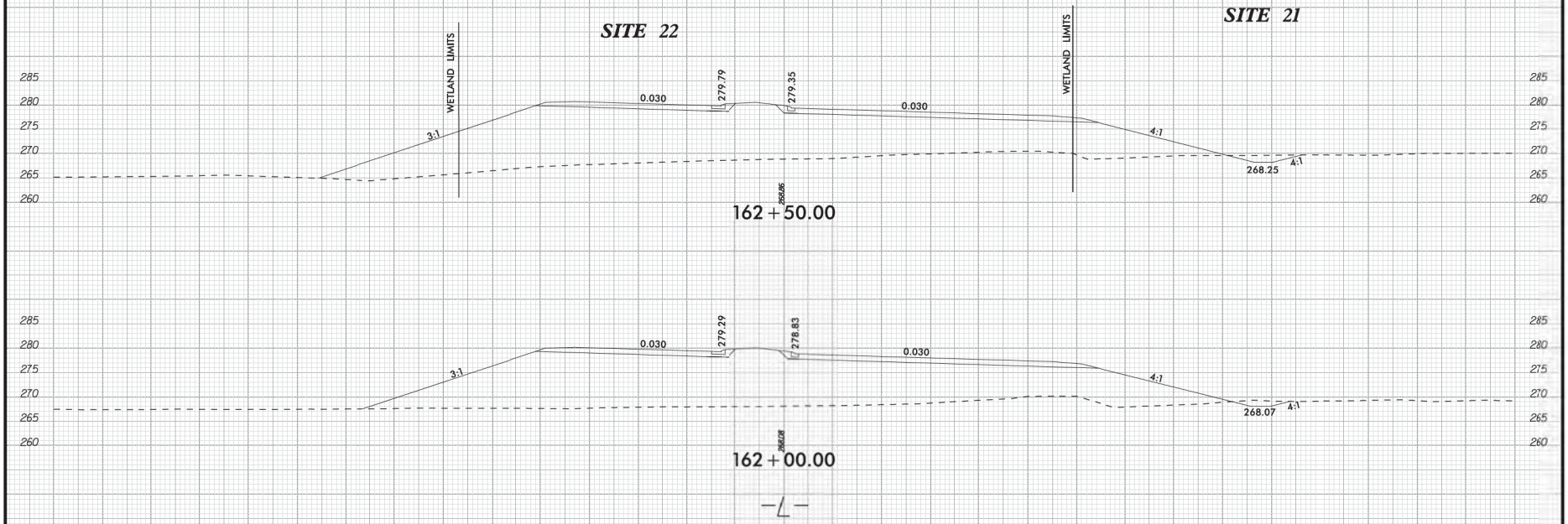
Submitted 3/1/2022

PERMIT DRAWING
SHEET 45 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



12/30/2021

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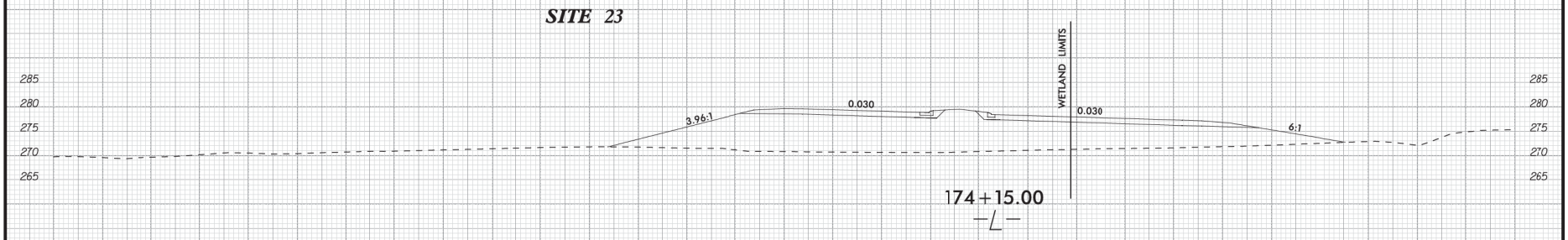
Submitted 3/1/2022

PERMIT DRAWING
SHEET 46 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



12/30/2021

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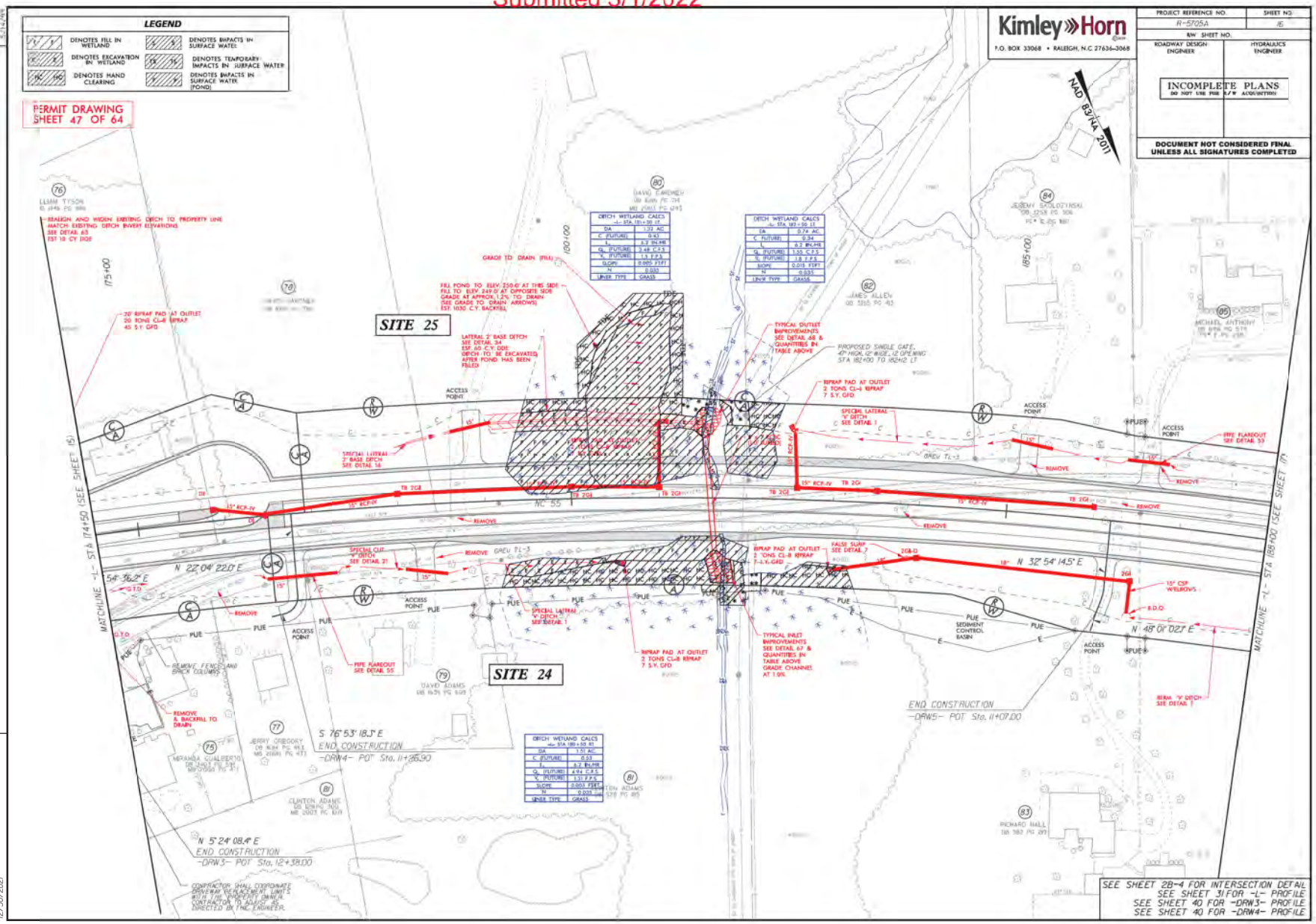
Submitted 3/1/2022



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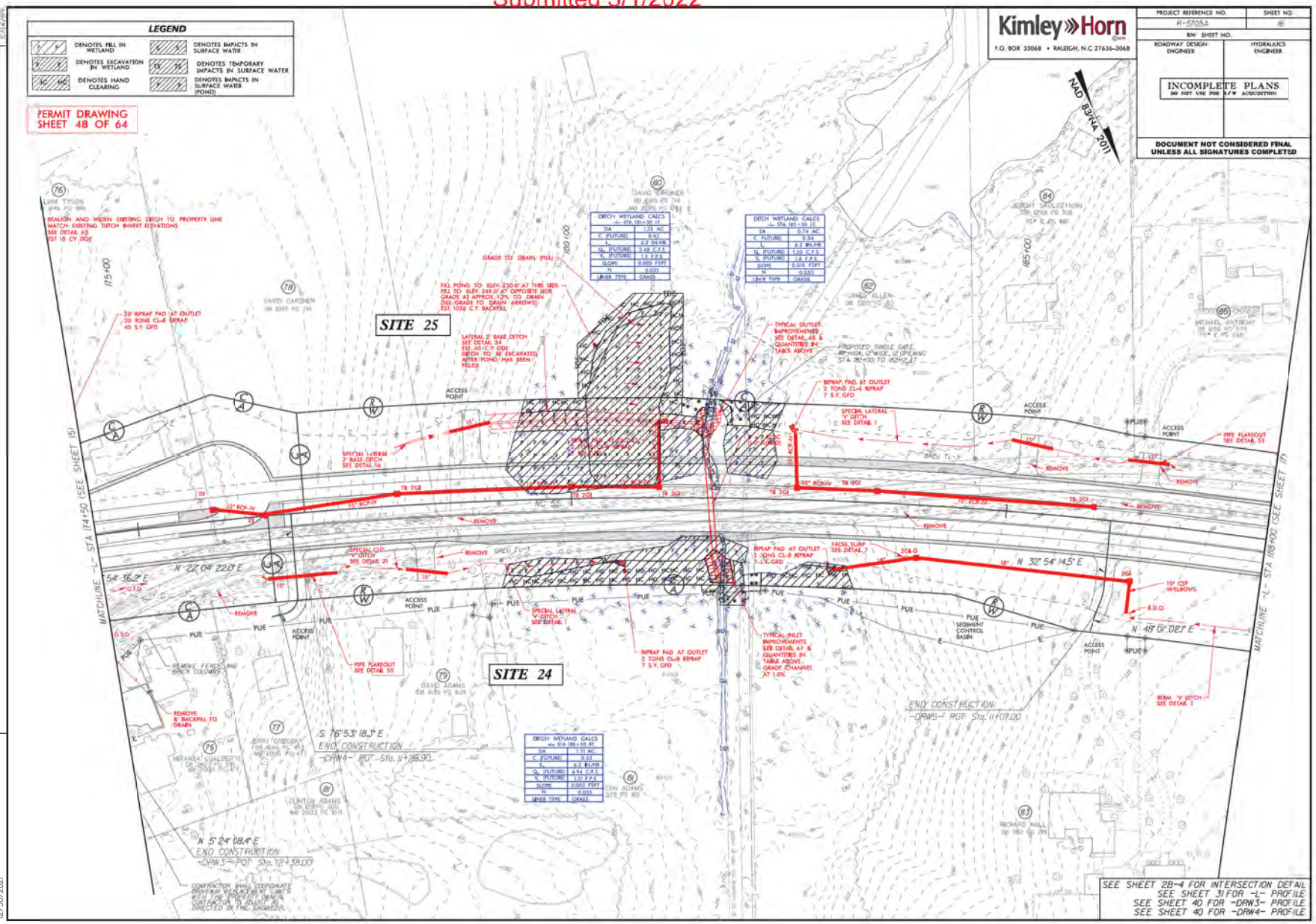
SHORENS

12/30/2021

Submitted 3/1/2022



REVISIONS

12/30/2021

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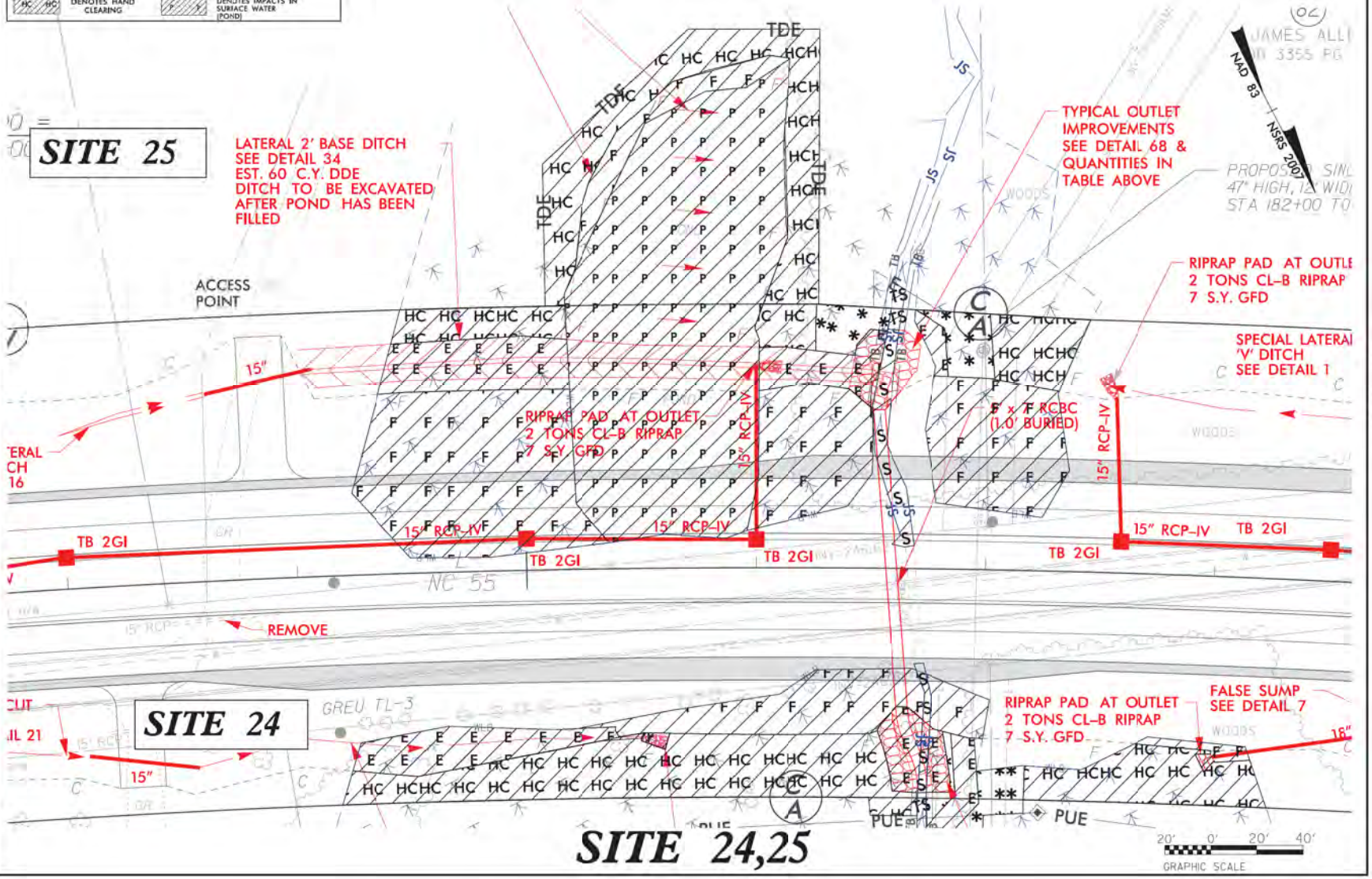
Submitted 3/1/2022

WETLAND AND STREAM IMPACTS

SITE IMPACT ZOOM: 1"=40'

PROJECT REFERENCE NO.	SHEET NO.
R-5705A	16A/B

PERMIT DRAWING
SHEET 49 OF 64



SITE 24,25

12/30/2021

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Submitted 3/1/2022

WETLAND AND STREAM IMPACTS

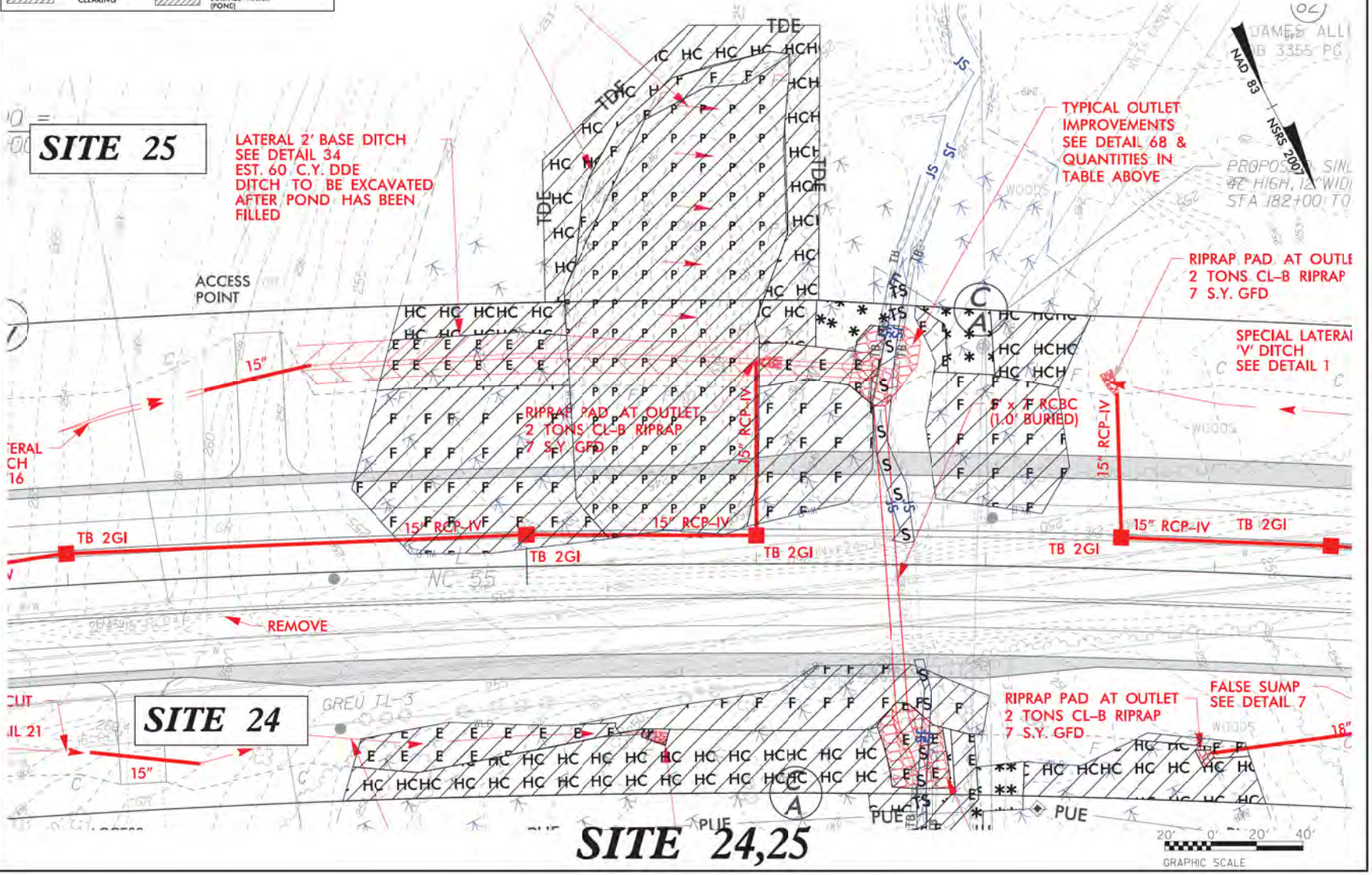
SITE IMPACT ZOOM: 1"=40'

PROJECT REFERENCE NO.	SHEET NO.
R-5705A	16A/B

PERMIT DRAWING
SHEET 50 OF 64

LEGEND

- DENOTES FILL IN WETLAND
- DENOTES EXCAVATION IN WETLAND
- DENOTES HAND CLEARING
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER (POND)



SITE 24,25

12/30/2021

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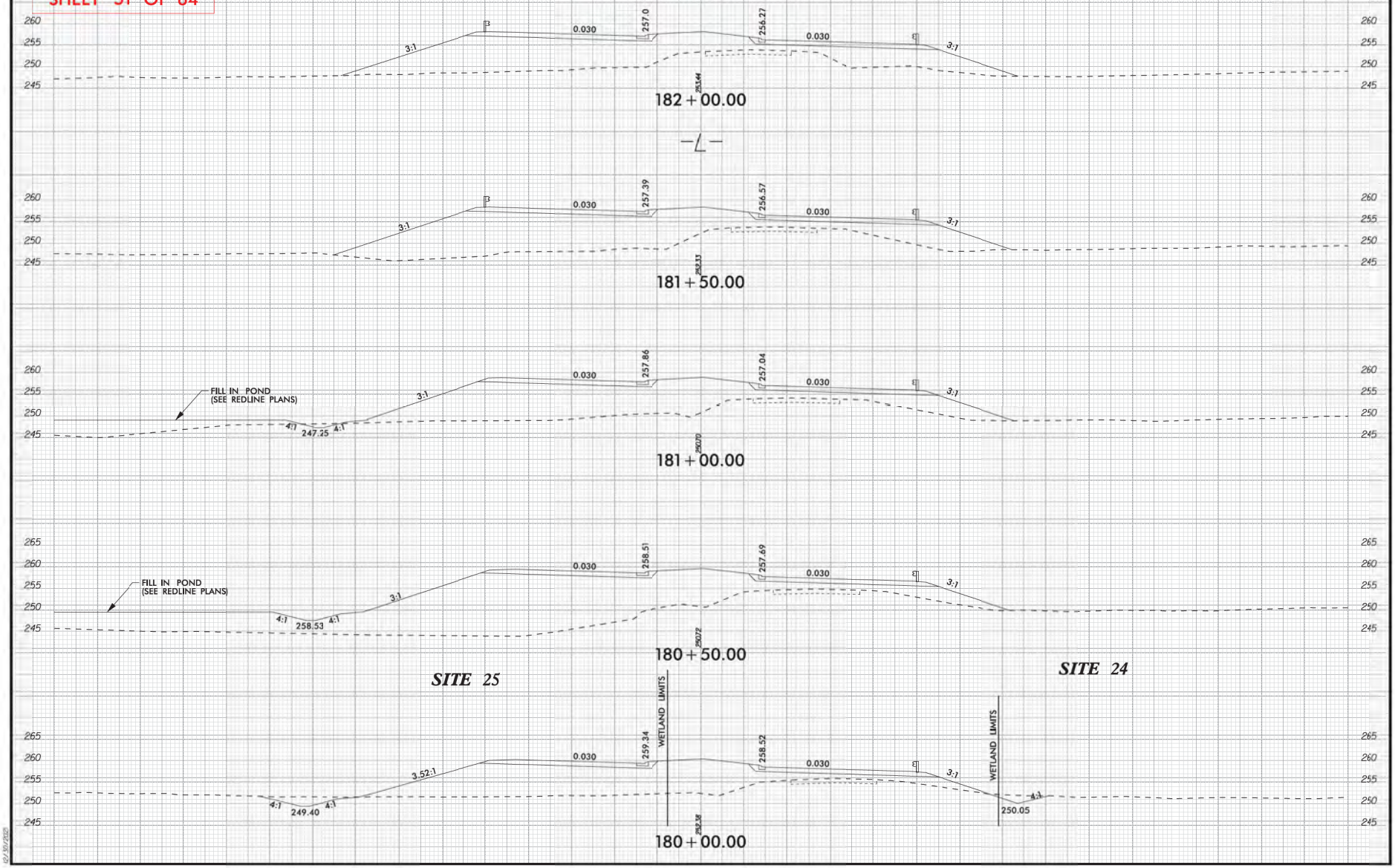
Submitted 3/1/2022

PERMIT DRAWING
SHEET 51 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



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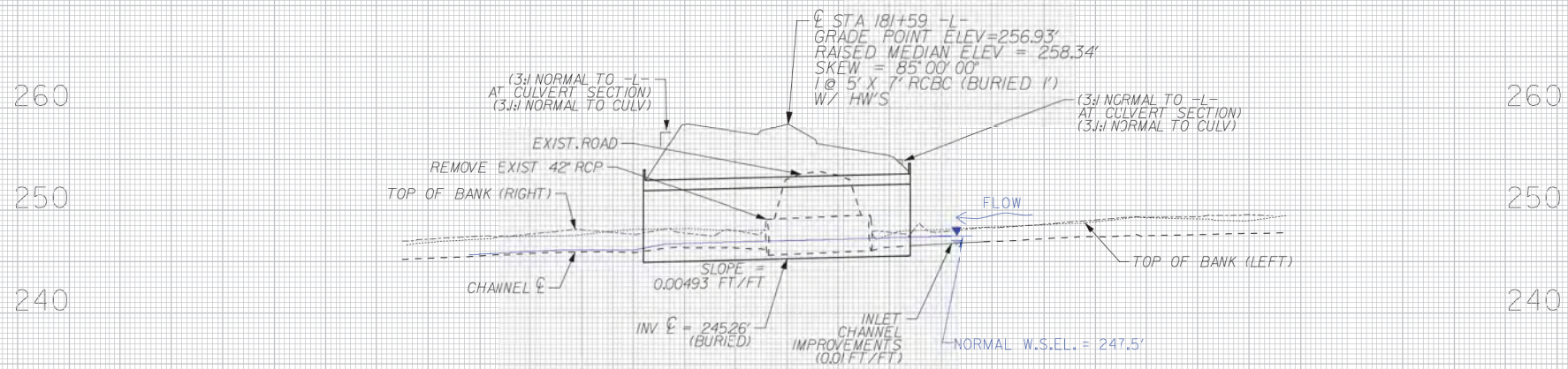
Submitted 3/1/2022

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -

PERMIT DRAWING
SHEET 52 OF 64

SITE 24,25



12/30/2021

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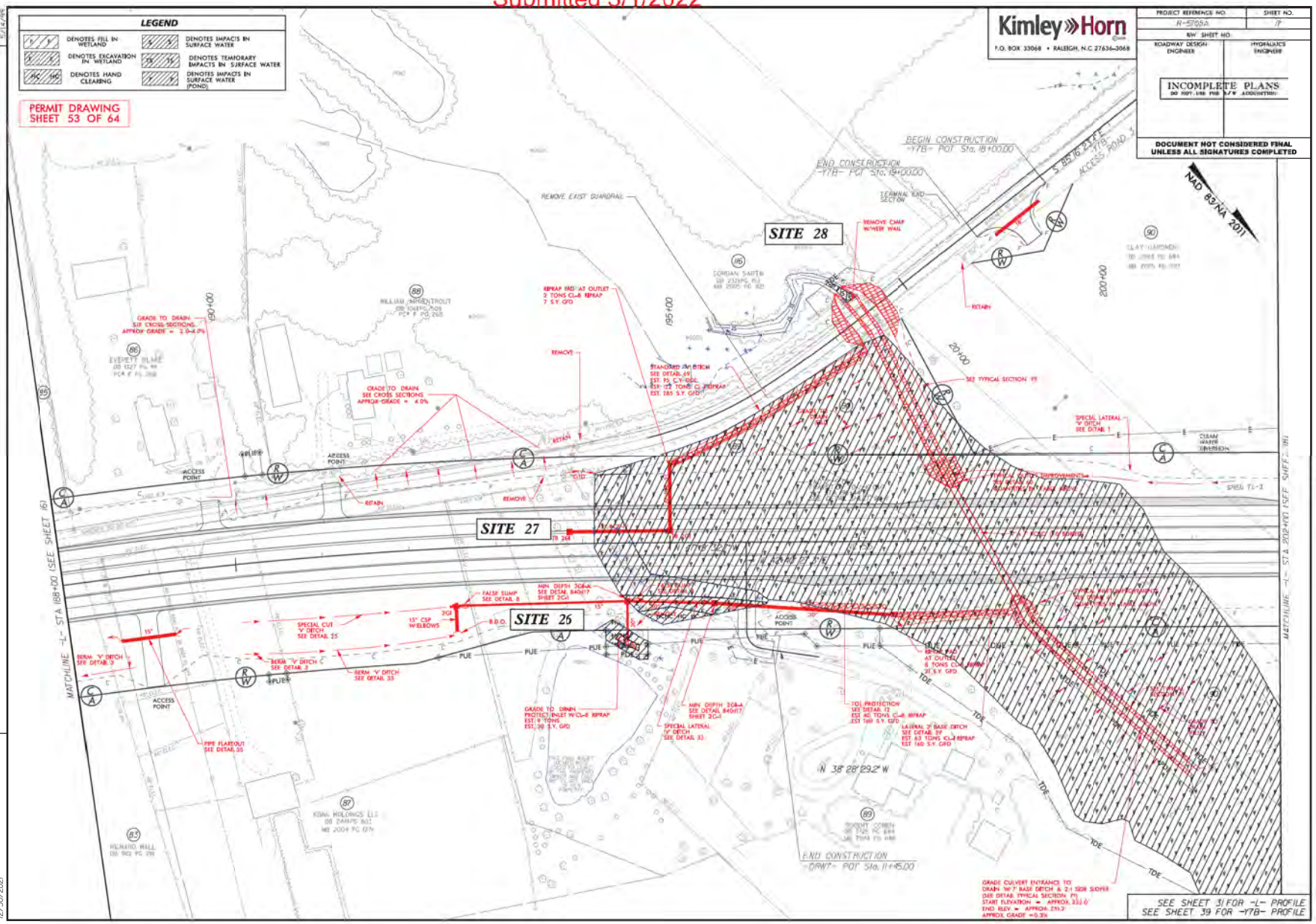
Submitted 3/1/2022



REVISIONS

12/30/2021

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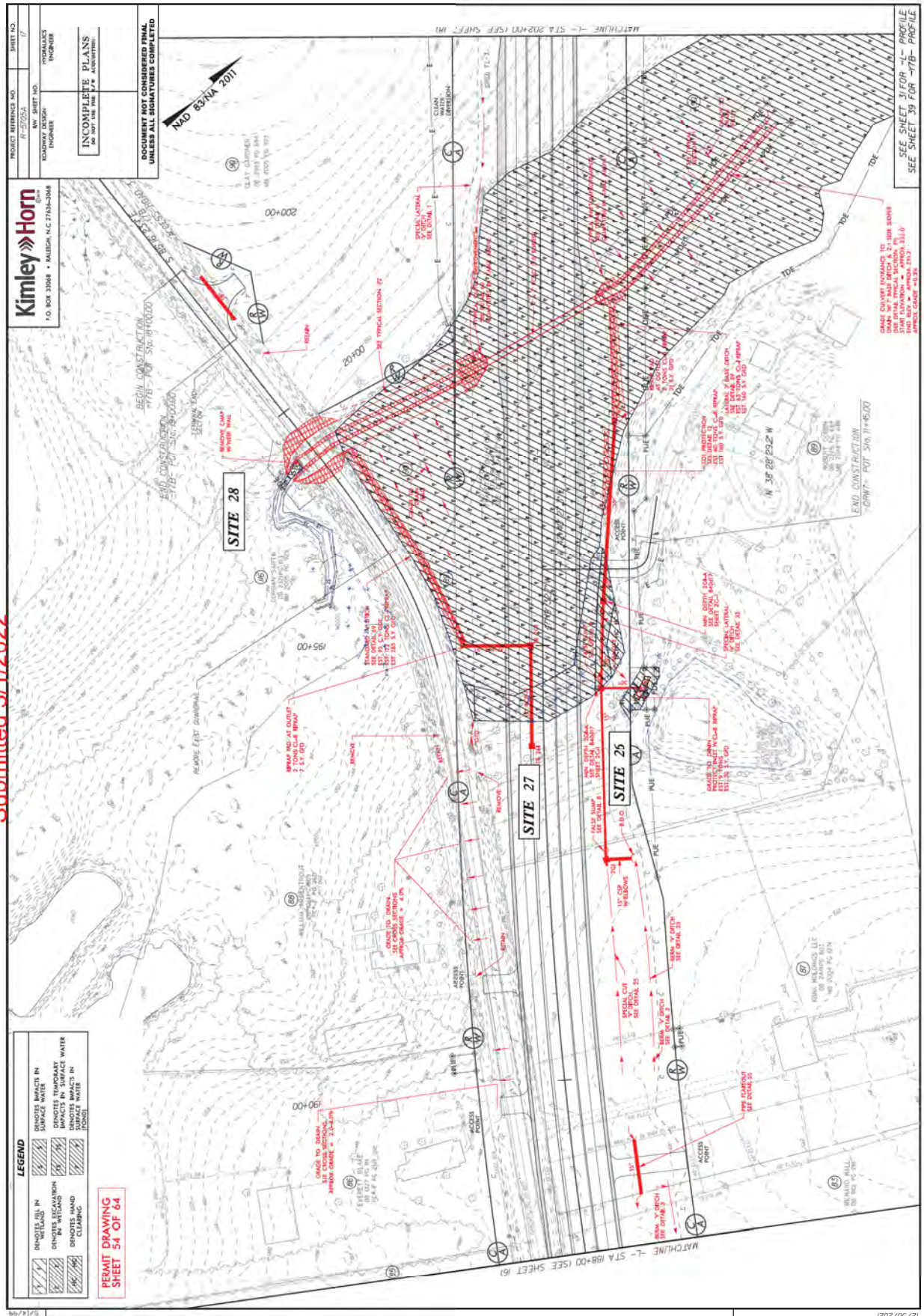
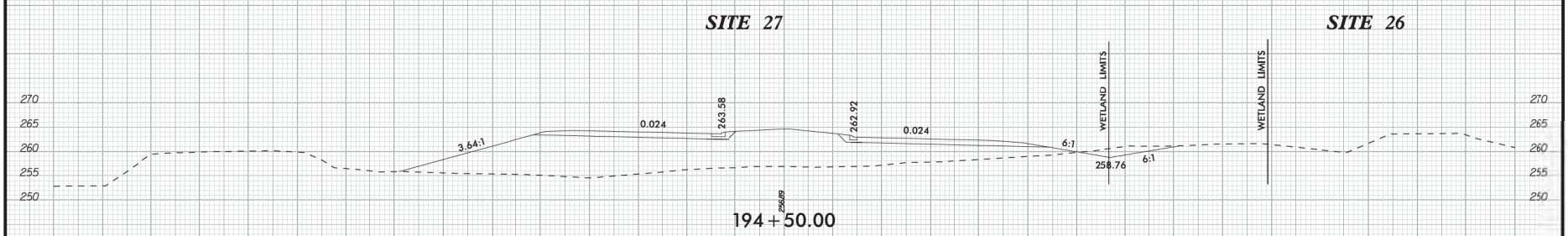

Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
PROJECT REFERENCE NO. R-5705A
SHEET NO. 17
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
SEE SHEET 31 FOR -L- PROFILE
SEE SHEET 39 FOR -TB- PROFILE
MATCHLINE -L- STA 202+00 (SEE SHEET 16)
MATCHLINE -L- STA 188+00 (SEE SHEET 16)
SITE 28
SITE 27
SITE 26
LEGEND
DENOTES FILL IN WETLAND
DENOTES EXCAVATION IN WETLAND
DENOTES HAND CLEARING
DENOTES IMPACTS IN WETLAND
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN SURFACE WATER (POND)
PERMIT DRAWING SHEET 54 OF 64
Submitted 3/1/2022
12/30/2021

Submitted 3/1/2022

PERMIT DRAWING
SHEET 55 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



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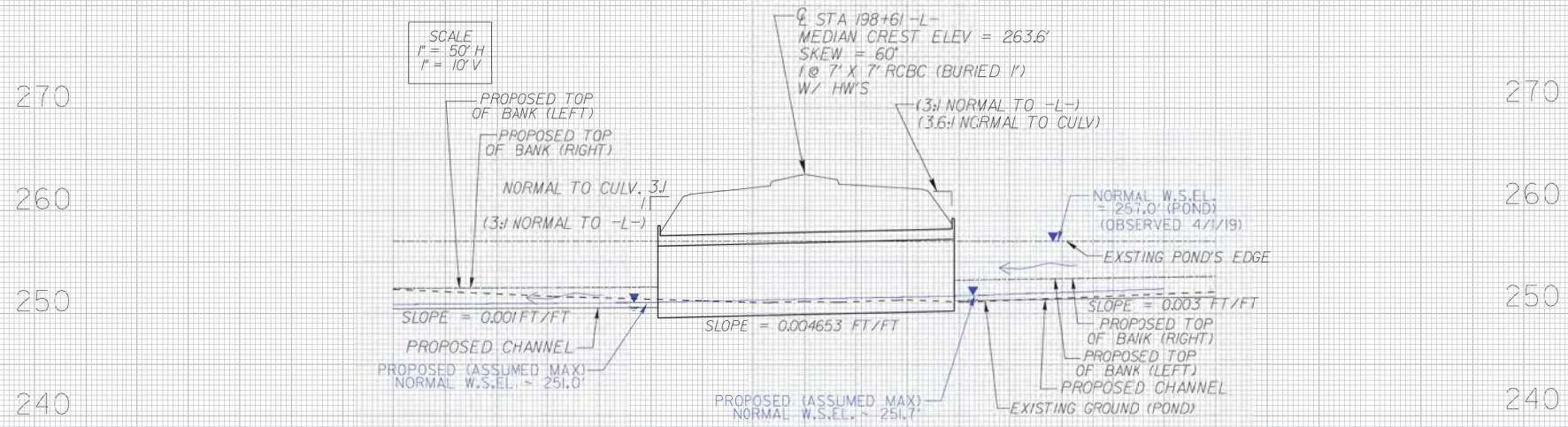
Submitted 3/1/2022

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -

PERMIT DRAWING
SHEET 56 OF 64

SITE 27,28



12/30/2021

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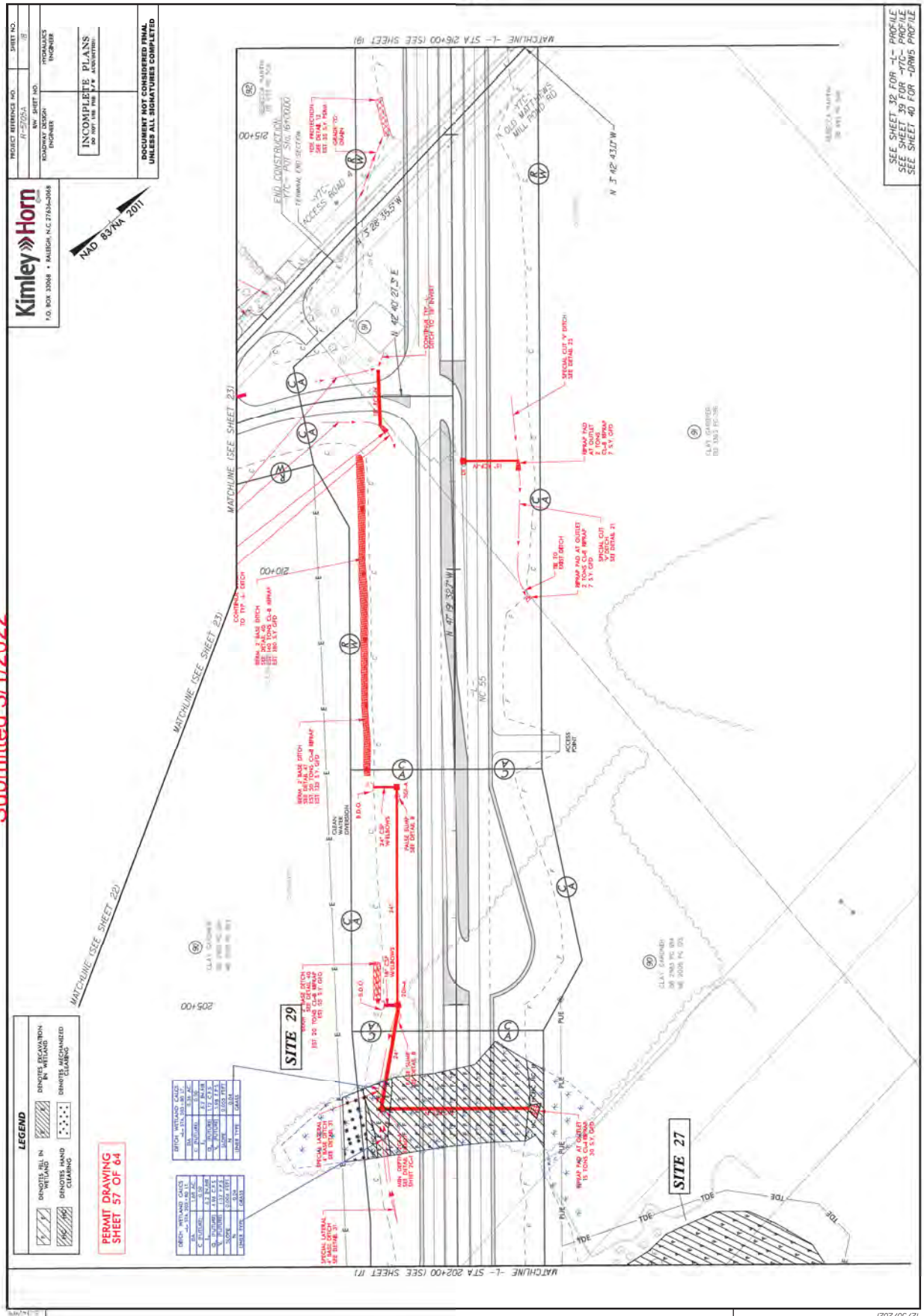
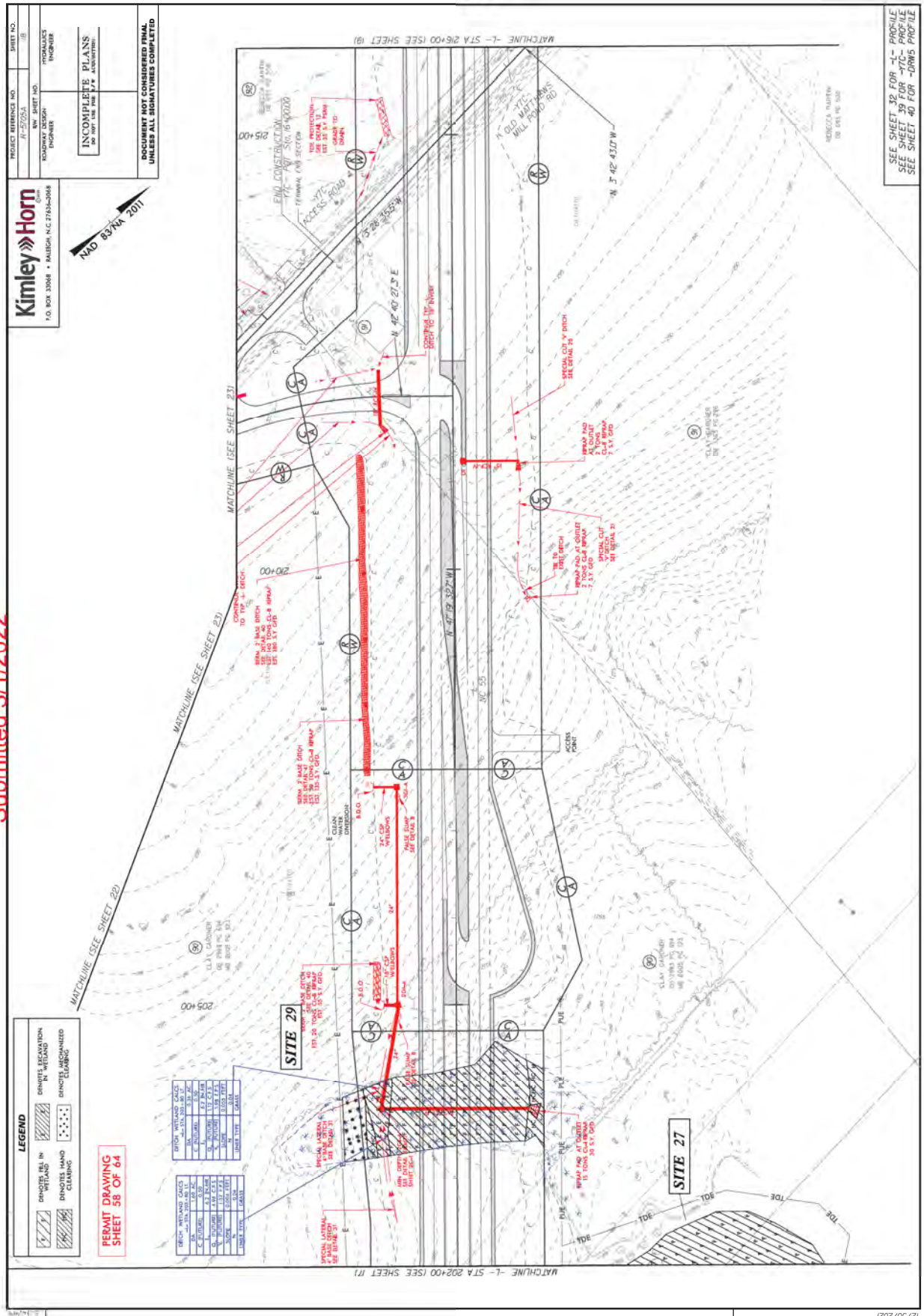

Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
PROJECT REFERENCE NO. R-5705A
SHEET NO. 18
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
SEE SHEET 32 FOR -L- PROFILE
SEE SHEET 39 FOR -YTC- PROFILE
SEE SHEET 40 FOR -DRN5 PROFILE
MATCHLINE -L- STA 216+00 (SEE SHEET 19)
MATCHLINE -L- STA 202+00 (SEE SHEET 17)
MATCHLINE (SEE SHEET 23)
MATCHLINE (SEE SHEET 22)
SITE 29
SITE 27
PERMIT DRAWING
SHEET 57 OF 64
LEGEND
DENOTES FILL IN WETLAND
DENOTES EXCAVATION IN WETLAND
DENOTES HAND CLEARING
DENOTES MECHANIZED CLEARING
Submitted 3/1/2022

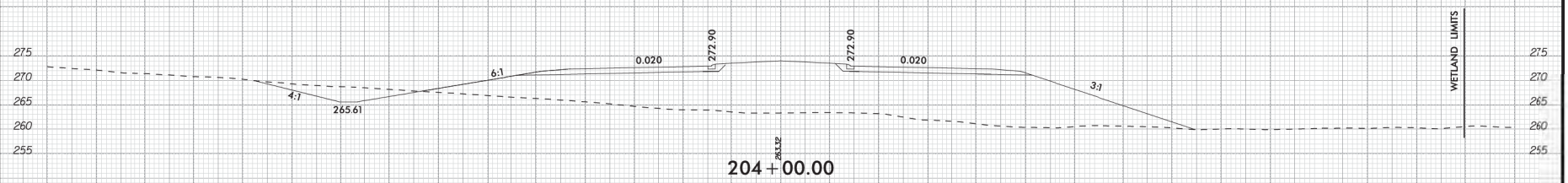
12/30/2021


Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
PROJECT REFERENCE NO. R-5705A
SHEET NO. 18
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
SEE SHEET 32 FOR -L- PROFILE
SEE SHEET 39 FOR -YTC- PROFILE
SEE SHEET 40 FOR -DRW5 PROFILE
MATCHLINE -L- STA 216+00 (SEE SHEET 19)
MATCHLINE -L- STA 202+00 (SEE SHEET 17)
MATCHLINE (SEE SHEET 23)
MATCHLINE (SEE SHEET 22)
END CONSTRUCTION
-YTC- PT STA 16+00.00
TERMINAL END SECTION
ACCESS ROAD
OLD MATTAMUSKEET MILL POND RD
N 42° 40' 27.5" E
N 41° 19' 32.7" W
N 3° 42' 43.1" W
S 28° 35' 55" W
SITE 29
SITE 27
LEGEND
DENOTES FILL IN WETLAND
DENOTES EXCAVATION IN WETLAND
DENOTES HAND CLEARING
DENOTES MECHANIZED CLEARING
PERMIT DRAWING SHEET 58 OF 64
Submitted 3/1/2022
12/30/2021

Submitted 3/1/2022

PERMIT DRAWING
SHEET 59 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



12/30/2021

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Submitted 3/1/2022

LEGEND

F / F — DENOTES FILL IN WETLAND	S / S — DENOTES IMPACTS IN SURFACE WATER
HC / HC — DENOTES HAND CLEARING	TS / TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 60 OF 64

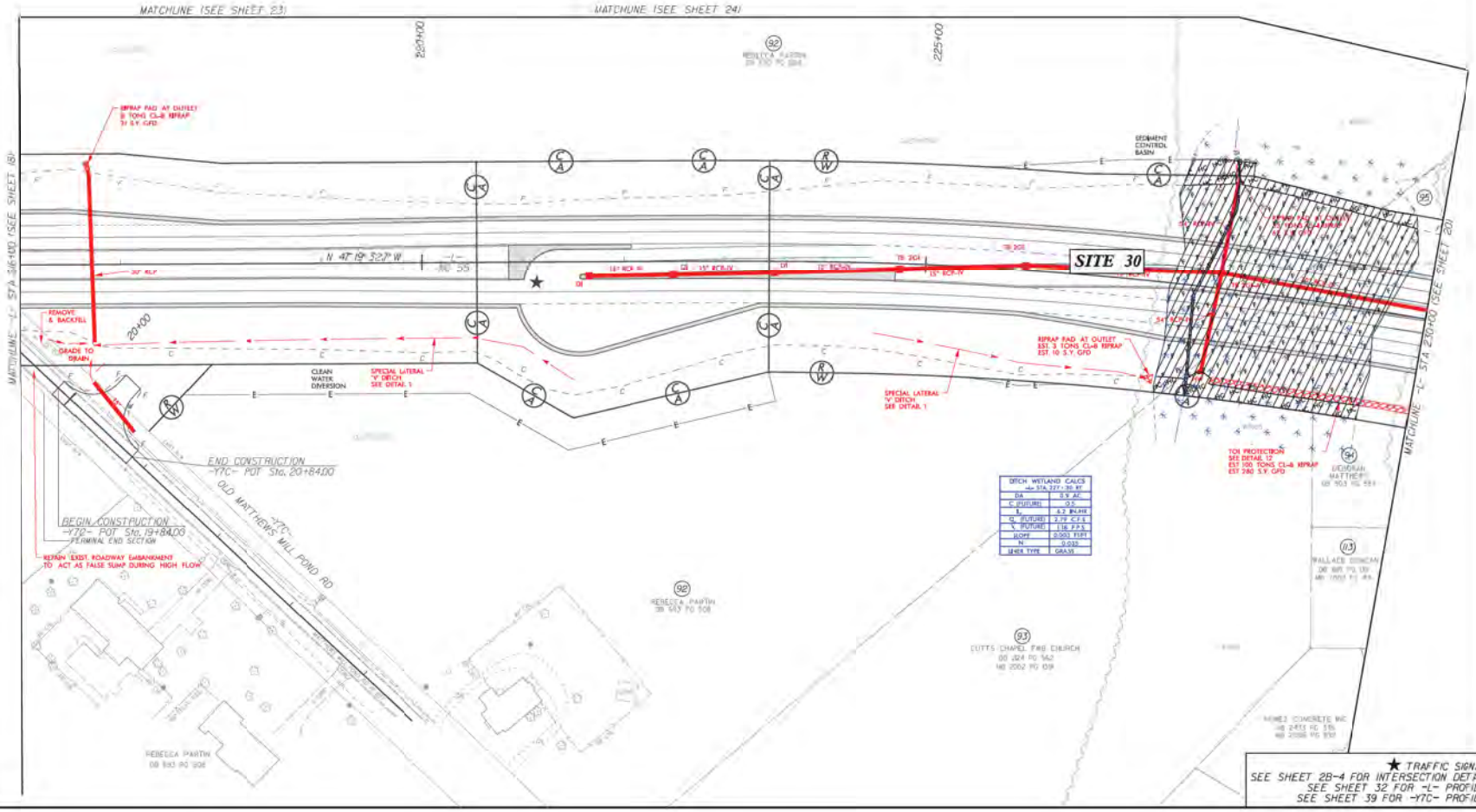
Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068

PROJECT REFERENCE NO.	SHEET NO.
R-5705A	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011



DITCH WETLAND CALCS	
STA 227+30 RT	
DA	3.3 AC
C (FUTURE)	0.5
I_a	5.2 IN/HR
Q (FUTURE)	2.79 CFS
V (FUTURE)	1.16 FPS
SLOPE	0.003 FT/FT
N	0.035
LINER TYPE	GRASS

★ TRAFFIC SIGNAL
SEE SHEET 2B-4 FOR INTERSECTION DETAIL
SEE SHEET 32 FOR -L- PROFILE
SEE SHEET 39 FOR -YTC- PROFILE

REVISIONS

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Submitted 3/1/2022

LEGEND

- DENOTES FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES HAND CLEARING
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 61 OF 64

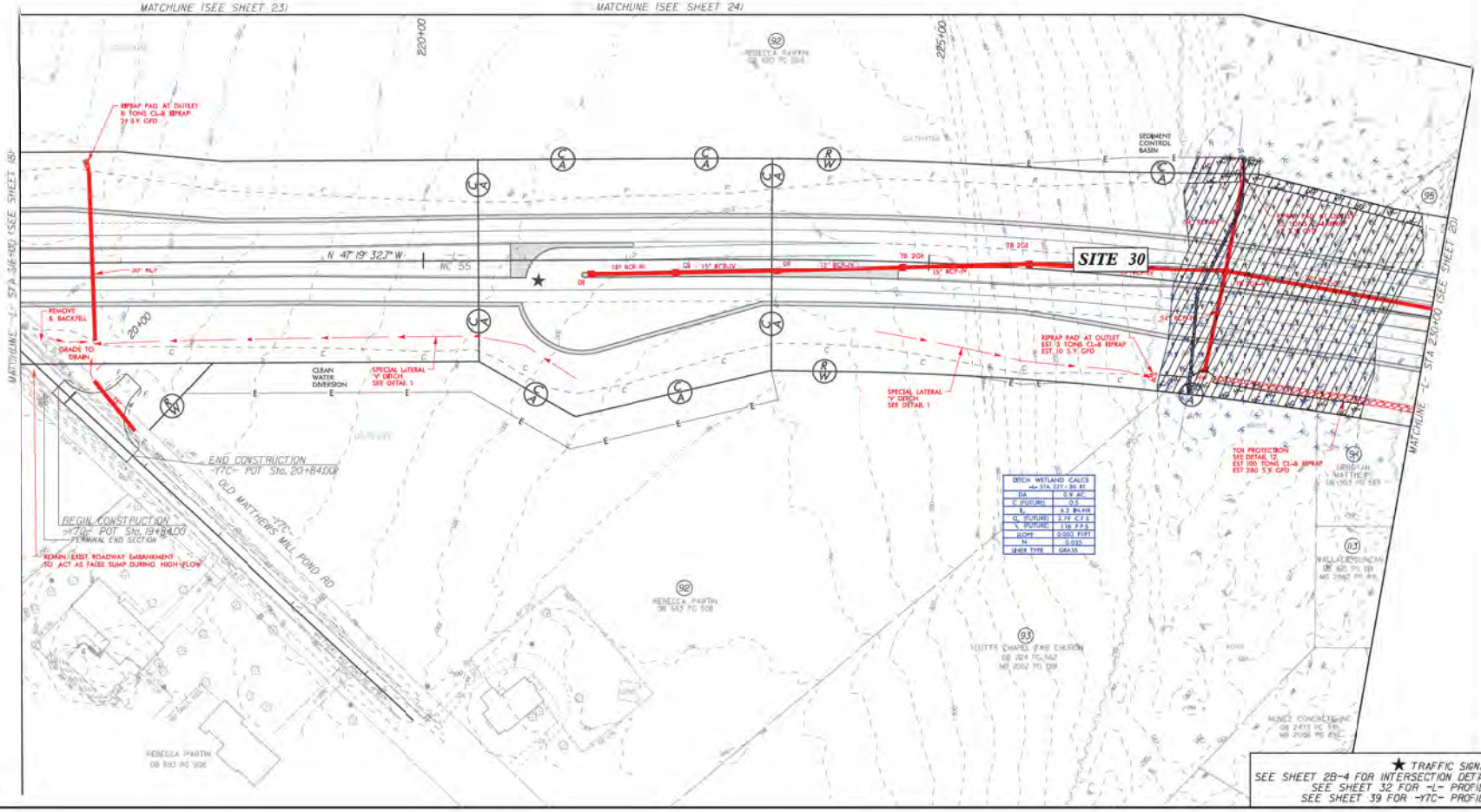
Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C 27636-3068

PROJECT REFERENCE NO.	SHEET NO.
R-5705A	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011



★ TRAFFIC SIGNAL
SEE SHEET 2B-4 FOR INTERSECTION DETAIL
SEE SHEET 32 FOR -L- PROFILE
SEE SHEET 39 FOR -YC- PROFILE

REVISIONS

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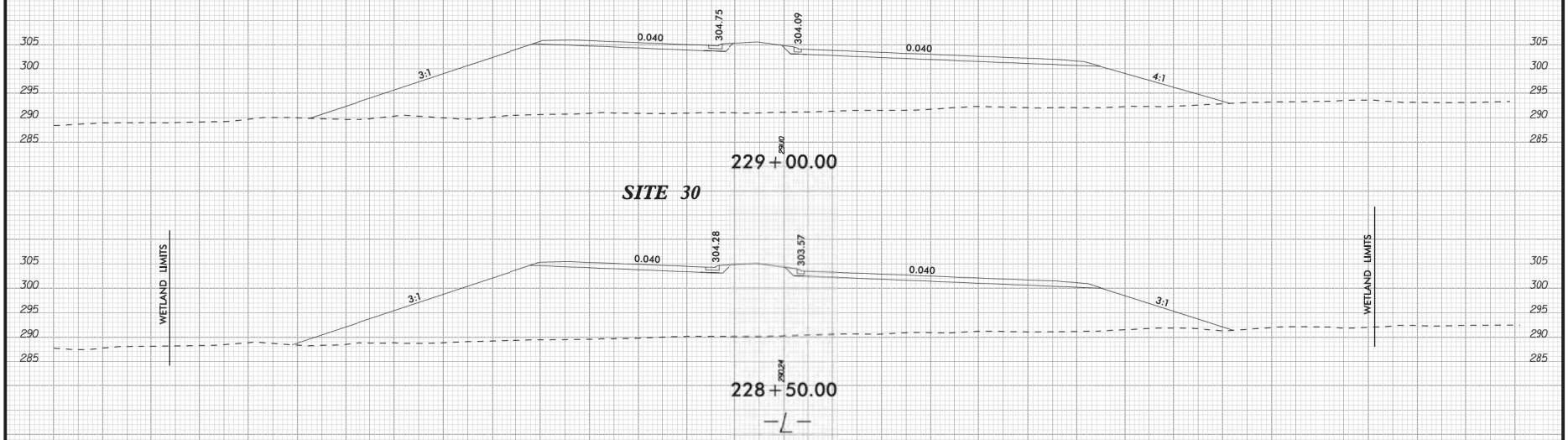
Submitted 3/1/2022

PERMIT DRAWING
SHEET 62 OF 64

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET - 0F -



12/30/2021

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Submitted 3/1/2022

WETLAND AND SURACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 16+20 to 16+40 LT/RT	24" RCP					< 0.01		< 0.01		30	
2	-L- 23+03 to 24+16 LT/RT	6' x 7' RCBC	0.02		< 0.01		0.03	< 0.01	< 0.01	34	10	
3	-L- 24+28 to 24+54 RT	Roadway Fill						0.01	< 0.01	116	10	
4	-L- 24+54 to 24+83 RT	6' x 7' RCBC	0.22		0.10	0.07	0.06	< 0.01		51		
4	-L- 24+83 to 25+09 RT	Bank Stabilization						< 0.01	< 0.01	49	10	
5	-L- 37+97 to 38+48 RT	24" RCP	0.05				0.01					
6	-L- 42+50 to 44+74 RT	42" RCP						0.05	< 0.01	268	30	
7	-L- 44+74 to 45+04 RT	42" RCP						< 0.01	< 0.01	30		
8	-L- 44+50 to 49+00 LT	42" RCP						0.95				
9	-L- 76+77 to 77+38 RT	24" RCP	0.04				< 0.01					
10	-L- 80+58 to 81+90 RT	Roadway Fill	0.09		0.05		0.04					
11	-L- 82+04 to 91+50 RT	Roadway Fill	1.11		0.10		0.35	0.01	< 0.01	224	86	
12	-L- 89+35 to 92+38 LT	54" RCP	0.09	0.91	0.04		0.09					
13	-L- 94+02 to 94+88 LT	Roadway Fill					0.02					
14	-L- 98+38 to 99+24 RT	Roadway Fill	< 0.01				0.02					
15	-L- 106+38 to 113+76 LT/RT	48" RCP	0.97		0.34		0.32	< 0.01	< 0.01	102	35	
15	-L- 106+38 to 113+76 LT/RT	48" RCP						0.21				
16	-Y4A- 18+96 to 19+58 RT	48" RCP			< 0.01		0.02	0.01	< 0.01	57	9	
17	-L- 127+00 to 130+67 RT/LT	Roadway Fill	0.66		0.06		0.17					
18	-L- 132+03 to 132+13 RT	48" RCP						< 0.01	< 0.01	41	7	
19	-L- 136+18 to 140+48 RT	Roadway Fill	0.05				0.01					
19	-L- 136+18 to 140+48 RT	Roadway Fill						0.23				
20	-L- 153+56 to 154+84 RT/LT	66" RCP	0.08		0.06	0.02	0.02	0.04	< 0.01	204	31	
20	-L- 154+84 LT	Bank Stabilization						< 0.01	< 0.01	12	14	
TOTALS*:			3.36	0.91	0.76	0.09	1.17	1.53	0.03	1186	270	0

*Rounded totals are sum of actual impacts

NOTES:

0.055 acres of mechanized clearing on Site 4 is for clean water diversion erosion control feature

0.008 acres of mech. clearing on Site 4 is for temporary excavation associated with a temporary pipe for culvert phasing (shown as "E" hatching on plans but quantified as mechanized clearing in this table)

0.91 acres of temporary fill in wetland on Site 12 is being used to quantify the impact for the potential that the ponded water in the wetland will need to be temporarily drained during construction

Revised 2018 Feb

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
09-13-2021
Harnett
R-5705A
46377.1.2
SHEET 63 OF 64

Submitted 3/1/2022

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
21	-L- 161+48 to 162+68 RT	36" RCP	0.06		0.04		0.03					
22	-L- 162+58 to 162+77 LT	36" RCP	0.04		0.03		< 0.01					
23	-L- 173+93 to 174+24 LT	30" RCP	0.02		0.02		0.02					
24	-L- 179+18 to 183+23 RT	5' x 7' RCBC	0.07		0.05	0.03	0.17	0.02	< 0.01	154	33	
25	-L- 179+25 to 182+36 LT	5' x 7' RCBC	0.31		0.06	0.03	0.16					
25	-L- 179+25 to 182+36 LT	5' x 7' RCBC						0.35				
26	-L- 194+11 to 194+75 RT	30" RCP	< 0.01				0.02					
27	-L- 194+13 to 202+60 RT/LT	Roadway Fill	0.18		0.05	< 0.01	0.02					
27	-L- 194+13 to 202+60 RT/LT	7' x 7' RCBC						5.05				
28	-Y7B- 20+53 to 20+69 RT	Bank Stabilization						< 0.01	< 0.01	19	15	
29	-L- 203+22 to 204+58 RT/LT	36" RCP	0.35		0.04	0.05	0.04					
30	-L- 227+38 to 229+82 RT/LT	54" RCP	0.96				0.14	0.02	< 0.01	224	20	
SHEET TOTALS*:			1.99		0.29	0.11	0.61	5.44	< 0.01	397	68	0
PROJECT TOTALS*:			5.35	0.91	1.05	0.20	1.78	6.97	0.03	1583	338	

*Rounded totals are sum of actual impacts

NOTES:

0.006 Acres of mechanized clearing on site 27 represents remnant wetland piece which will have significantly less supporting hydrology post-construction. The plans still call for hand clearing per guidance from 4B meeting

0.004 acres of mechanized clearing on Site 20 is for temporary excavation associated with culvert construction and phasing (shown as "E" hatching on plans but quantified as mechanized clearing in this table)

0.012 acres of mechanized clearing on Site 24 is for temporary excavation associated with culvert construction and phasing (shown as "E" hatching on plans but quantified as mechanized clearing in this table)

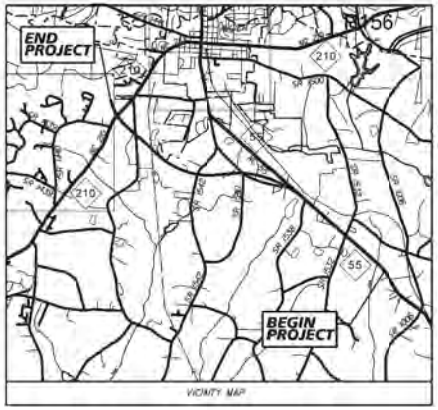
0.005 acres of mechanized clearing on Site 25 is for temporary excavation associated with culvert construction and phasing (shown as "E" hatching on plans but quantified as mechanized clearing in this table)

Revised 2018 Feb

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
REV 02/24/2022
Harnett
R-5705A
46377.1.2

Submitted 12/21/2021

TIP PROJECT: R-5705A



65% PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY ENVIRONMENTAL PERMIT PLANS
HARNETT COUNTY

LOCATION: NC 55 FROM SOUTH OF SR 1532 (OAK GROVE CHURCH ROAD) TO NORTH OF NC 210

TYPE OF WORK: AERIAL AND UNDERGROUND RELOCATIONS OF WATER, SANITARY SEWER, POWER AND COMMUNICATIONS LINES

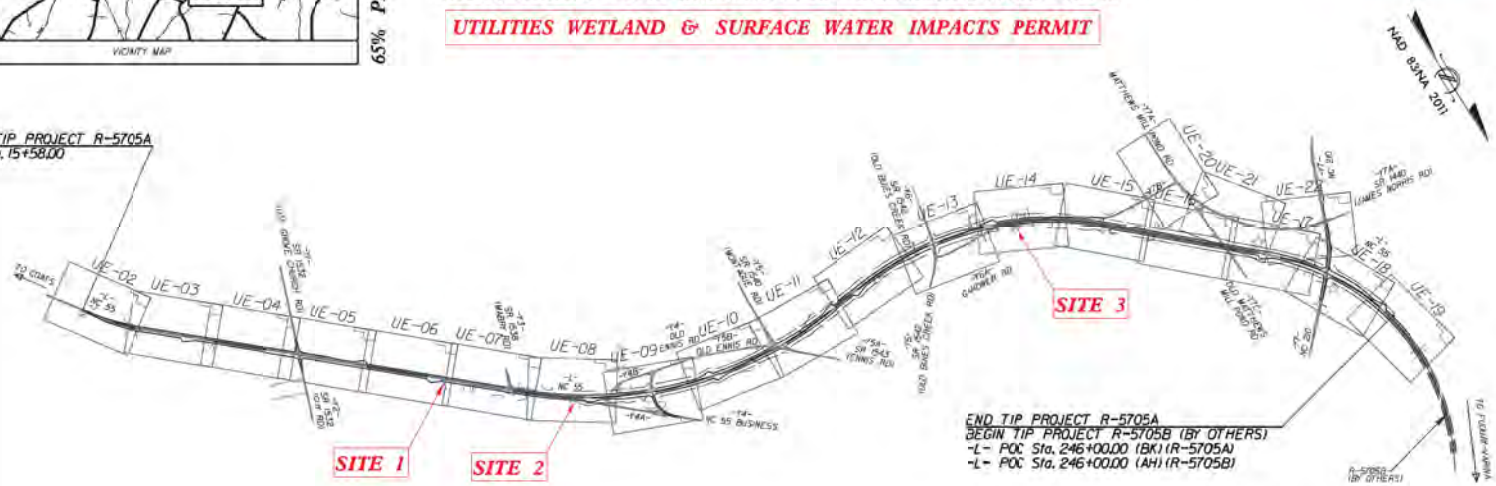
UTILITIES WETLAND & SURFACE WATER IMPACTS PERMIT

T.I.P. NO.	SHEET NO.
R-5705A	UE-01

NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

PERMIT DRAWING
SHEET 1 OF 14

PRELIMINARY



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UE-1	TITLE SHEET
UE-02 THRU UE-22	ENVIRONMENTAL PERMIT PLAN SHEETS

UTILITY OWNERS WITH CONFLICTS

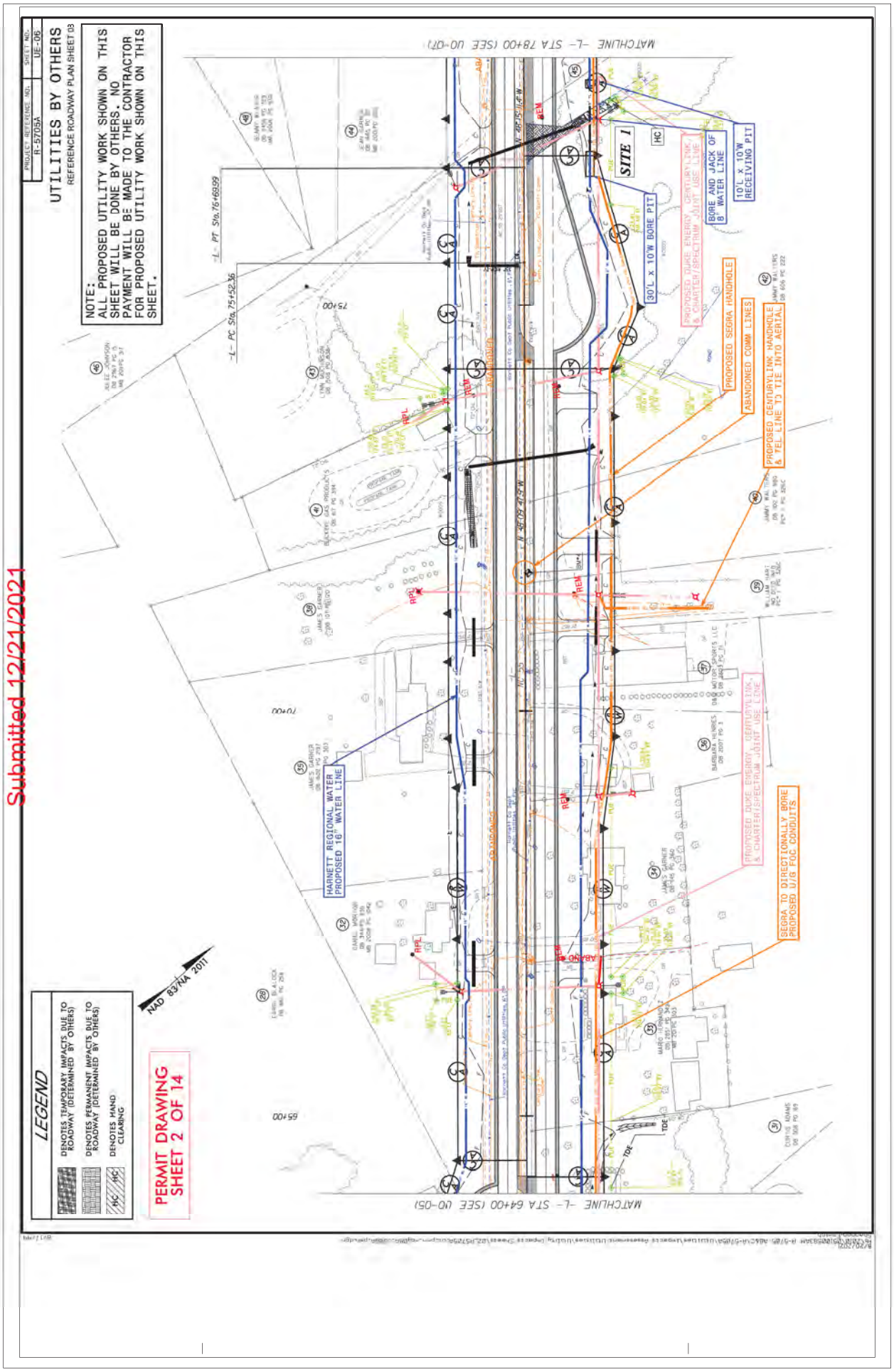
(A) POWER - DUKE ENERGY
(B) COMMUNICATIONS - CHARTER
(C) WATER - HARNETT REGIONAL WATER
(D) TOWN OF ANGIER

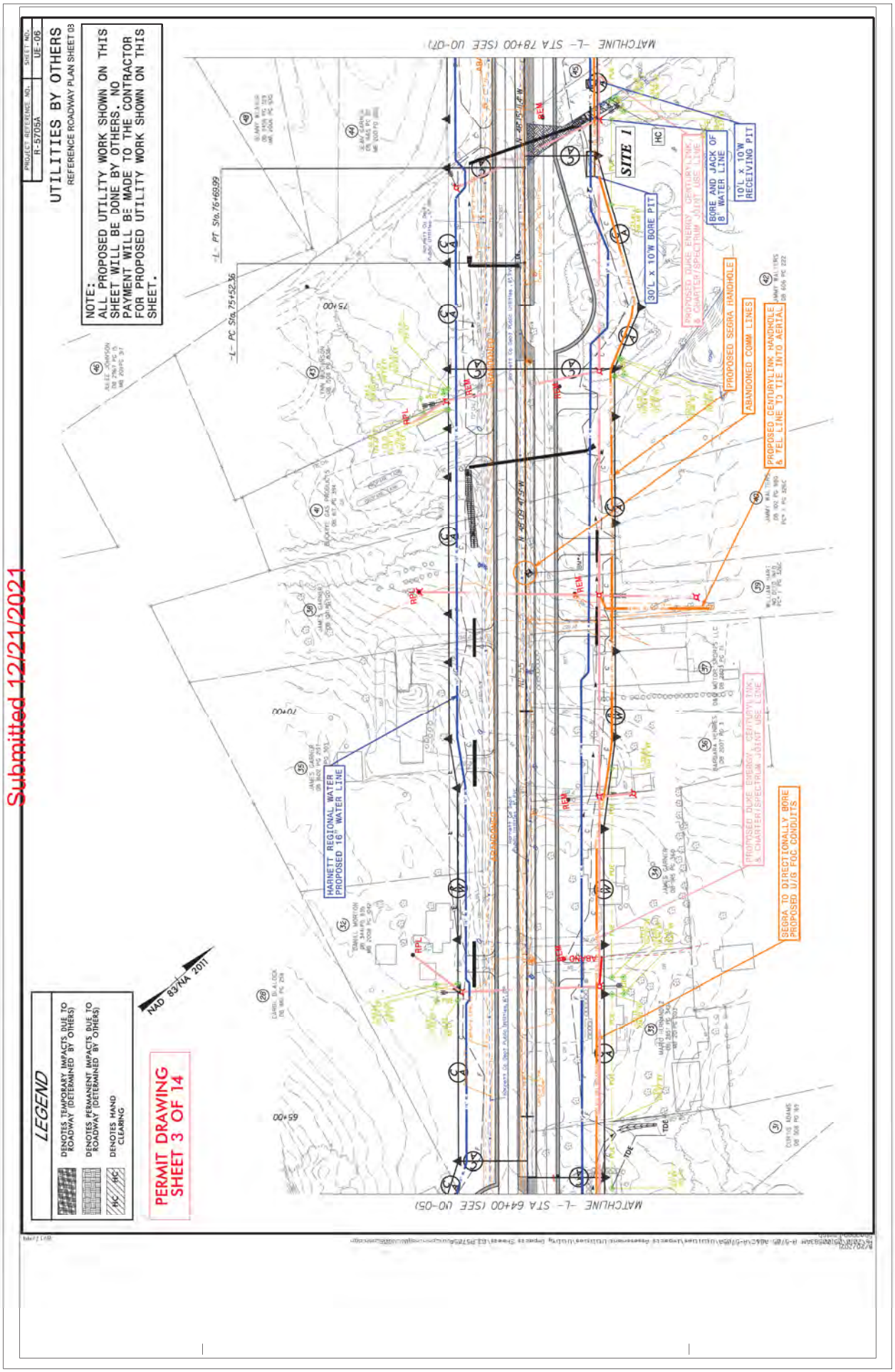
PREPARED IN THE OFFICE OF:
KCI Associates of N.C., P.A.
4505 Falls of Neuse Road, Suite 400
Raleigh, NC 27609
Phone (919) 783-9214
Fax (919) 783-9266

JOHN FAISON — UTILITY PROJECT MANAGER
L. KELSEY BARTLETT — PROJECT UTILITY COORDINATOR
DANIEL ALLEN — PROJECT UTILITY DESIGNER IN TRAINING

DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 BIRCH SERVICE CENTER
RALEIGH, NC 27699

KELVIN MARTIN — UTILITY ENGINEER
VACANT — UTILITY AREA COORDINATOR
KELVIN MARTIN — UTILITY COORDINATOR


PROJECT REFERENCE NO.
R-5705A
SHEET NO.
UE-06
UTILITIES BY OTHERS
REFERENCE ROADWAY PLAN SHEET 03
NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.
MATCHLINE -L- STA 78+00 (SEE U0-07)
MATCHLINE -L- STA 64+00 (SEE U0-05)
-L- PT Sta.76+69.99
-L- PC Sta.75+52.36
SITE 1
30'L x 10'W BORE PIT
10'L x 10'W RECEIVING PIT
BORE AND JACK OF 8" WATER LINE
PROPOSED DUKE ENERGY, CENTURYLINK, & CHARTER/SPECTRUM JOINT USE LINE
PROPOSED SEGRA HANDHOLE
ABANDONED COMM LINES
PROPOSED CENTURYLINK HANDHOLE & TEL LINE TO TIE INTO AERIAL
HARNETT REGIONAL WATER PROPOSED 16" WATER LINE
SEGRA TO DIRECTIONALLY BORE PROPOSED U/G FOC CONDUITS
LEGEND
DENOTES TEMPORARY IMPACTS DUE TO ROADWAY (DETERMINED BY OTHERS)
DENOTES PERMANENT IMPACTS DUE TO ROADWAY (DETERMINED BY OTHERS)
DENOTES HAND CLEARING
NAD 83/NA 2011
PERMIT DRAWING
SHEET 2 OF 14
Submitted 12/21/2021


PROJECT REFERENCE NO.
R-5705A
SHEET NO.
UE-06
UTILITIES BY OTHERS
REFERENCE ROADWAY PLAN SHEET 03
NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.
-L- PC Sta.75+52.36
-L- PT Sta.76+69.99
MATCHLINE -L- STA 78+00 (SEE U0-07)
MATCHLINE -L- STA 64+00 (SEE U0-05)
SITE 1
30'L x 10'W BORE PIT
10'L x 10'W RECEIVING PIT
BORE AND JACK OF 8" WATER LINE
PROPOSED DUKE ENERGY & CHARTER/SPECTRUM JOINT USE LINE
PROPOSED SEGRA HANDHOLE
ABANDONED COMM LINES
PROPOSED CENTURYLINK HANDHOLE & TEL LINE TO TIE INTO AERIAL
HARNETT REGIONAL WATER PROPOSED 16" WATER LINE
SEGRA TO DIRECTIONALLY BORE PROPOSED U/G FOC CONDUITS
LEGEND
DENOTES TEMPORARY IMPACTS DUE TO ROADWAY (DETERMINED BY OTHERS)
DENOTES PERMANENT IMPACTS DUE TO ROADWAY (DETERMINED BY OTHERS)
DENOTES HAND CLEARING
NAD 83/NA 2011
PERMIT DRAWING
SHEET 3 OF 14
Submitted 12/21/2021

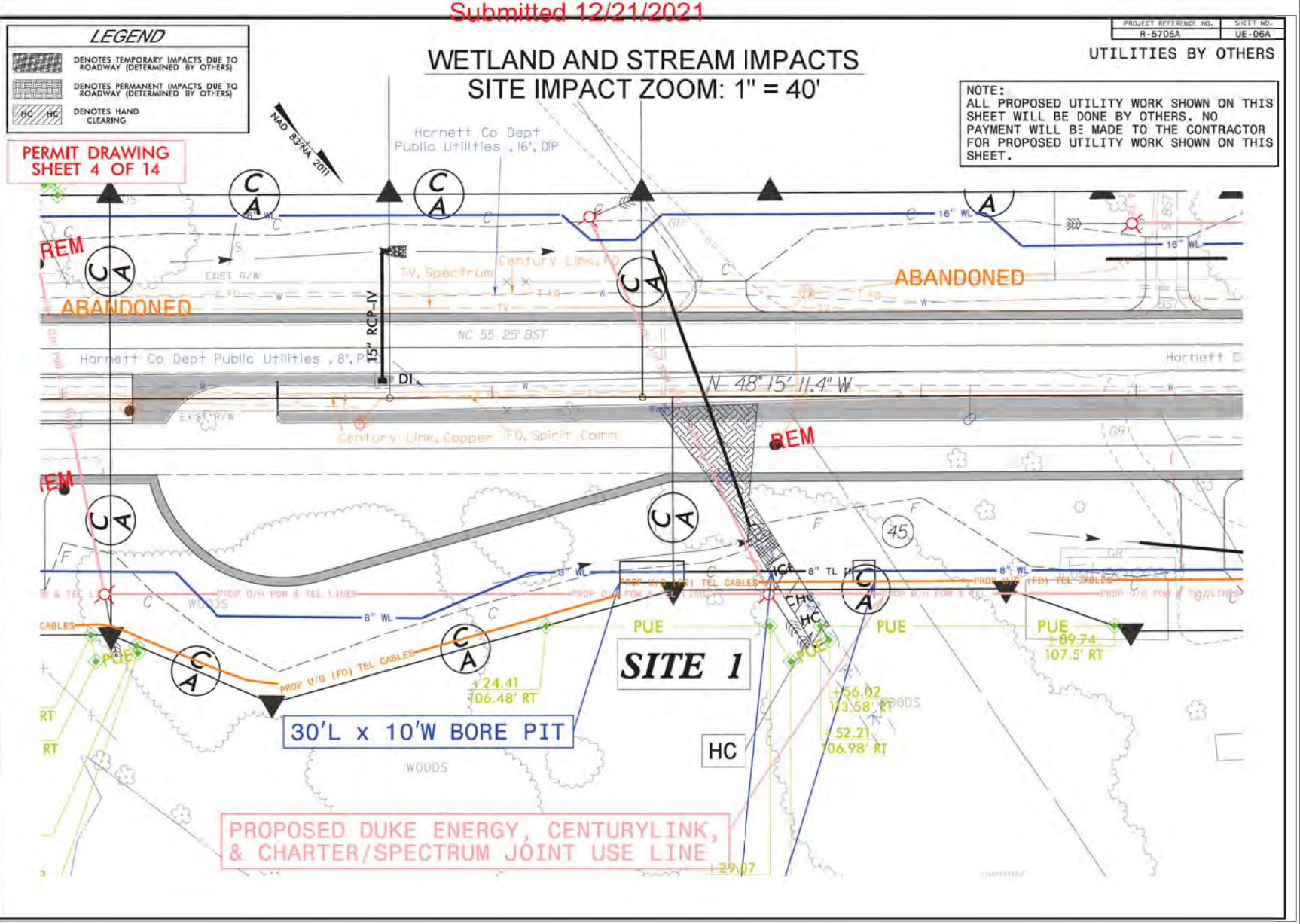
Submitted 12/21/2021

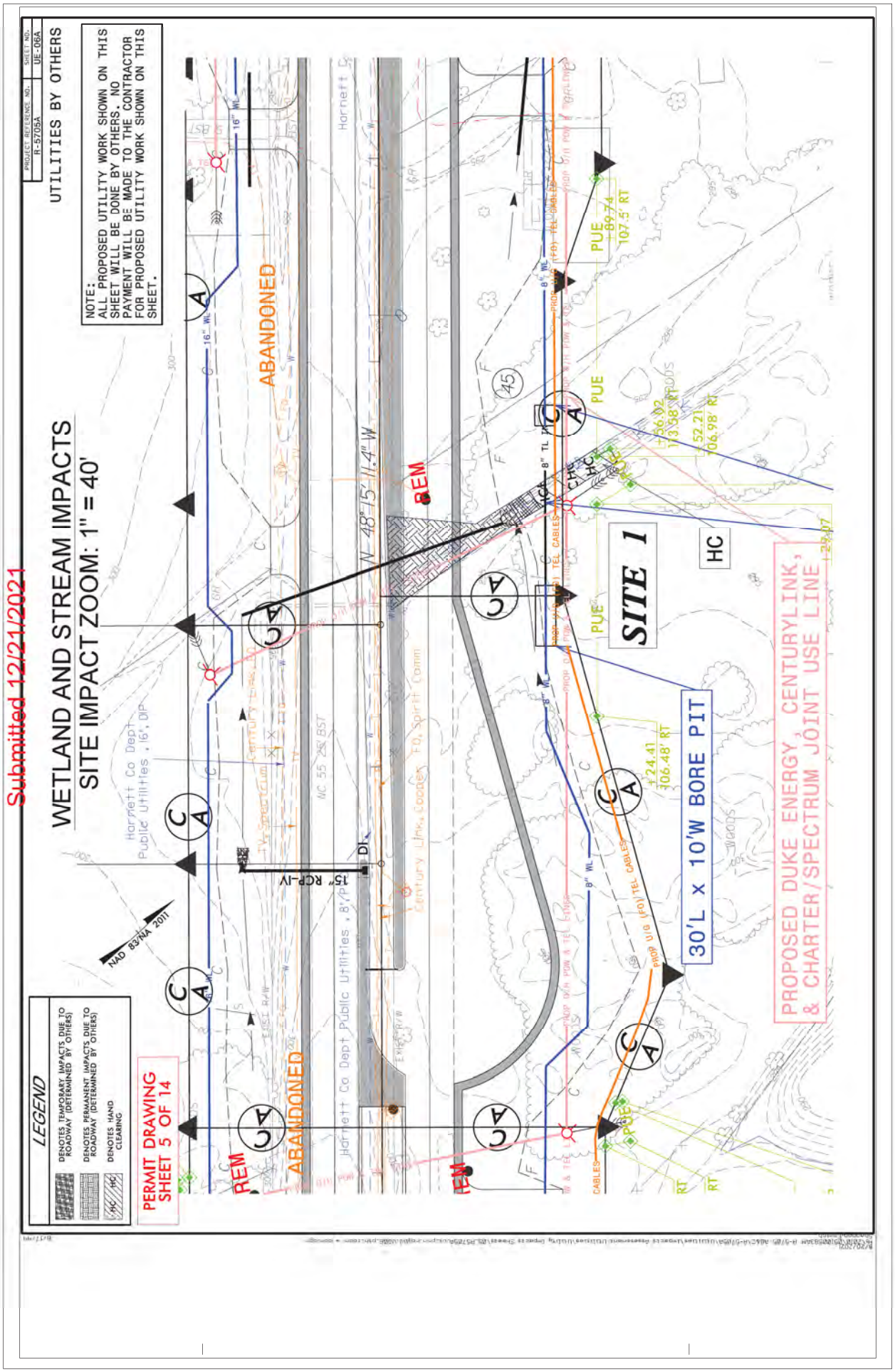
PROJECT REFERENCE NO.	SHEET NO.
R-5705A	UE-06A

UTILITIES BY OTHERS

WETLAND AND STREAM IMPACTS
SITE IMPACT ZOOM: 1" = 40'

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.




Submitted 12/21/2021
WETLAND AND STREAM IMPACTS
SITE IMPACT ZOOM: 1" = 40'
UTILITIES BY OTHERS
NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.
PROJECT REFERENCE NO. R-5705A
SHEET NO. UE-06A
LEGEND
DENOTES TEMPORARY IMPACTS DUE TO ROADWAY (DETERMINED BY OTHERS)
DENOTES PERMANENT IMPACTS DUE TO ROADWAY (DETERMINED BY OTHERS)
DENOTES HAND CLEARING
PERMIT DRAWING SHEET 5 OF 14
NAD 83/NA 2011
ABANDONED
ABANDONED
REM
REM
REM
N 48° 15' 11.4" W
SITE 1
HC
30'L x 10'W BORE PIT
PROPOSED DUKE ENERGY, CENTURYLINK, & CHARTER/SPECTRUM JOINT USE LINE
PUE
PUE
PUE
15" RCP-IV
Harnett Co Dept Public Utilities, 16", DIP
Harnett Co Dept Public Utilities, 8", PVC
NC 55 25' BST
Century Link, Charter, FO, Spirit Comm
+89.74 107.5' RT
+56.02 113.58' RT
+52.21 106.98' RT
+24.41 106.48' RT
+29.07

Submitted 12/21/2021

PROJECT REFERENCE NO.	SHEET NO.
R-5705A	UE-08

UTILITIES BY OTHERS

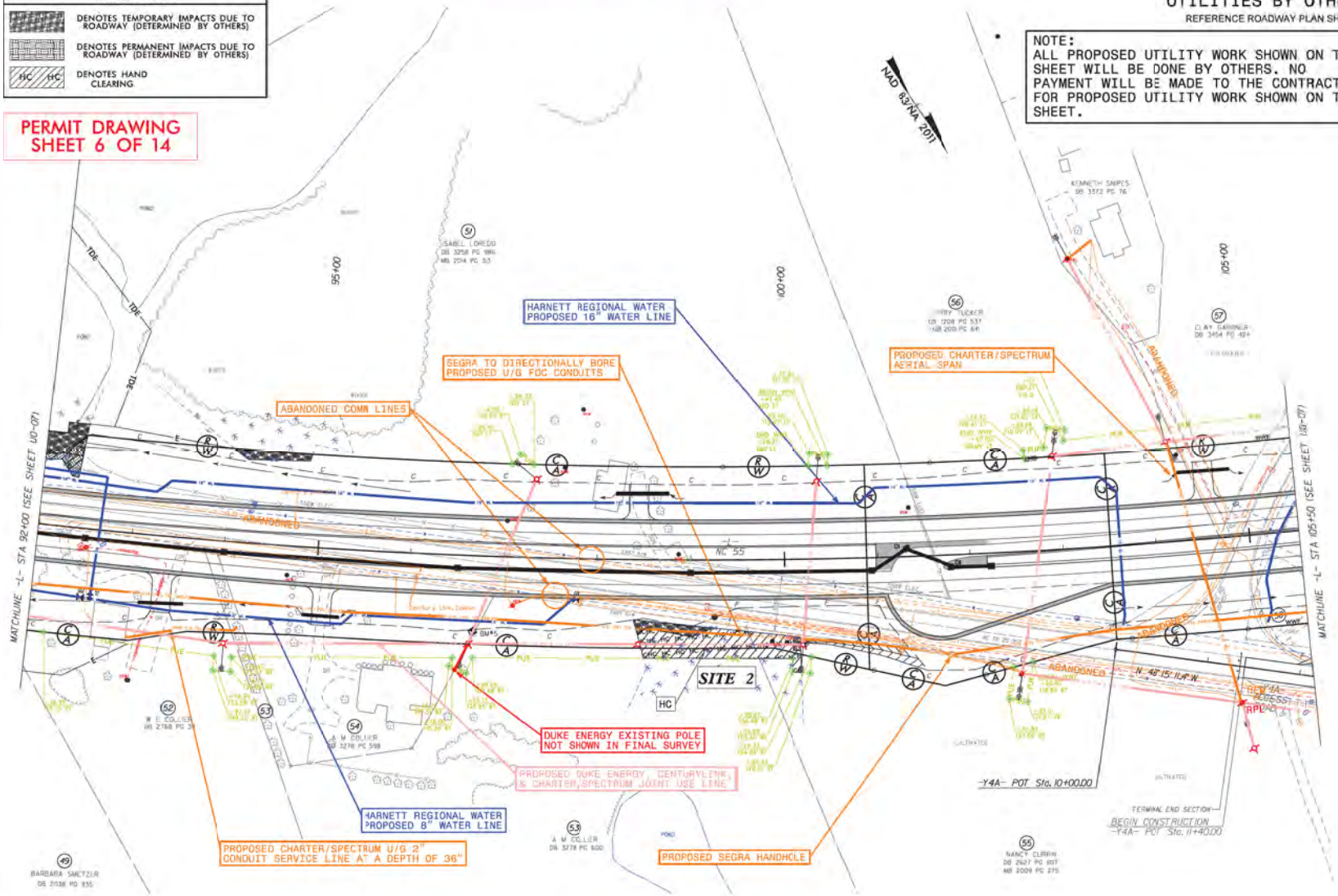
REFERENCE ROADWAY PLAN SHEET 10

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

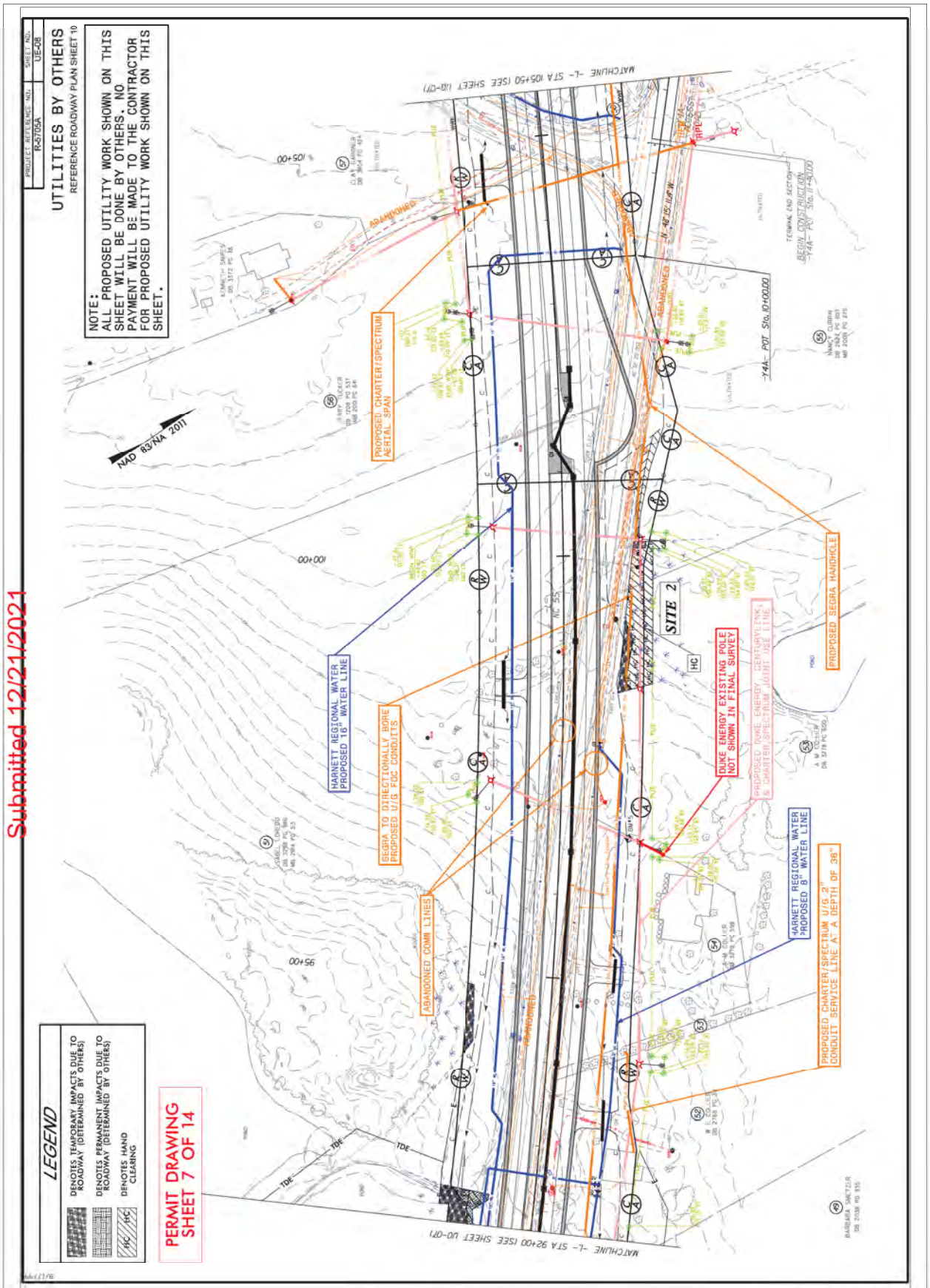
LEGEND

- DENOTES TEMPORARY IMPACTS DUE TO ROADWAY (DETERMINED BY OTHERS)
- DENOTES PERMANENT IMPACTS DUE TO ROADWAY (DETERMINED BY OTHERS)
- HC DENOTES HAND CLEARING

PERMIT DRAWING
SHEET 6 OF 14



P-96

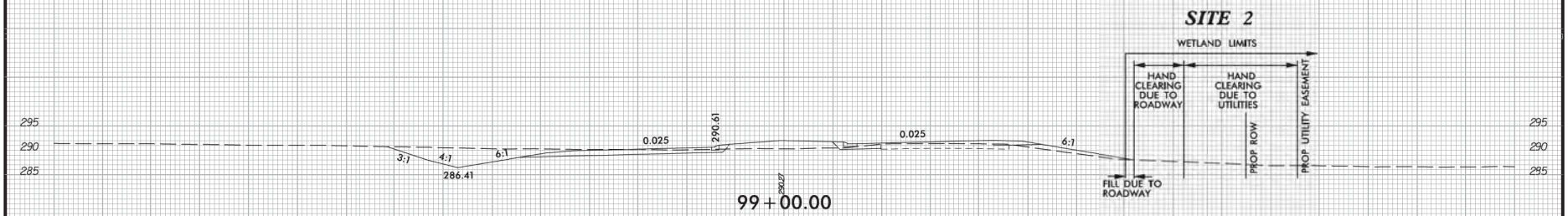


Submitted 12/21/2021

Submitted 12/21/2021

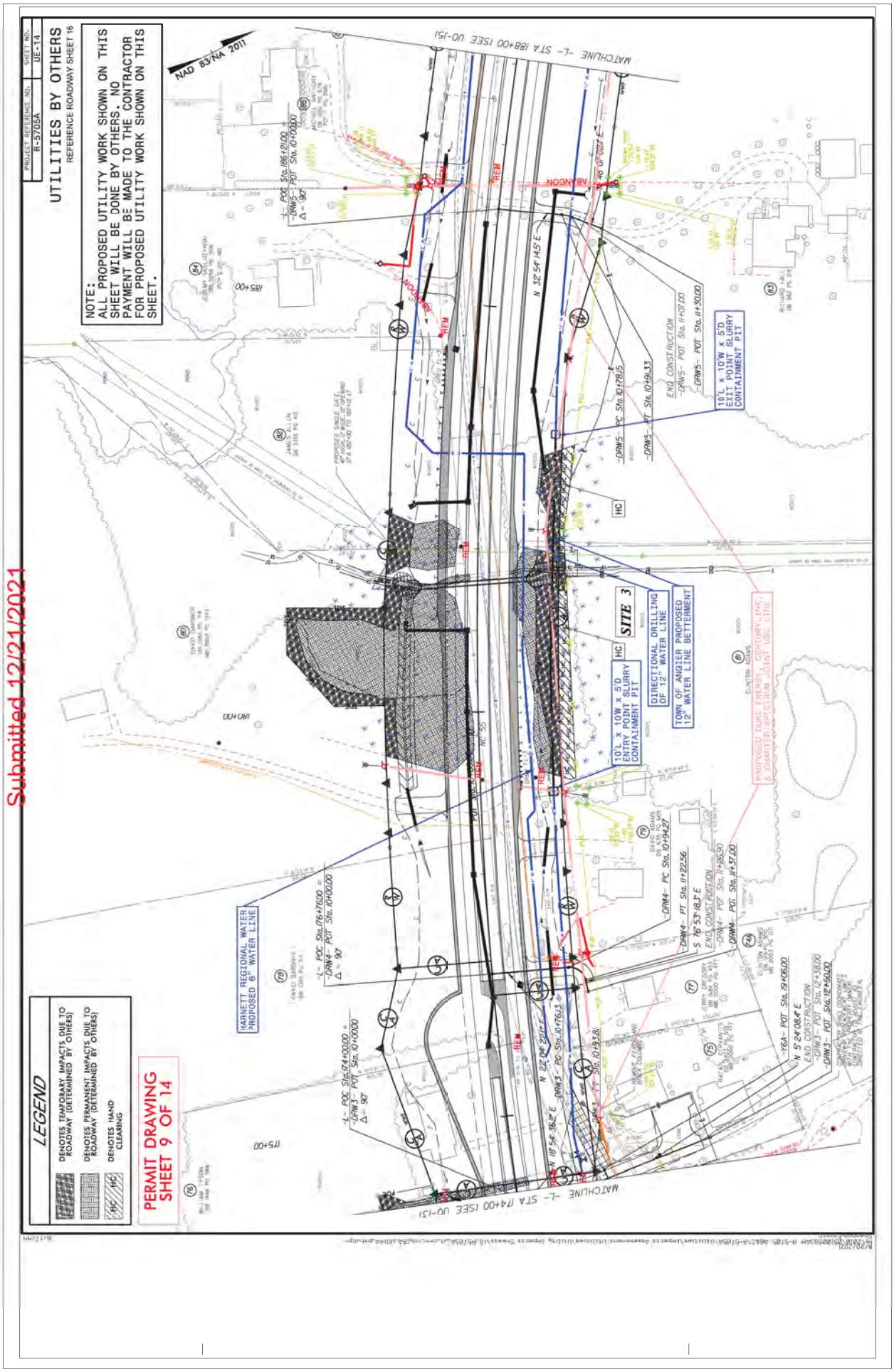
PERMIT DRAWING
SHEET 8 OF 14

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET _ OF _

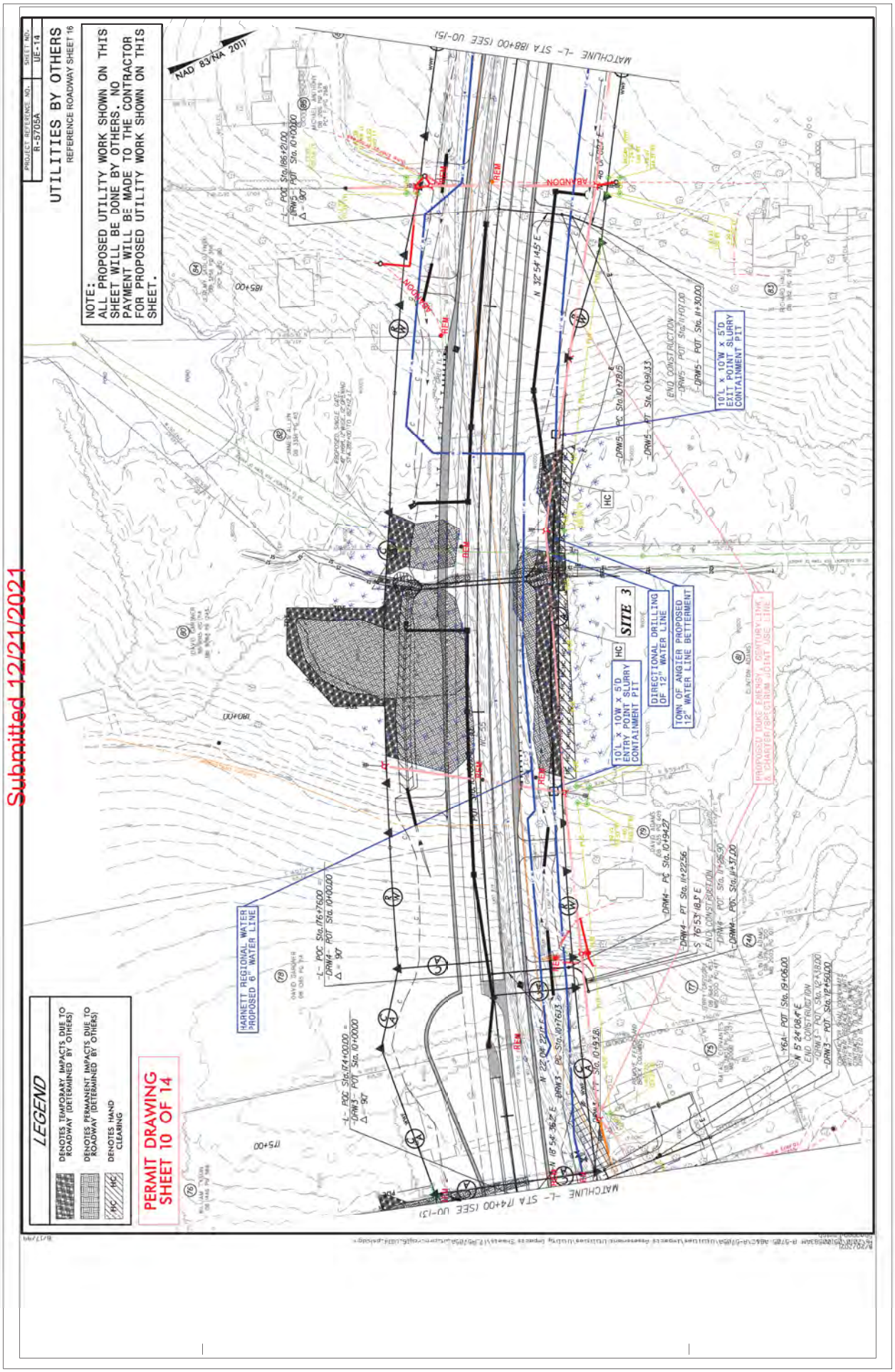


8/20/2020

P-98


Submitted 12/21/2021
PROJECT REFERENCE NO. R-5705A
SHEET NO. UE-14
UTILITIES BY OTHERS
REFERENCE ROADWAY SHEET 16
NAD 83/NA 2011
NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.
LEGEND
DENOTES TEMPORARY IMPACTS DUE TO ROADWAY (DETERMINED BY OTHERS)
DENOTES PERMANENT IMPACTS DUE TO ROADWAY (DETERMINED BY OTHERS)
DENOTES HAND CLEARING
PERMIT DRAWING
SHEET 9 OF 14
MATCHLINE -L- STA 188+00 (SEE UO-15)
MATCHLINE -L- STA 174+00 (SEE UO-15)
HARNETT REGIONAL WATER PROPOSED 6" WATER LINE
10'L x 10'W x 5'D ENTRY POINT SLURRY CONTAINMENT PIT
DIRECTIONAL DRILLING OF 12" WATER LINE
TOWN OF ANGIER PROPOSED 12" WATER LINE BETTERMENT
10'L x 10'W x 5'D EXIT POINT SLURRY CONTAINMENT PIT
SITE 3
PROPOSED DUKE ENERGY, CENTURYLINK & CHARTER/SPECTRUM JOINT USE LINE
ABANDON
REM
END CONSTRUCTION

P-100



Submitted 12/21/2021

Submitted 12/21/2021

PROJECT REFERENCE NO.	SHEET NO.
R-5705A	UE-14A

WETLAND AND STREAM IMPACTS
SITE IMPACT ZOOM: 1" = 40'

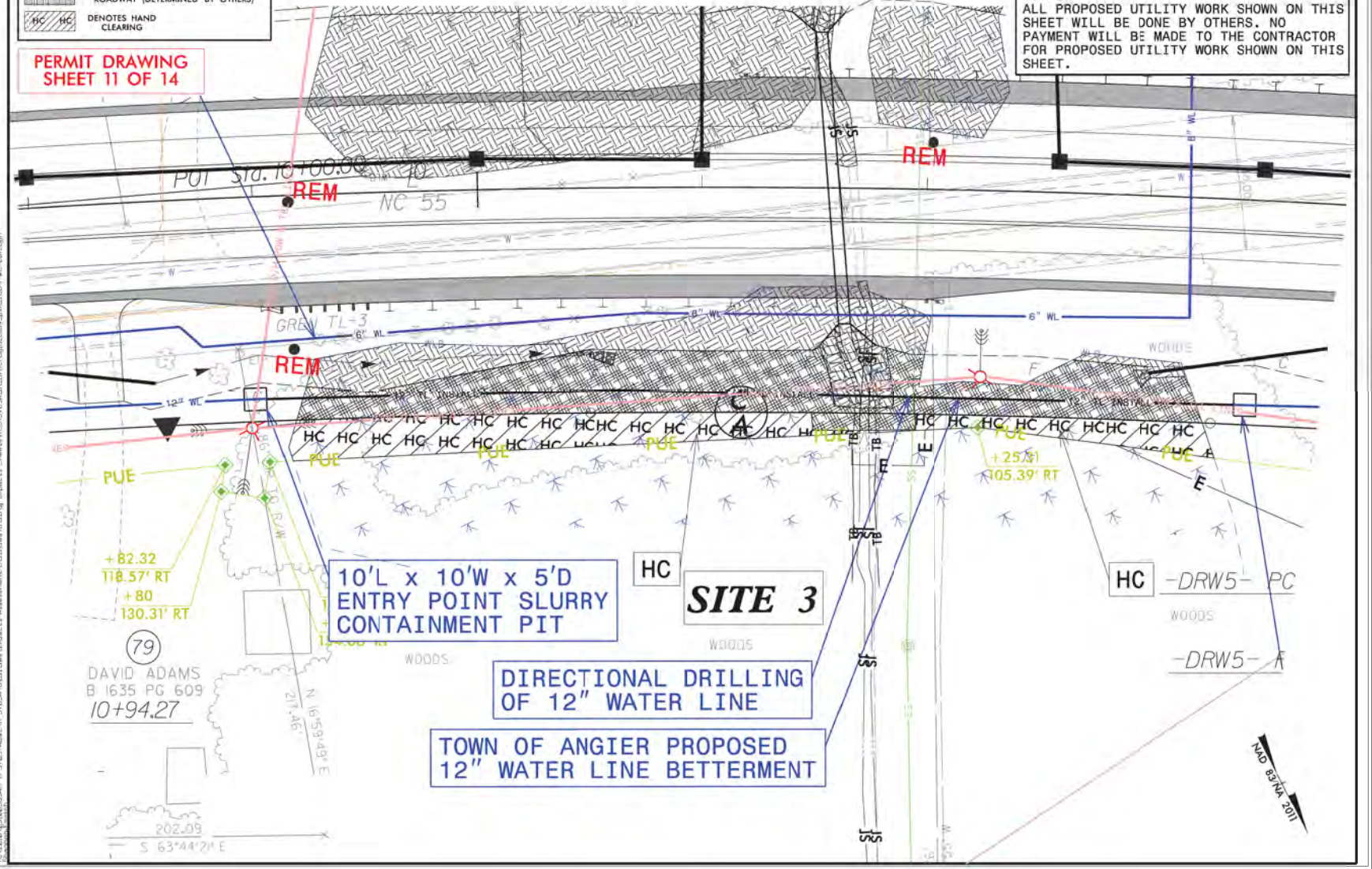
UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

LEGEND

- DENOTES TEMPORARY IMPACTS DUE TO ROADWAY (DETERMINED BY OTHERS)
- DENOTES PERMANENT IMPACTS DUE TO ROADWAY (DETERMINED BY OTHERS)
- HC HC DENOTES HAND CLEARING

PERMIT DRAWING
SHEET 11 OF 14



P-101

Submitted 12/21/2021

WETLAND AND STREAM IMPACTS
SITE IMPACT ZOOM: 1" = 40'

PROJECT REFERENCE NO. R-5705A | SHEET NO. UE-14A

UTILITIES BY OTHERS

NOTE:
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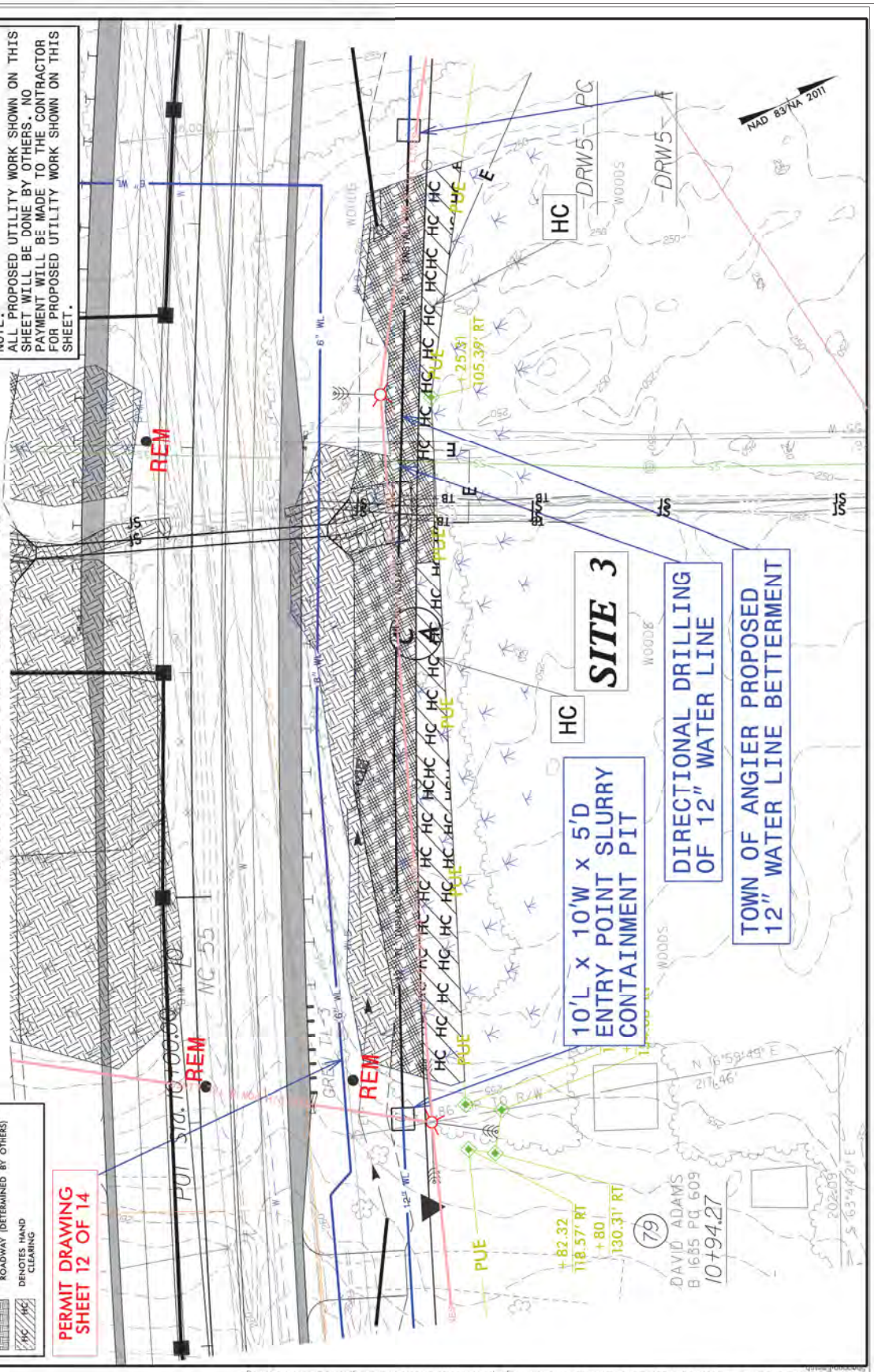
LEGEND
- DENOTES TEMPORARY IMPACTS DUE TO ROADWAY (DETERMINED BY OTHERS)
- DENOTES PERMANENT IMPACTS DUE TO ROADWAY (DETERMINED BY OTHERS)
- HC DENOTES HAND CLEARING

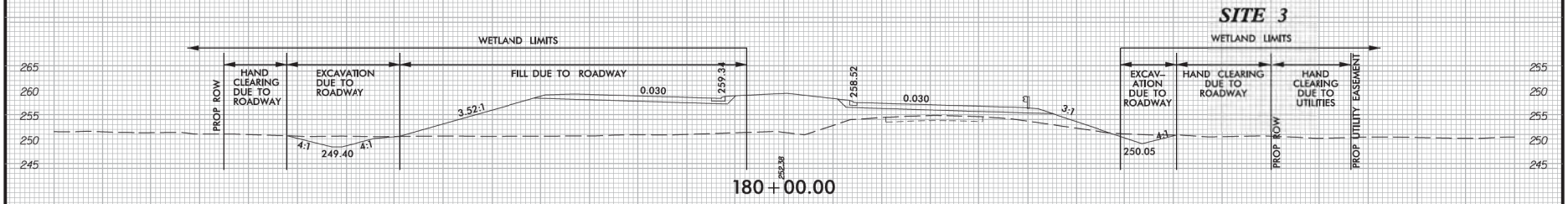
PERMIT DRAWING SHEET 12 OF 14



Submitted 12/21/2021

PERMIT DRAWING
SHEET 13 OF 14

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5705A	PERMIT SHEET _ OF _



8/20/2020

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Submitted 12/21/2021

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L-77+27/77+56 RT	OH Power & Telephone Line					0.01					
2	-L- 98+43/100+17 RT	OH Power & Telephone Line					0.11					
3	-L-179+12/183+33 RT	OH Power & Telephone Line					0.11					
TOTALS*:							0.23			0	0	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
August 2021
Harnett County
R-5705A Utility Permit Plans
46377.1.2
SHEET 14 OF 14

Revised 2018 Feb

P-104

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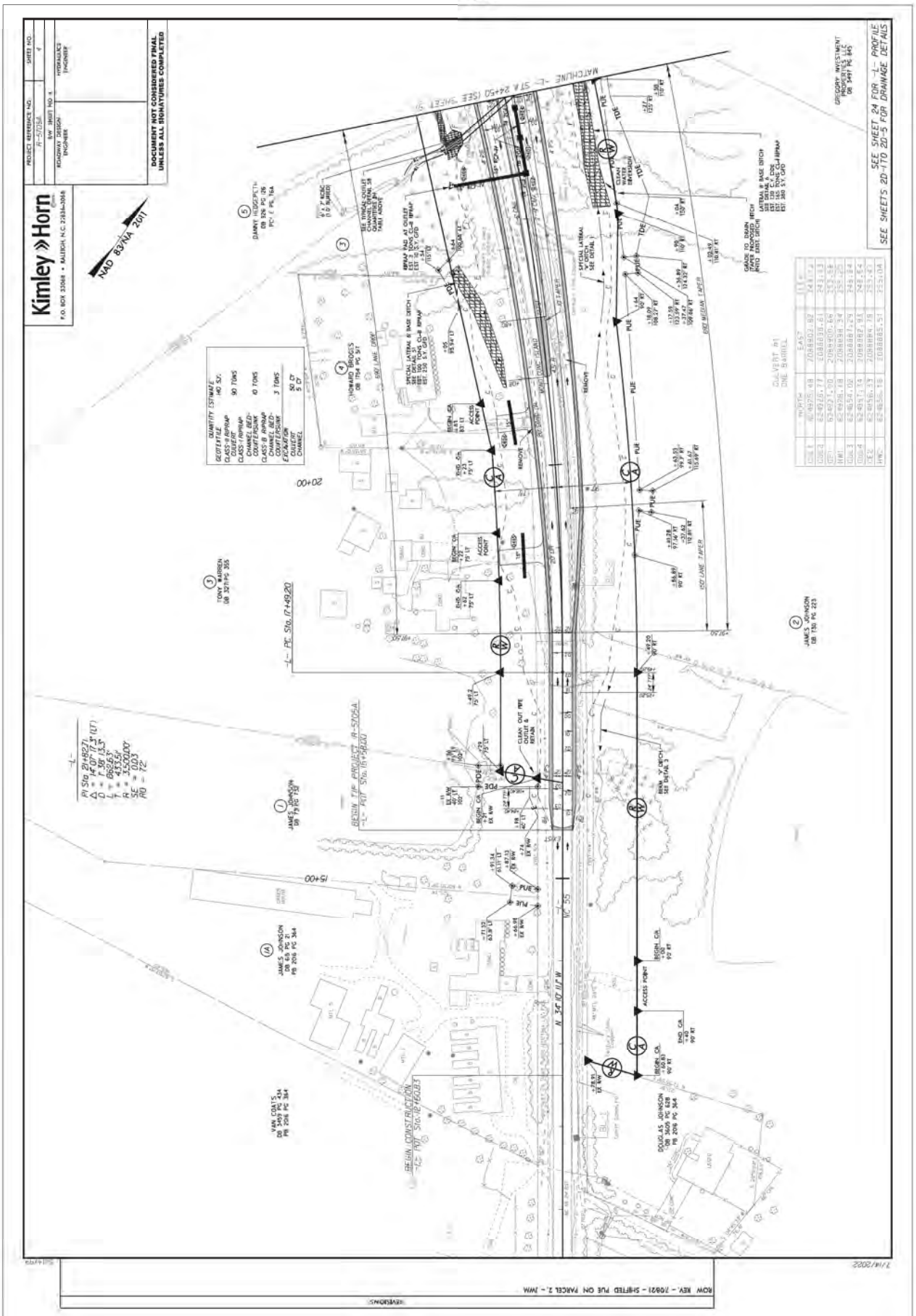
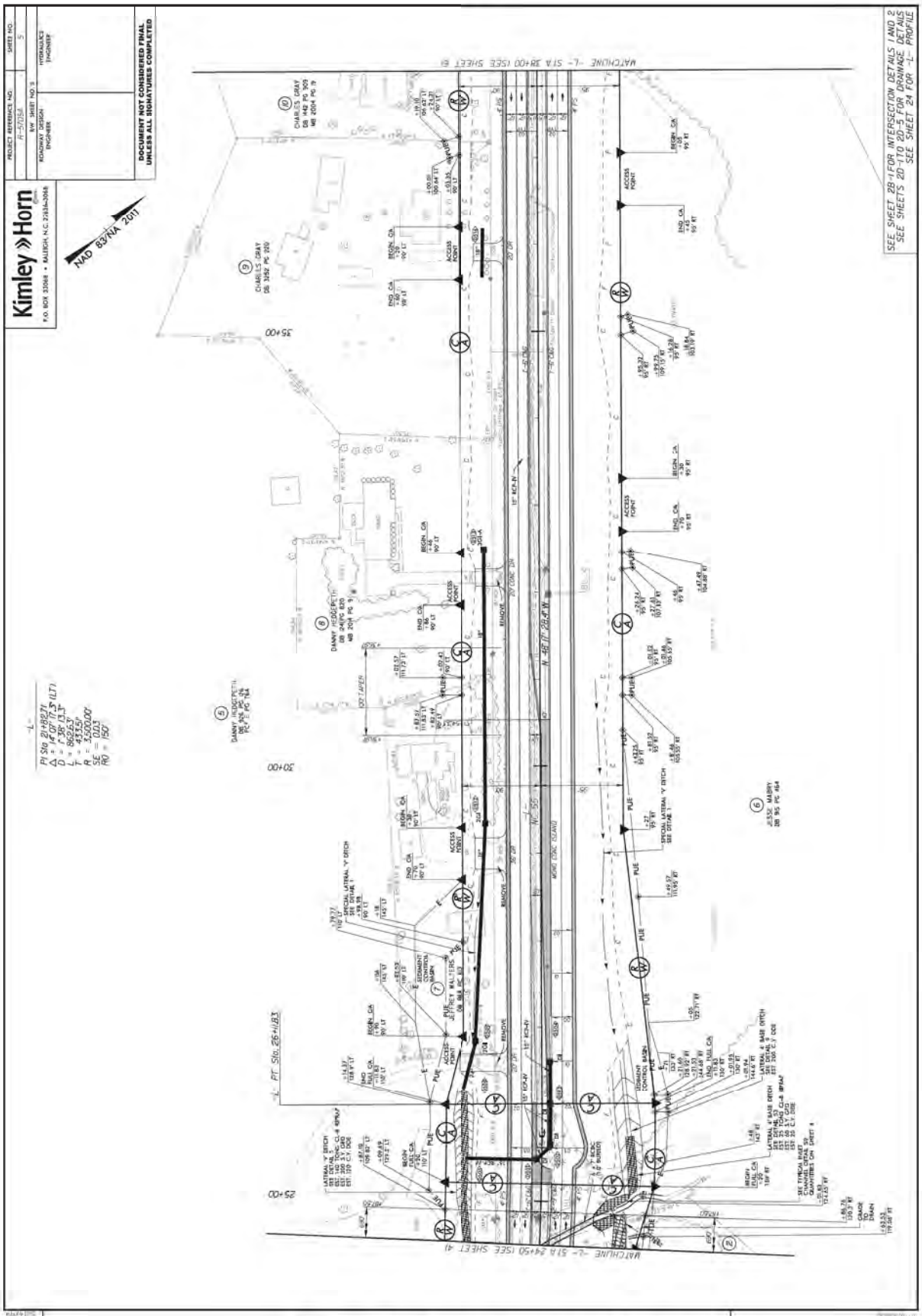

Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
PROJECT REFERENCE NO. R-5705A
SHEET NO. 4
R/W SHEET NO. 4
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
MATCHLINE -L- STA 24+50 (SEE SHEET 5)
SEE SHEET 24 FOR -L- PROFILE
SEE SHEETS 20-1 TO 20-5 FOR DRAINAGE DETAILS
QUANTITY ESTIMATE
GEOTEXTILE 140 S.Y.
CLASS II RIPRAP 50 TONS
CLASS I RIPRAP 10 TONS
CHANNEL BED COUNTERSUNK 3 TONS
EXCAVATION
CHANNEL 50 CY
COUNTERSUNK 5 CY
-L- PC Sta. 17+49.20
BEGIN TIP PROJECT R-5705A
-L- PVT Sta. 15+80.00
BEGIN CONSTRUCTION
-L- PVT Sta. 12+60.83
PI Sta 21+82.71
Δ = 14°07'17.3" (LT)
D = 7°38'13.3"
L = 185.25'
T = 93.15'
R = 750.00'
SE = .003
PD = 72'
N 34°07'17" W
PC 55
CULVERT #1
ONE BARREL
GREGORY INVESTMENT PROPERTIES, LLC
DB 5497 PG 343
JAMES JOHNSON
DB 759 PG 223
TONY WARREN
DB 327 PG 355
JAMES JOHNSON
DB 79 PG 752
JAMES JOHNSON
DB 69 PG 21
PB 206 PG 344
WM CALTS
DB 3419 PG 638
PB 206 PG 344
DOUGLAS JOHNSON
DB 3419 PG 638
PB 206 PG 344
DANNY HUDGETTS
DB 326 PG 126
PC-1 PL 164
CHOWARD BRIGGS
DB 1754 PG 97
ACCESS POINT
BEGIN CA
END CA
REMOVE
PUE
TOE
CLEAN OUT PIPE
CLEAN & REPAIR
SPECIAL LATERAL & BASE DITCH
SEE DETAIL
EST 100 TONS CLASS II RIPRAP
EST 10 S.Y. GEO
EST 230 S.Y. GEO
EST 10 S.Y. GEO
EST 10 TONS CLASS I RIPRAP
EST 3 S.Y. GEO
EST 130 S.Y. GEO
EST 380 S.Y. GEO
GRADE TO DRAIN
PAVE INCREASED WIDTH
PAVE BASE DITCH
LATERAL & BASE DITCH
SEE DETAIL
EST 130 S.Y. GEO
EST 380 S.Y. GEO
EST 10 TONS CLASS I RIPRAP
EST 3 S.Y. GEO
EST 130 S.Y. GEO
EST 380 S.Y. GEO
EROSION CONTROL
SEE DETAIL
EROSION CONTROL
SEE DETAIL
EROSION CONTROL
SEE DETAIL

P-106


Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
PROJECT REFERENCE NO. R-5704
SHEET NO. 5
R/W SHEET NO. 9
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
SEE SHEET 28-1 FOR INTERSECTION DETAILS 1 AND 2
SEE SHEETS 20-1 TO 20-5 FOR DRAINAGE DETAILS
SEE SHEET 24 FOR -L- PROFILE
WATCHLINE -L- STA 38+00 (SEE SHEET 6)
WATCHLINE -L- STA 24+50 (SEE SHEET 4)
-L- PT Sta 26+183
PI Sta 21+82.71
Δ = 14°27' 11.3" (LT)
D = 1°30' 11.3"
L = 862.53'
T = 433.51'
R = 3,500.00'
SE = 0.03
RO = 150'
CHARLES GRAY
DB 1490 PG 309
WB 2004 PG 19
CHARLES GRAY
DB 1490 PG 300
DANNY HEDGEPETH
DB 2470 PG 820
WB 2004 PG 5
DANNY HEDGEPETH
DB 2470 PG 820
PC = 5% PG 164
PC = PG 164
JESSIE MARRY
DB 95 PG 464
JEFFREY WALTERS
DB 1863 PG 803
N 46°17' 28.4" W
NC 55
MEDIAN DISC ISLAND
RENOVE
ACCESS POINT
BEGIN CA
END CA
SPECIAL LATERAL V DITCH
EST 1,000 L.F. DGE
EST 300 L.F. DGE
EST 1,000 L.F. DGE
EST 300 L.F. DGE
LATERAL & BASE DITCH
EST 25 TONS CL-B RIPRAP
EST 25 L.F. DGE
EST 25 C.Y. DGE
SEE DITCH BOTTOM CHANNEL DETAIL 52 CHANGES ON SHEET 8
GRADE
TOLN
TOLN
REVISIONS
ROW REV. - 5/14/21 - ADDED EASEMENT LABEL ON PARCEL 6. - JWM
ROW REV - 1/20/21 - ADDED PLE AND SHIFTED ACCESS POINT ON PARCEL 6. - JWM
ROW REV - 01/12/22 - REVISED PLE ON PARCELS 6, 9, 10, 13, 14, AND 15 REMOVED PLE ON PARCELS 10 AND 13 - JWM.

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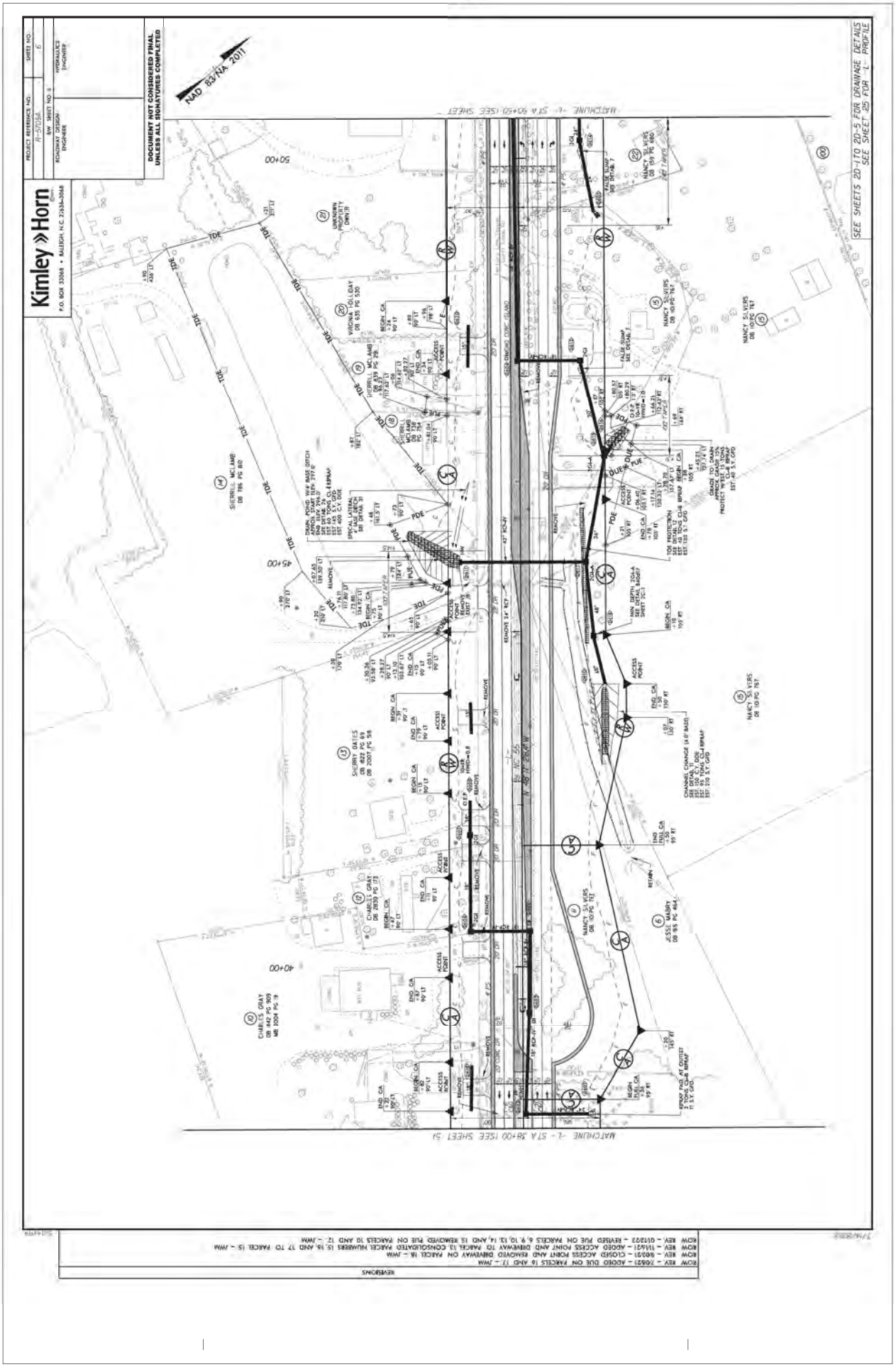
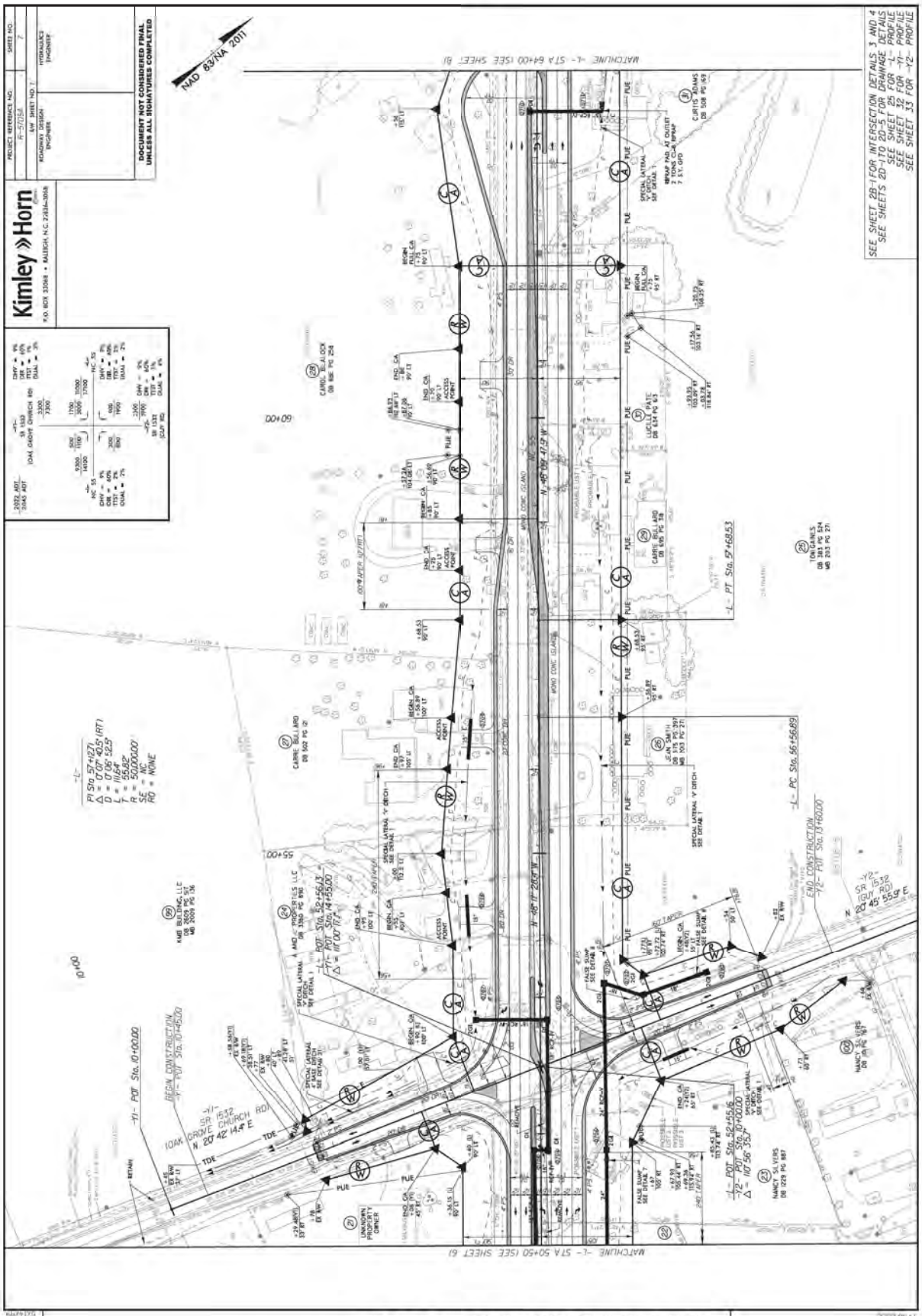
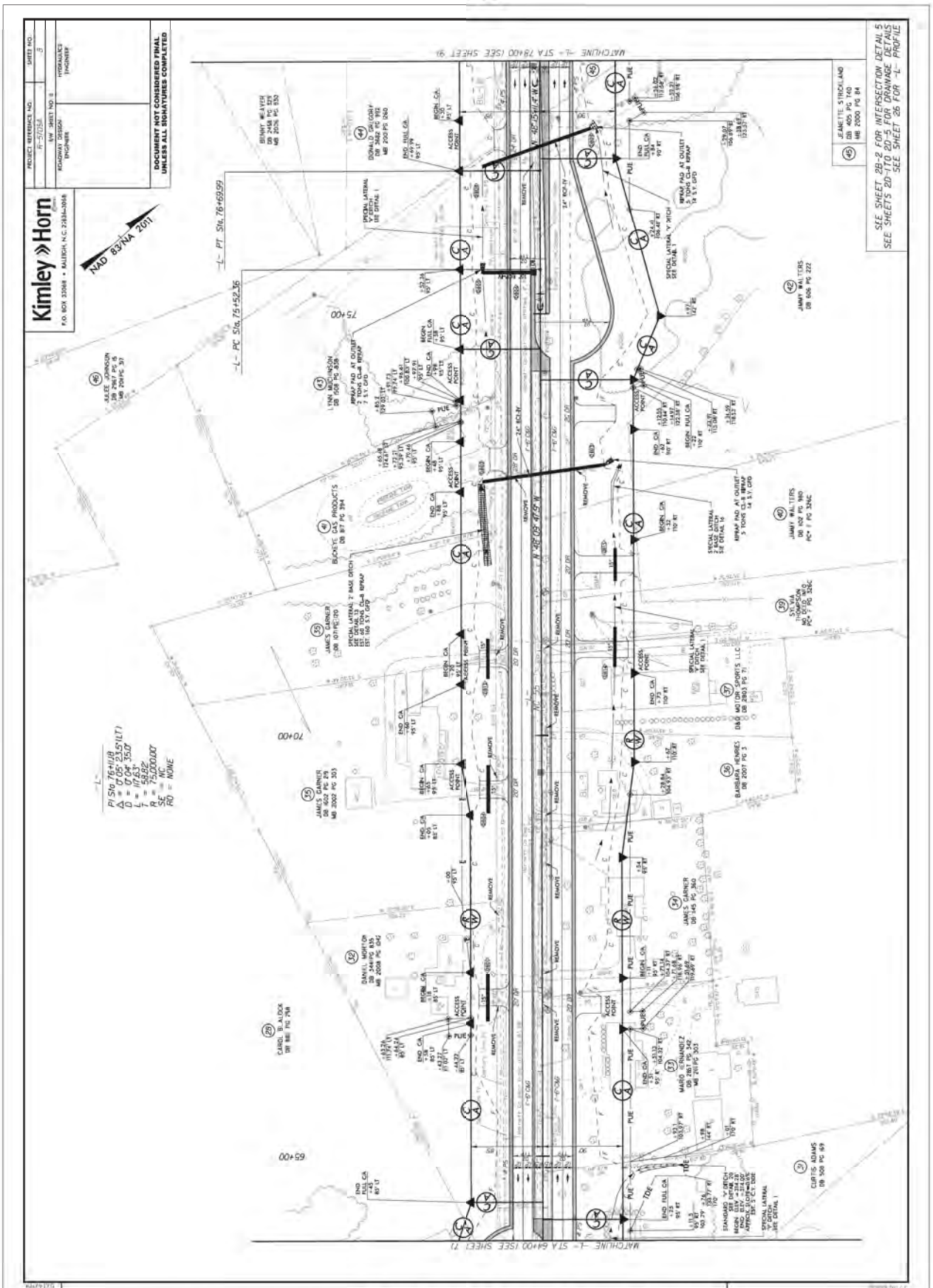


Kimley»Horn
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
SEE SHEETS 2D-1 TO 2D-5 FOR DRAINAGE DETAILS
SEE SHEET 25 FOR -L- PROFILE
MATCHLINE -L- STA 50+50 (SEE SHEET
MATCHLINE -L- STA 38+00 (SEE SHEET 5)
REVISIONS

P-108

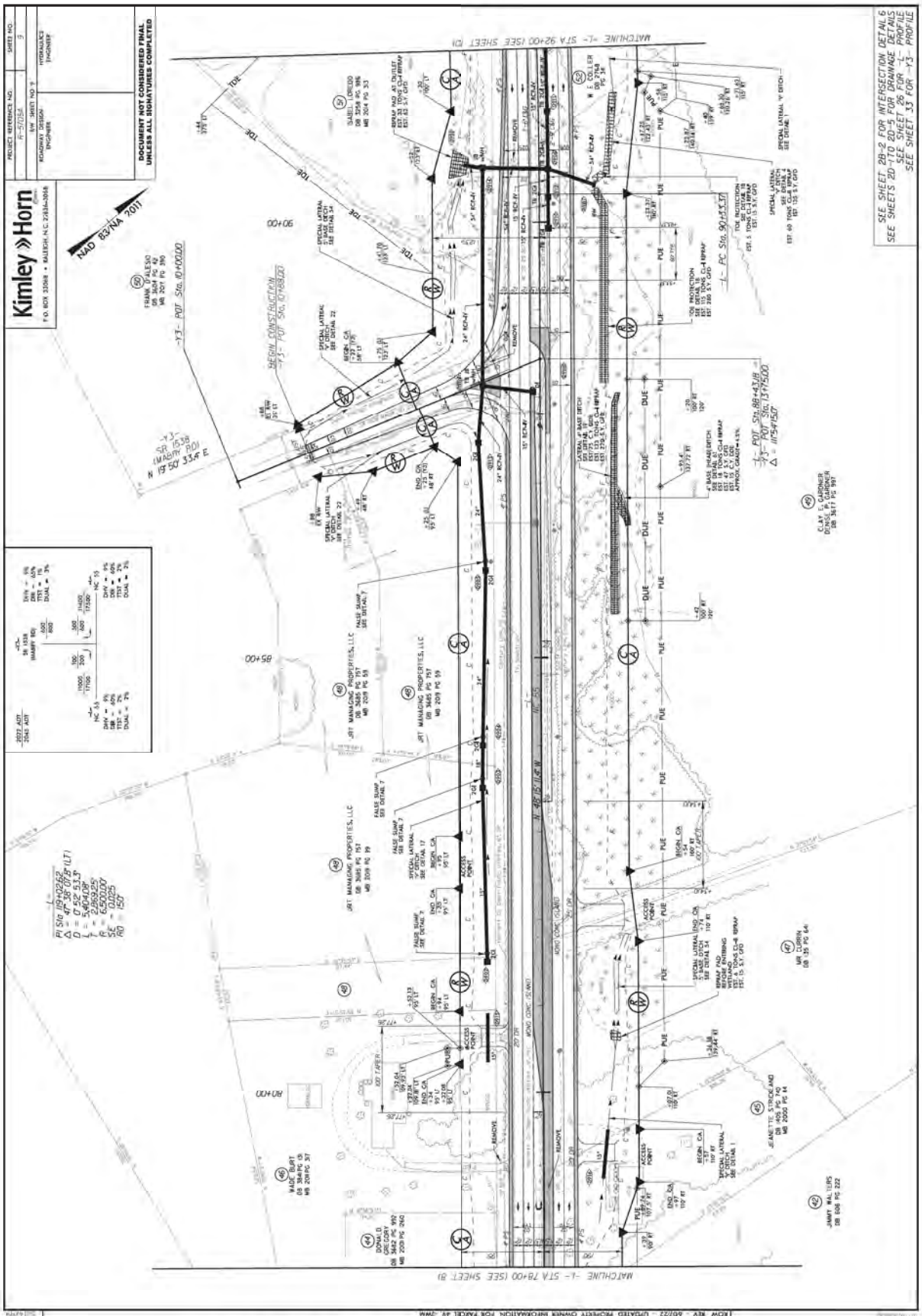

Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
PROJECT REFERENCE NO.
R-5038
SHEET NO.
7
R/W SHEET NO.
7
ROADWAY DESIGN ENGINEER
HYDRAULIC ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
SEE SHEET 28-1 FOR INTERSECTION DETAILS 3 AND 4
SEE SHEETS 20-1 TO 20-5 FOR DRAINAGE DETAILS
SEE SHEET 25 FOR -L- PROFILE
SEE SHEET 32 FOR -Y1- PROFILE
SEE SHEET 33 FOR -Y2- PROFILE
MATCHLINE -L- STA 64+00 (SEE SHEET 6)
MATCHLINE -L- STA 50+50 (SEE SHEET 6)
-L-
PI Sta 57+27.1 (RT)
Δ = 07° 07' 40.5" (RT)
D = 07° 06' 52.5"
L = 166.4'
T = 83.3'
R = 50.0000'
SE = NC
RD = NONE
-L- PT Sta. 57+68.53
-L- PC Sta. 56+56.89
-Y1- POT Sta. 10+00.00
BEGIN CONSTRUCTION
-Y1- POT Sta. 10+45.00
-Y1- POT Sta. 52+55.46
Δ = 110° 00' 11.4"
-Y2- POT Sta. 10+00.00
Δ = 110° 56' 35.4"
-Y2- POT Sta. 13+60.00
END CONSTRUCTION
-Y2- POT Sta. 13+60.00
SR 1532
OAK GROVE CHURCH RD
N 20° 42' 14.4" E
SR 1532
(GUY RD)
N 20° 45' 55.9" E
CARRIE BULLARD
DB 502 PG 12
CAROL B. ALDOX
DB 1656 PG 254
LUCILLE PATE
DB 634 PG 63
CARRIE BULLARD
DB 605 PG 38
TOM GAINES
DB 1836 PG 254
MB 203 PG 271
JEAN SMITH
DB 1175 PG 297
MB 103 PG 271
NANCY SL VIRS
DB 1729 PG 887
MB 2009 PG 36
PUE
TDE
BETAIN
BEGIN CONC. GUTTER
END CONC. GUTTER
SPECIAL LATERAL 4' BASE DITCH
SPECIAL LATERAL 'V' DITCH
FALSE SUMP
REPAIR PAD AT OUTLET
SEE SHEET 2B-1 AND 2B-2 FOR ADDITIONAL DETAILS AND DIMENSIONS
REVISIONS
ROW REV - 6/7/21 - SHIFTED ACCESS POINT AND DRIVEWAY ON PARCEL 28 ADDED ACCESS POINT NO DRIVEWAY AT STA 60+30 - JWM
ROW REV - 1/19/21 - ADDED DRIVEWAY TO PARCEL 23 REMOVED PIPE ON PARCELS 24 AND 28 - JWM
ROW REV - 3/09/21 - ADDED PIPE ON PARCELS 24 AND 28 REVISED PIPE TO TDE ON PARCEL 99 - JWM
ROW REV - 3/09/21 - REVISED TDE BACK TO PIPE ON PARCEL 99 - JWM

P-109

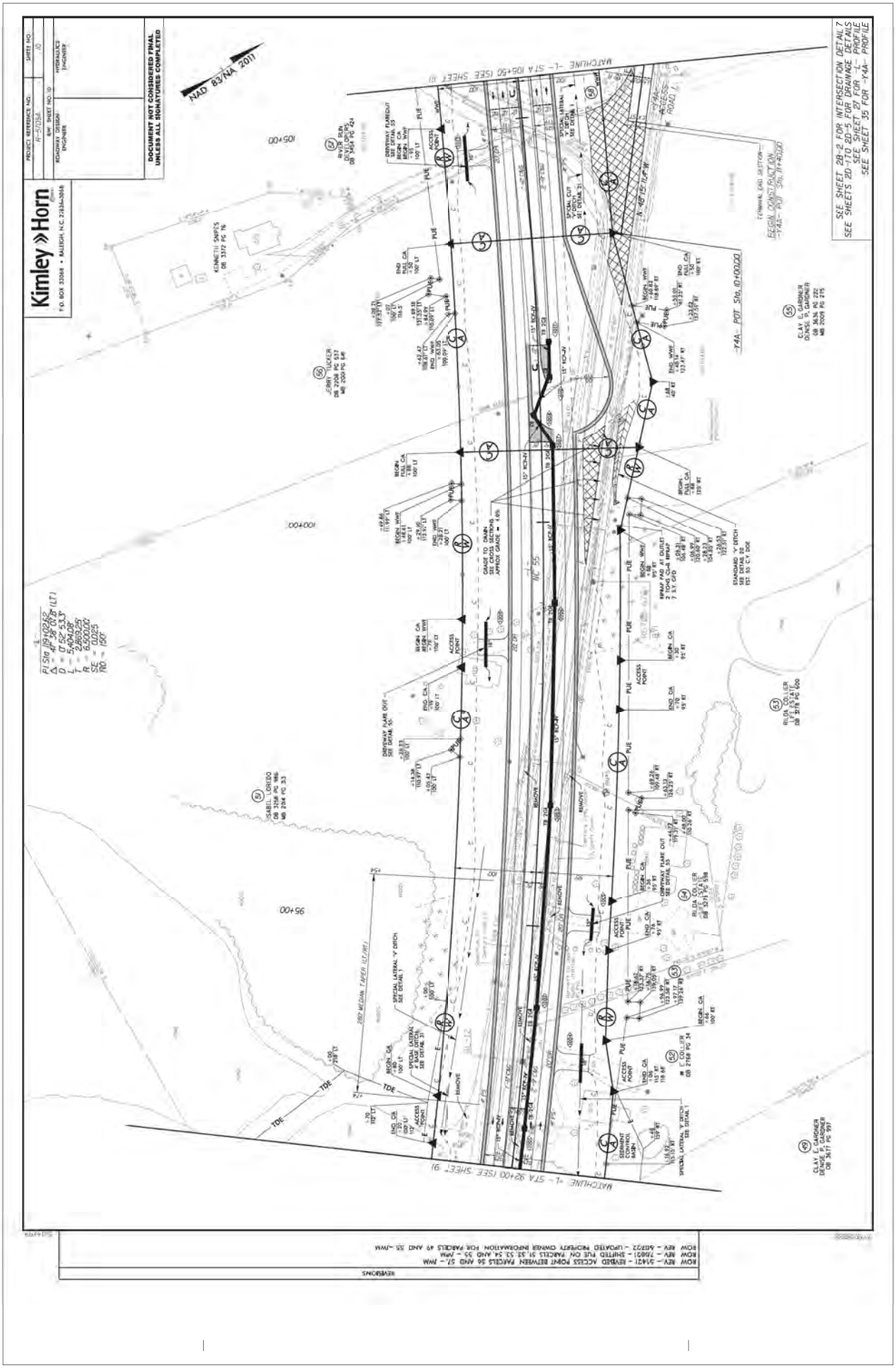


Kimley»Horn
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
SEE SHEET 2B-2 FOR INTERSECTION DETAIL 5
SEE SHEETS 2D-1 TO 2D-5 FOR DRAINAGE DETAILS
SEE SHEET 2B FOR -L- PROFILE
MATCHLINE -L- STA 64+00 (SEE SHEET 7)
MATCHLINE -L- STA 78+00 (SEE SHEET 9)
-L- PT Sta. 76+69.99
-L- PC Sta. 75+52.36
75+00
70+00
65+00

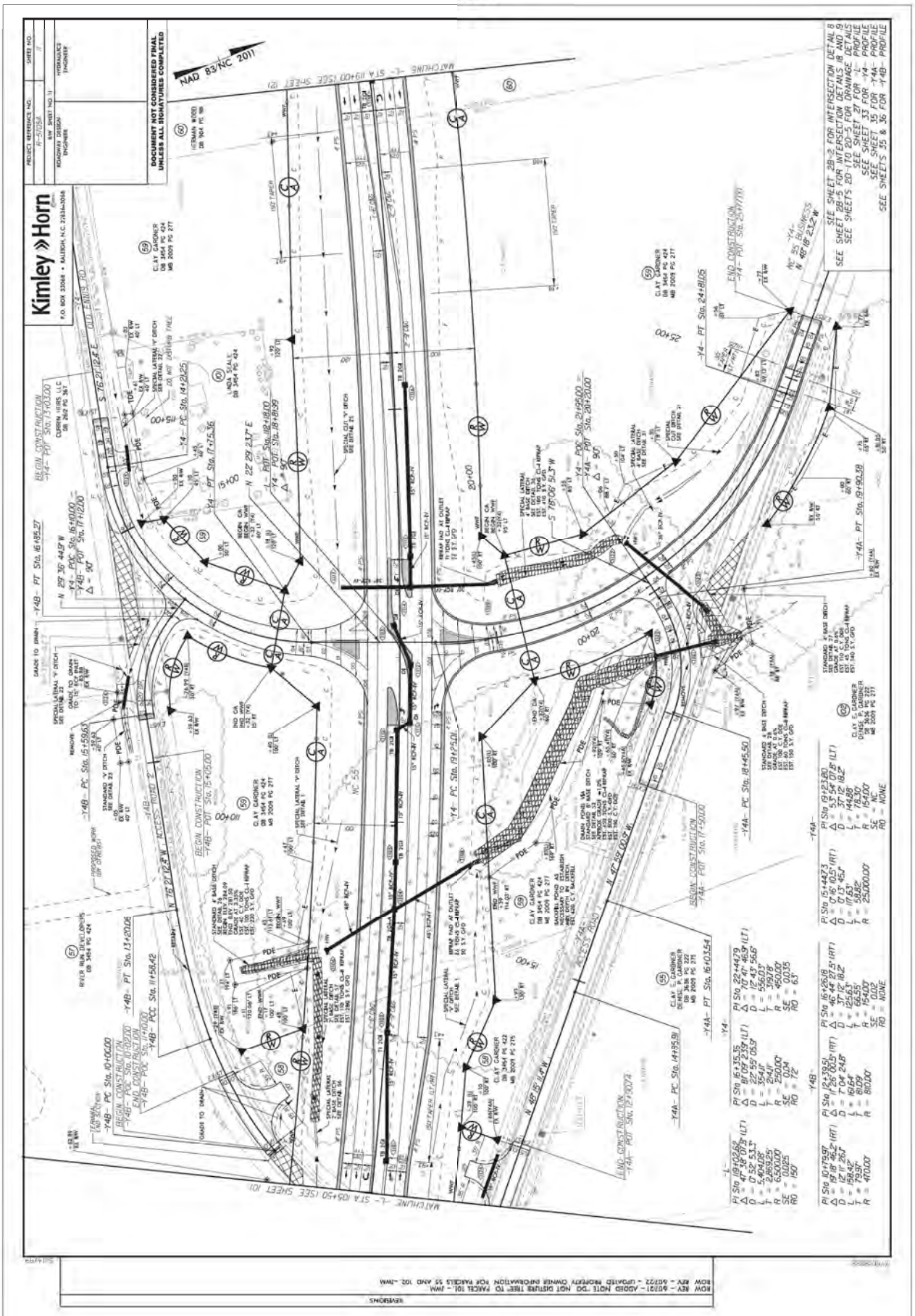
P-110


Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
NAD 83/NA 2011
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
SEE SHEET 28-2 FOR INTERSECTION DETAILS
SEE SHEETS 20-1TO 20-5 FOR DRAINAGE DETAILS
SEE SHEET 26 FOR -L- PROFILE
SEE SHEET 33 FOR -Y3- PROFILE
MATCHLINE -L- STA 92+00 (SEE SHEET 10)
MATCHLINE -L- STA 78+00 (SEE SHEET 8)
-Y3- POT Sta. 10+00.00
-Y3- POT Sta. 10+08.00
BEGIN CONSTRUCTION
-Y3- POT Sta. 10+08.00
SR 1538 (MABRY RD)
N 19° 50' 33.4" E
-L- PC Sta. 90+55.37
-L- POT Sta. 88+43.18
-Y3- POT Sta. 13+75.00
Δ = 11°54'50"
PI Sta 119+02.62
Δ = 47° 38' 07.8" (LT)
D = 0° 52' 53.3"
L = 5,404.08'
T = 2,589.25'
R = 6,500.00'
SE = 0.025
RD = 150'
90+00
85+00
80+00
NC 33
NC 33
JRT MANAGING PROPERTIES, LLC
DB 3685 PG 157
MB 2009 PG 99
FALSE SUMP SEE DETAIL 7
SPECIAL LATERAL 4' BASE DITCH SEE DETAIL 17
BEGIN CA
END CA
ACCESS POINT
REMOVE
SPECIAL LATERAL 4' BASE DITCH SEE DETAIL 34
SPECIAL LATERAL 4' BASE DITCH SEE DETAIL 22
SPECIAL LATERAL V DITCH SEE DETAIL 22
SPECIAL LATERAL V DITCH SEE DETAIL 1
SPECIAL LATERAL 4' BASE DITCH SEE DETAIL 1
SPECIAL LATERAL 4' BASE DITCH SEE DETAIL 2
SPECIAL LATERAL 4' BASE DITCH SEE DETAIL 3
SPECIAL LATERAL 4' BASE DITCH SEE DETAIL 4
SPECIAL LATERAL 4' BASE DITCH SEE DETAIL 5
SPECIAL LATERAL 4' BASE DITCH SEE DETAIL

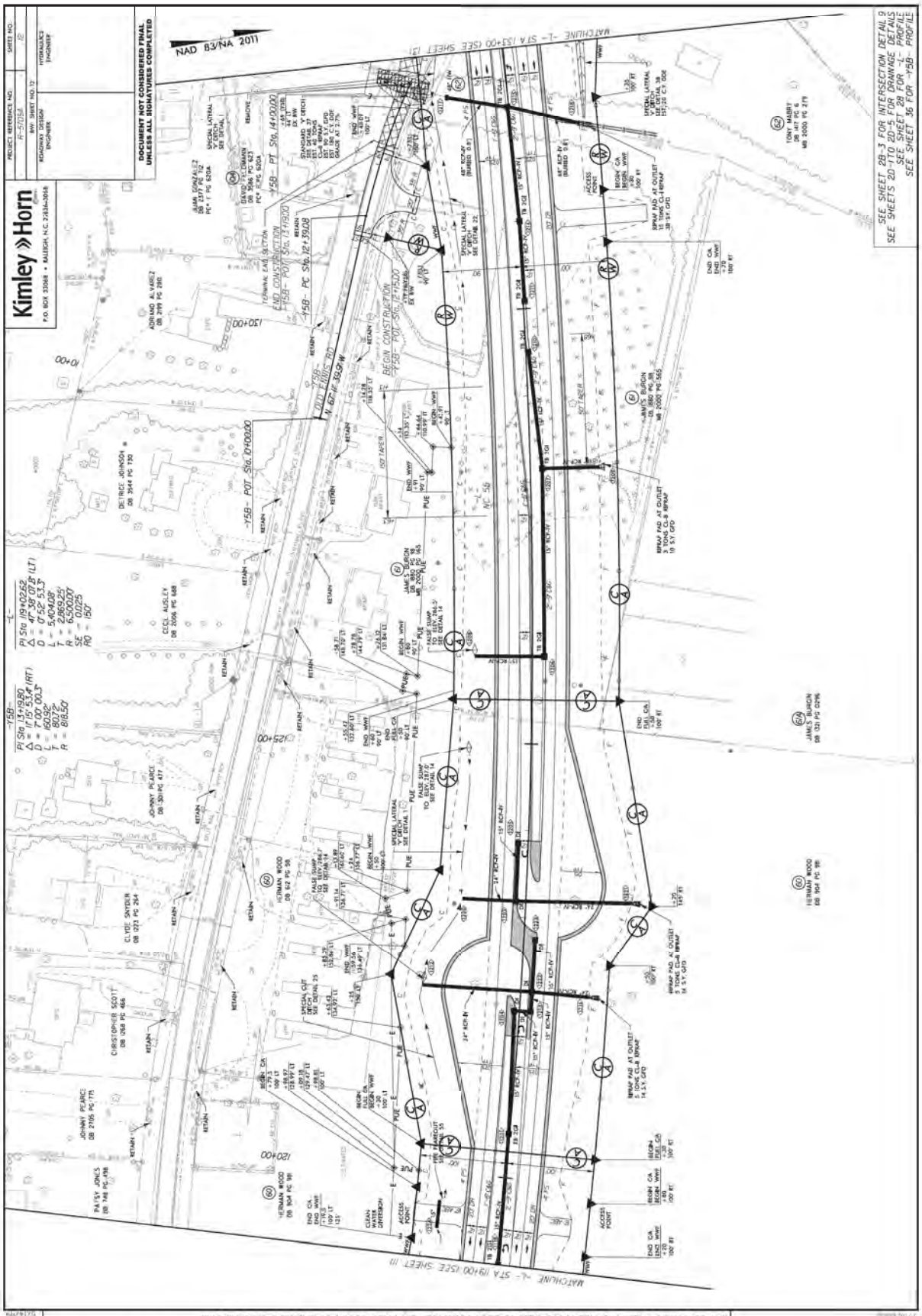
P-111


Kimley»Horn
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
SEE SHEET 2B-2 FOR INTERSECTION DETAIL 7
SEE SHEETS 2D-1 TO 2D-5 FOR DRAINAGE DETAILS
SEE SHEET 27 FOR -L- PROFILE
SEE SHEET 35 FOR -Y4A- PROFILE
MATCHLINE -L- STA 105+50 (SEE SHEET 8)
MATCHLINE -L- STA 92+00 (SEE SHEET 9)
105+00
100+00
95+00
-Y4A- POT Sta. 10+00.00
REVISIONS

P-112


Kimley»Horn
NAD 83/NC 2011
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
BEGIN CONSTRUCTION
END CONSTRUCTION
WATCHLINE -L- STA 105+50 (SEE SHEET 10)
WATCHLINE -L- STA 119+00 (SEE SHEET 12)
REVISIONS
ROW REV - 6/21/22 - UPDATED PROPERTY OWNER INFORMATION FOR PARCELS 55 AND 102 - JWM
ROW REV - 6/21/21 - ADDED NOTE "DO NOT DISTURB TREE" TO PARCEL 101 - JWM

P-113



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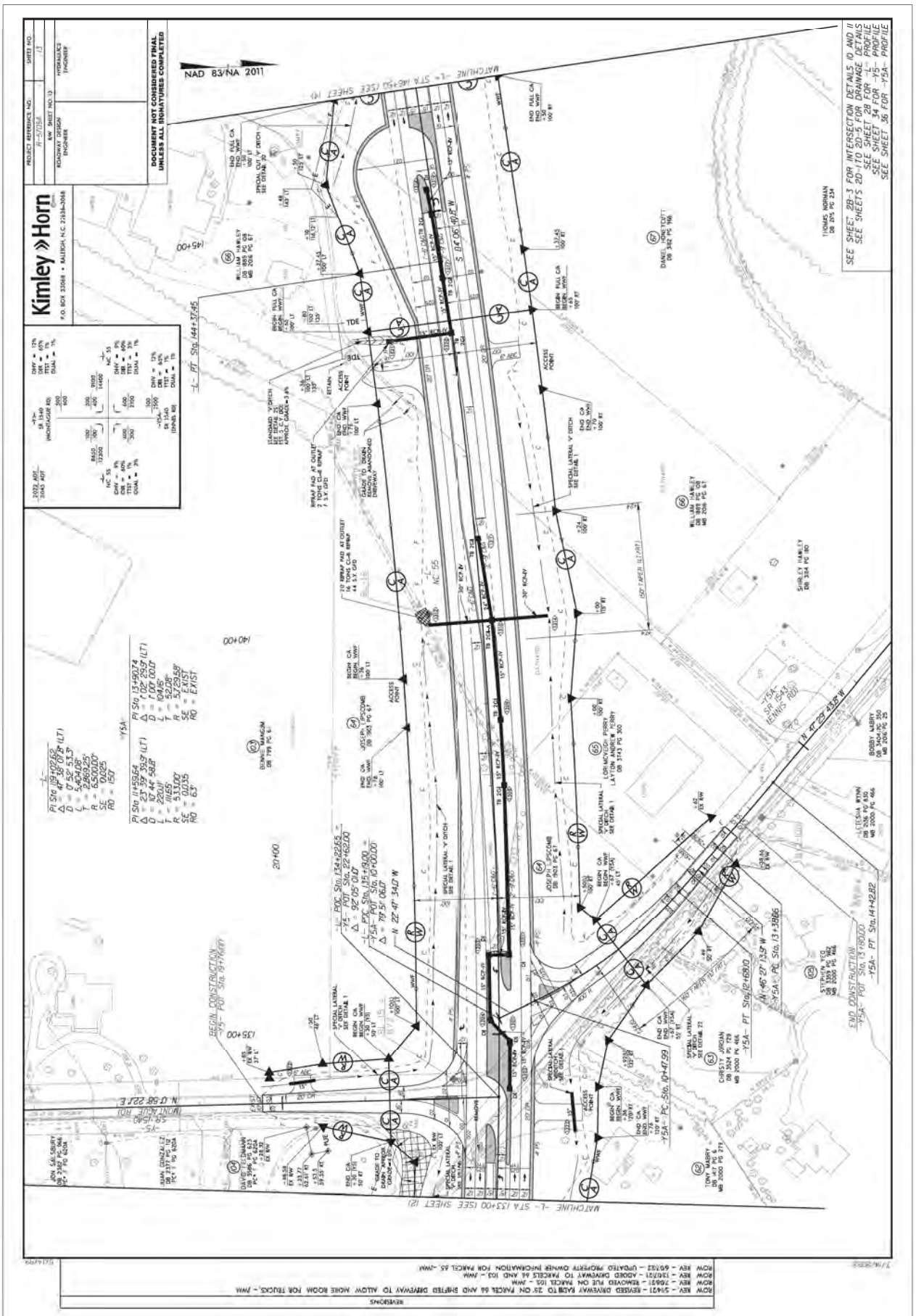
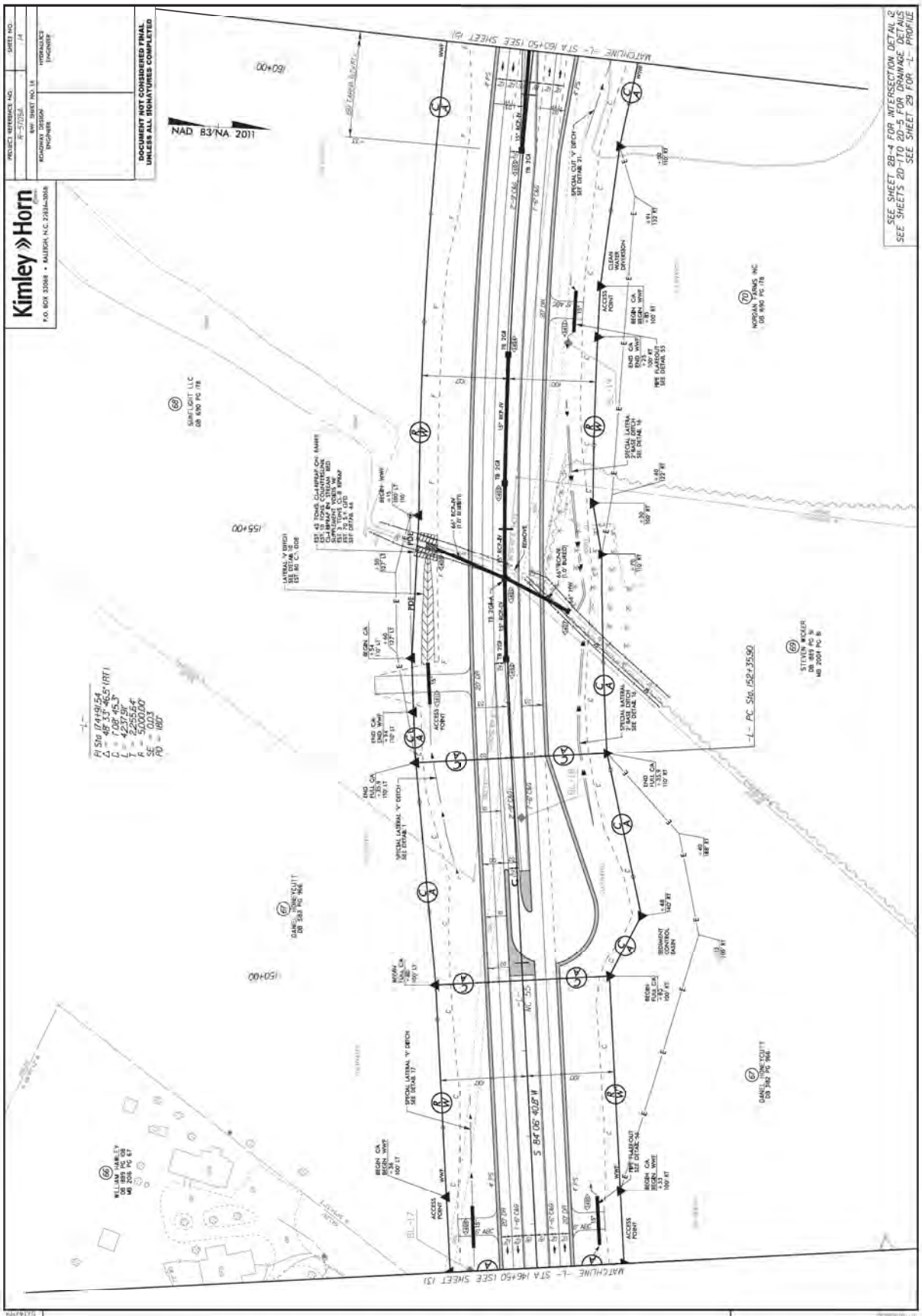
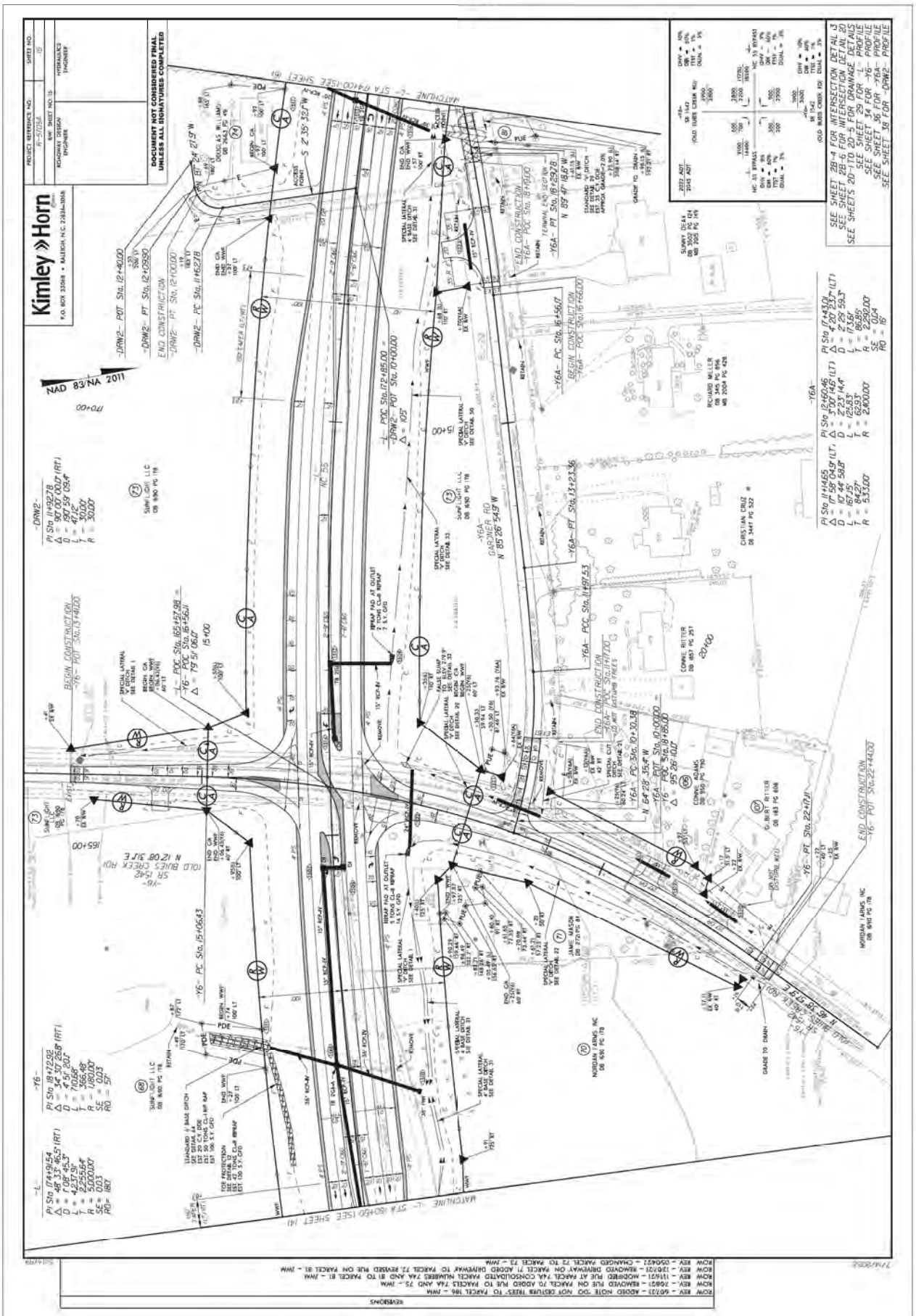
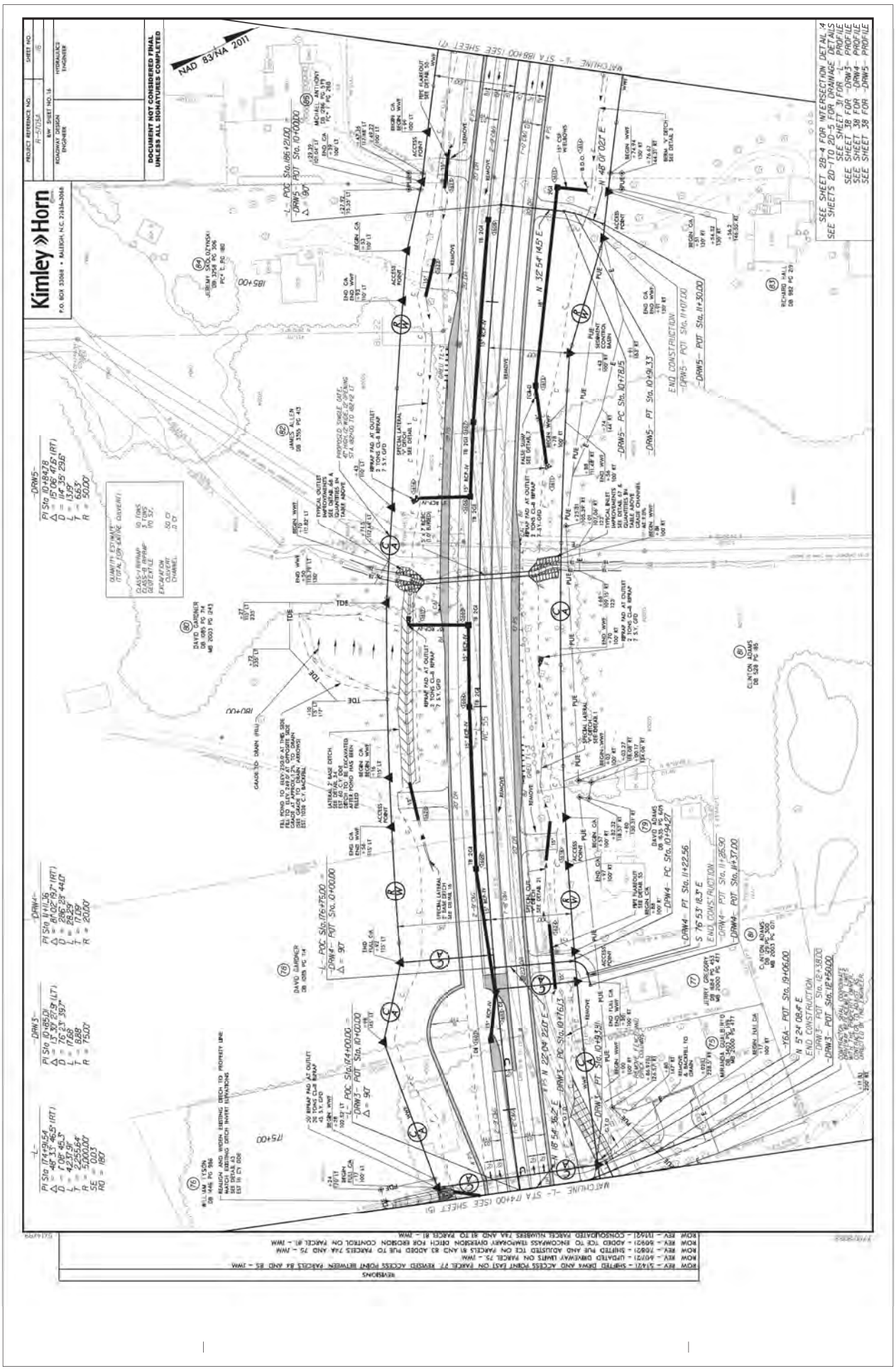
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
SEE SHEET 2B-3 FOR INTERSECTION DETAIL 9
SEE SHEETS 2D-1 TO 2D-5 FOR DRAINAGE DETAILS
SEE SHEET 28 FOR -L- PROFILE
SEE SHEET 36 FOR -Y5B- PROFILE
MATCHLINE -L- STA 133+00 (SEE SHEET 13)
MATCHLINE -L- STA 119+00 (SEE SHEET 11)
REVISIONS

P-114

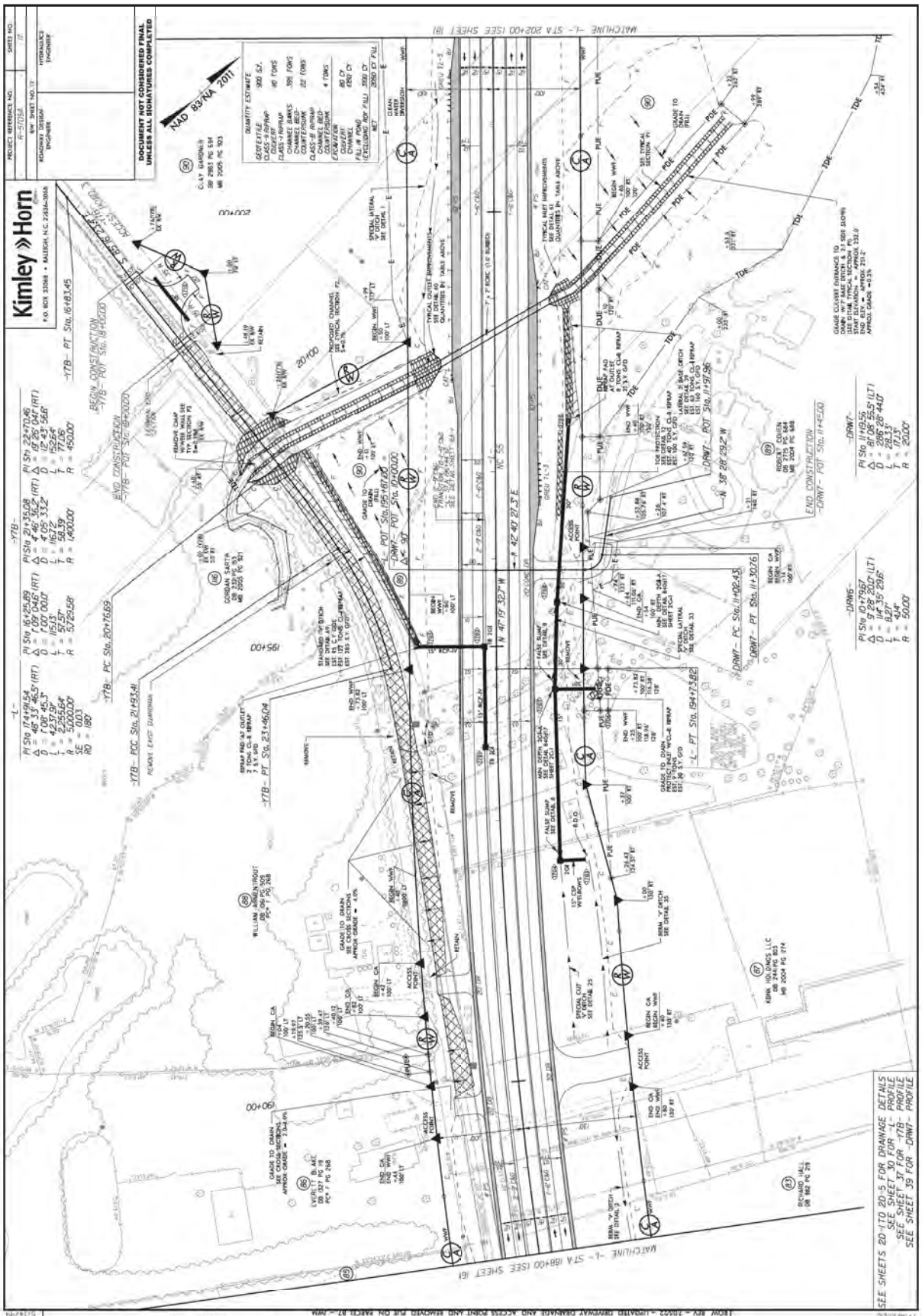

NAD 83/NA 2011
Kimley»Horn
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
SEE SHEET 28-3 FOR INTERSECTION DETAILS 1D AND 1I
SEE SHEETS 2D-1 TO 2D-5 FOR DRAINAGE DETAILS
SEE SHEET 28 FOR -L- PROFILE
SEE SHEET 34 FOR -Y5- PROFILE
SEE SHEET 36 FOR -Y5A- PROFILE
MATCHLINE -L- STA 145+00 (SEE SHEET 1K)
MATCHLINE -L- STA 133+00 (SEE SHEET 1J)
-L- PT Sta 144+37.45
BEGIN CONSTRUCTION -Y5- POT Sta 0+00.00
END CONSTRUCTION -Y5A- POT Sta 13+60.00
-L- POC Sta 134+22.55 = -Y5- POT Sta 22+62.00
Δ = 32° 05' 00.0"
-L- POC Sta 135+19.00 = -Y5A- POT Sta 10+00.00
Δ = 79° 51' 00.0"
N 22° 41' 34.0" W
N 47° 22' 33.5" W
N 46° 27' 13.5" W
-Y5A- PT Sta 12+69.10
-Y5A- PC Sta 10+47.99
-Y5A- PT Sta 141+02.82
-Y5A- PC Sta 13+38.66
PI Sta 11+49.64
Δ = 23° 39' 39.9" (LT)
D = 10° 44' 58.8"
L = 201.11'
R = 533.00'
SE = 0.035
RD = 63'
PI Sta 13+90.74
Δ = 102° 39' 39.9" (LT)
D = 100° 00' 00.0"
L = 104.66'
R = 57.29.58'
SE = EXIST
RD = EXIST
PI Sta 19+02.62
Δ = 47° 58' 02.8" (LT)
D = 5° 24' 53.3"
L = 289.25'
R = 650.00'
SE = 0.025
RD = 150'
NC 55
-Y5A-
-Y5-
-L-
N 0° 58' 22.8" E
WOODLAND RD
-Y5-
-Y5A-
-L-
TDE
TDE
ACCESS POINT
ACCESS POINT
ACCESS POINT

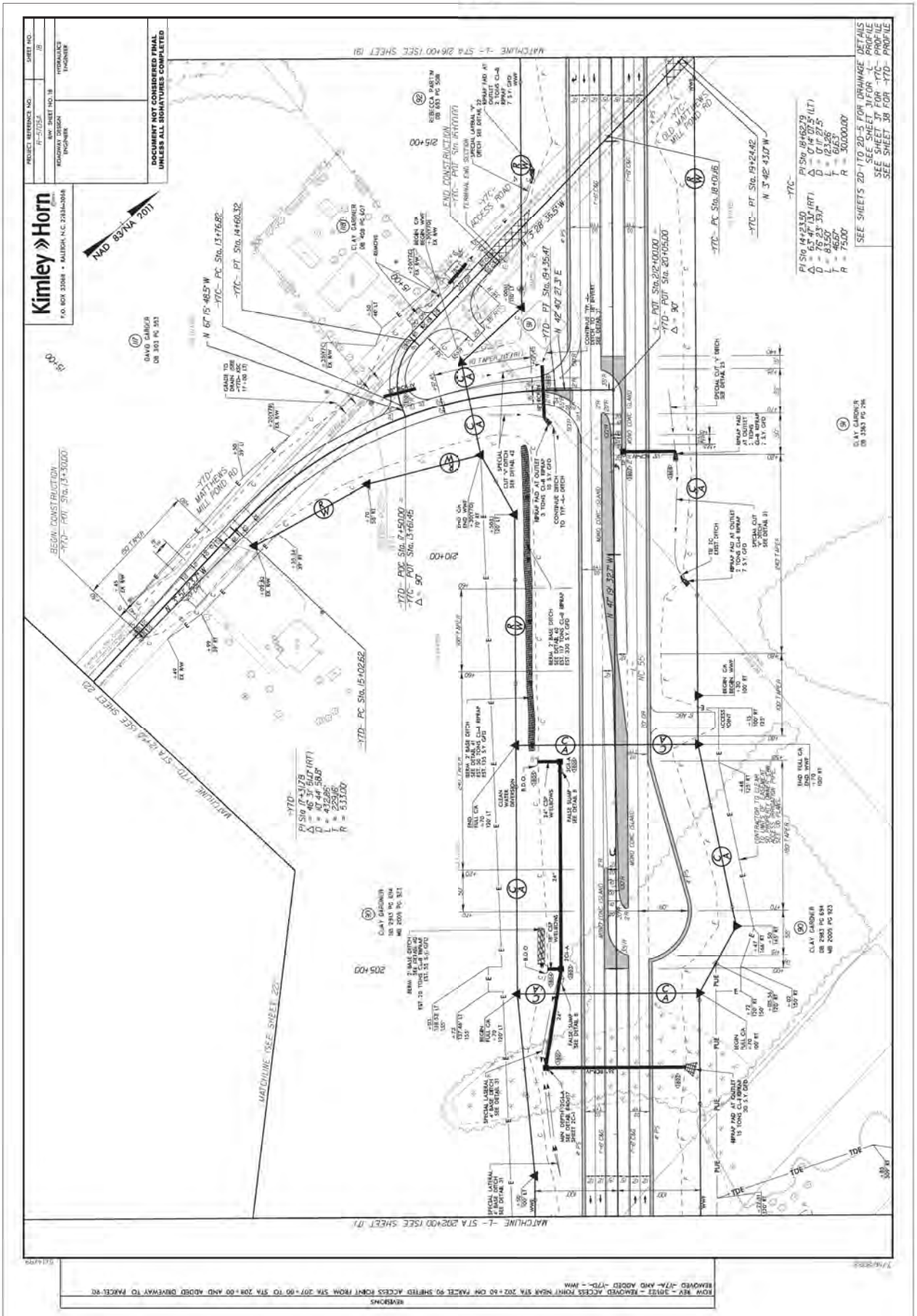

Kimley»Horn
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
SEE SHEET 28-4 FOR INTERSECTION DETAIL 2
SEE SHEETS 20-1 TO 20-5 FOR DRAINAGE DETAILS
SEE SHEET 29 FOR -L- PROFILE
MATCHLINE -L- STA 160+50 (SEE SHEET 15)
MATCHLINE -L- STA 146+50 (SEE SHEET 13)
-L- PC Sta. 152+35.90
S 84°06'40.8" W
160+00
155+00
150+00
SHIRLIGHT LLC
NORGAN FARMS INC
STEVEN WOLER
DANIEL HONEYCUTT
WILLIAM HARLEY
REVISIONS


Kimley»Horn
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
SEE SHEET 2B-4 FOR INTERSECTION DETAIL 13
SEE SHEET 2B-6 FOR INTERSECTION DETAIL 20
SEE SHEETS 20-1 TO 20-5 FOR DRAINAGE DETAILS
SEE SHEET 29 FOR -L- PROFILE
SEE SHEET 34 FOR -Y6- PROFILE
SEE SHEET 36 FOR -Y6A- PROFILE
SEE SHEET 38 FOR -DRW2- PROFILE

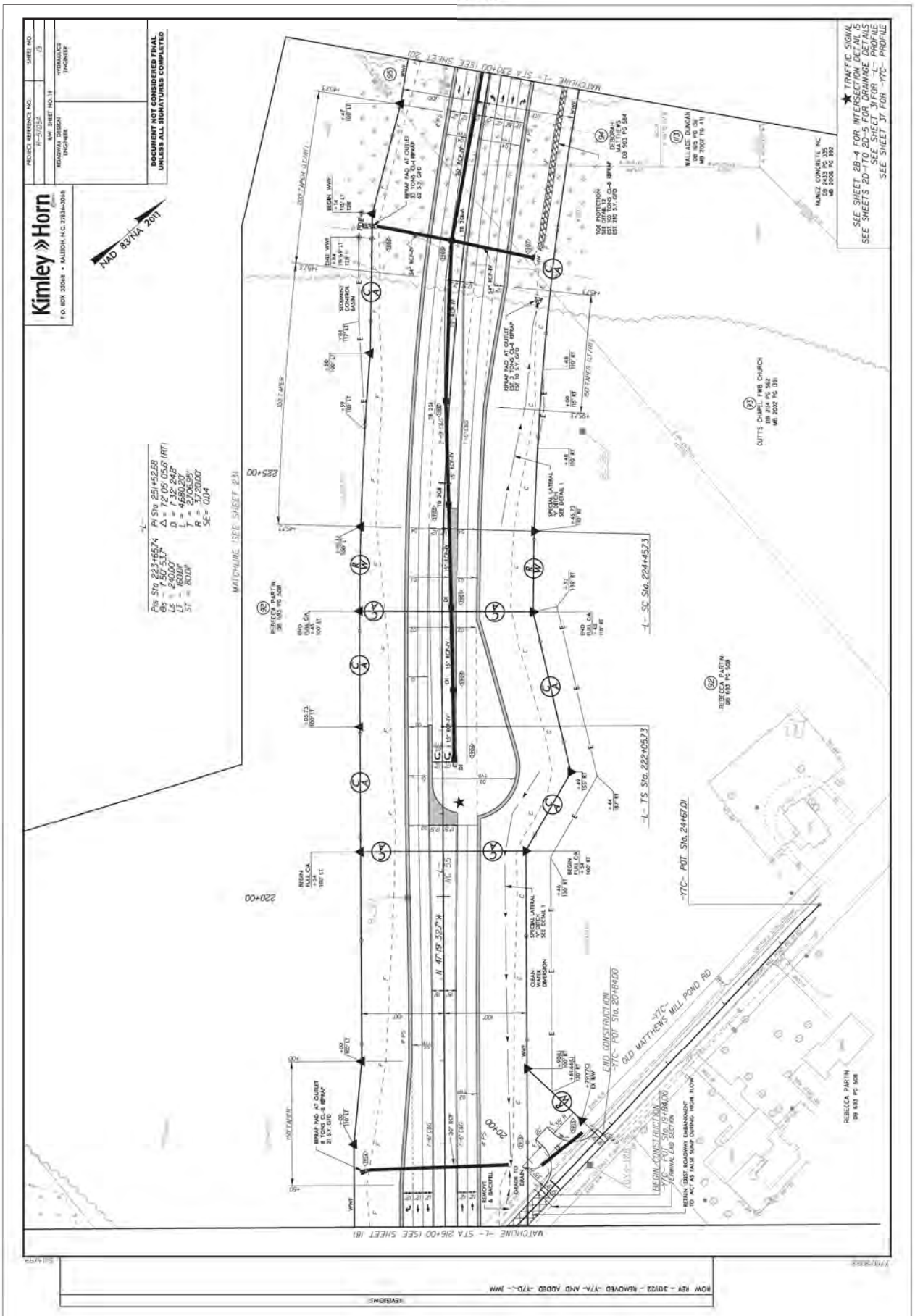

Kimley»Horn
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
SEE SHEET 28-4 FOR INTERSECTION DETAIL 14
SEE SHEETS 20-1 TO 20-5 FOR DRAINAGE DETAILS
SEE SHEET 31 FOR -L- PROFILE
SEE SHEET 38 FOR -DRW3- PROFILE
SEE SHEET 38 FOR -DRW4- PROFILE
SEE SHEET 38 FOR -DRW5- PROFILE
MATCHLINE -L- STA 174+00 (SEE SHEET 15)
MATCHLINE -L- STA 188+00 (SEE SHEET 17)
REVISIONS

P-118

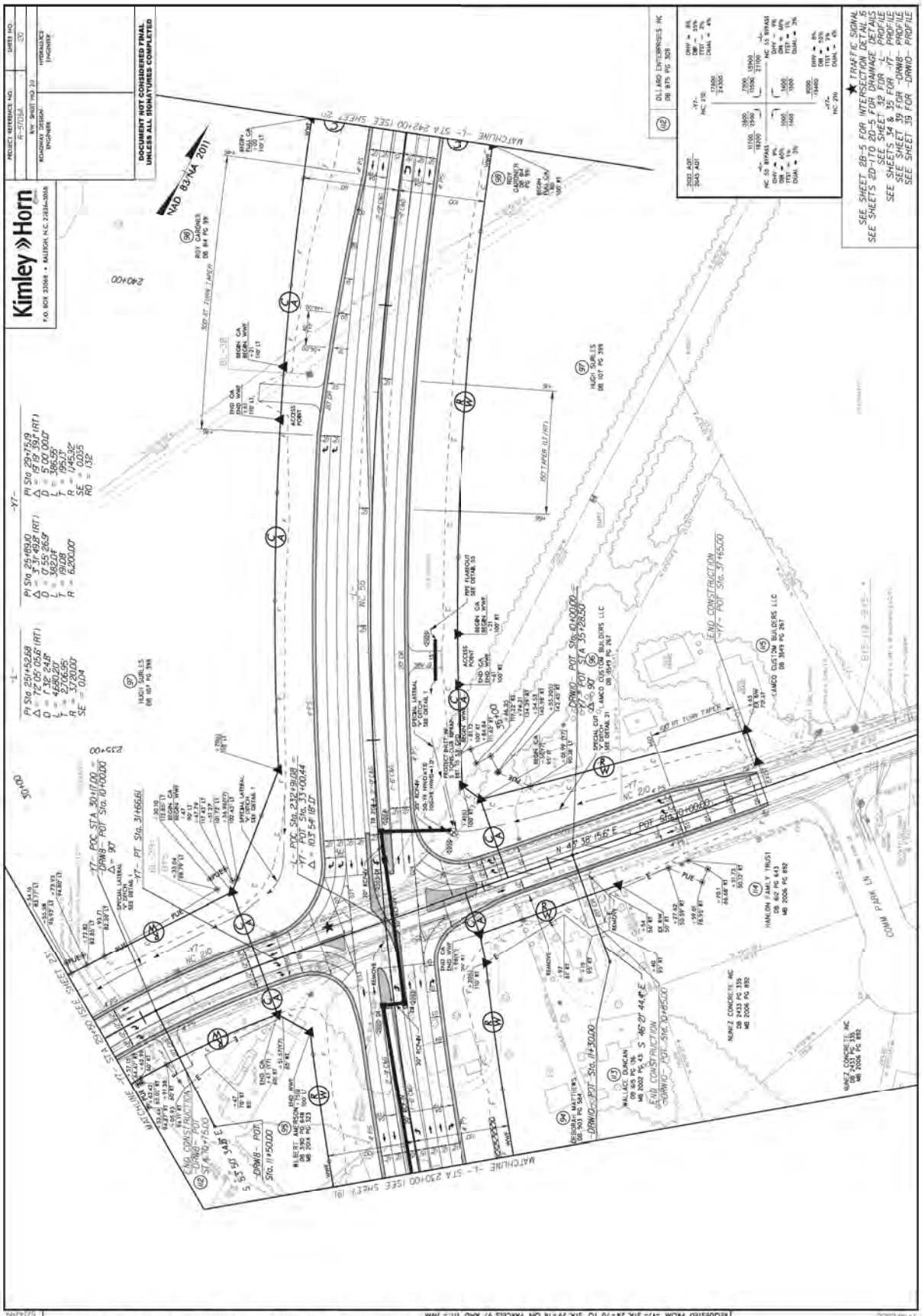

Kimley»Horn
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
MATCHLINE -L- STA 202+00 (SEE SHEET 18)
MATCHLINE -L- STA 188+00 (SEE SHEET 16)
SEE SHEETS 20-1 TO 20-5 FOR DRAINAGE DETAILS
SEE SHEET 30 FOR -L- PROFILE
SEE SHEET 37 FOR -YTB- PROFILE
SEE SHEET 39 FOR -DRW7- PROFILE
REVISIONS

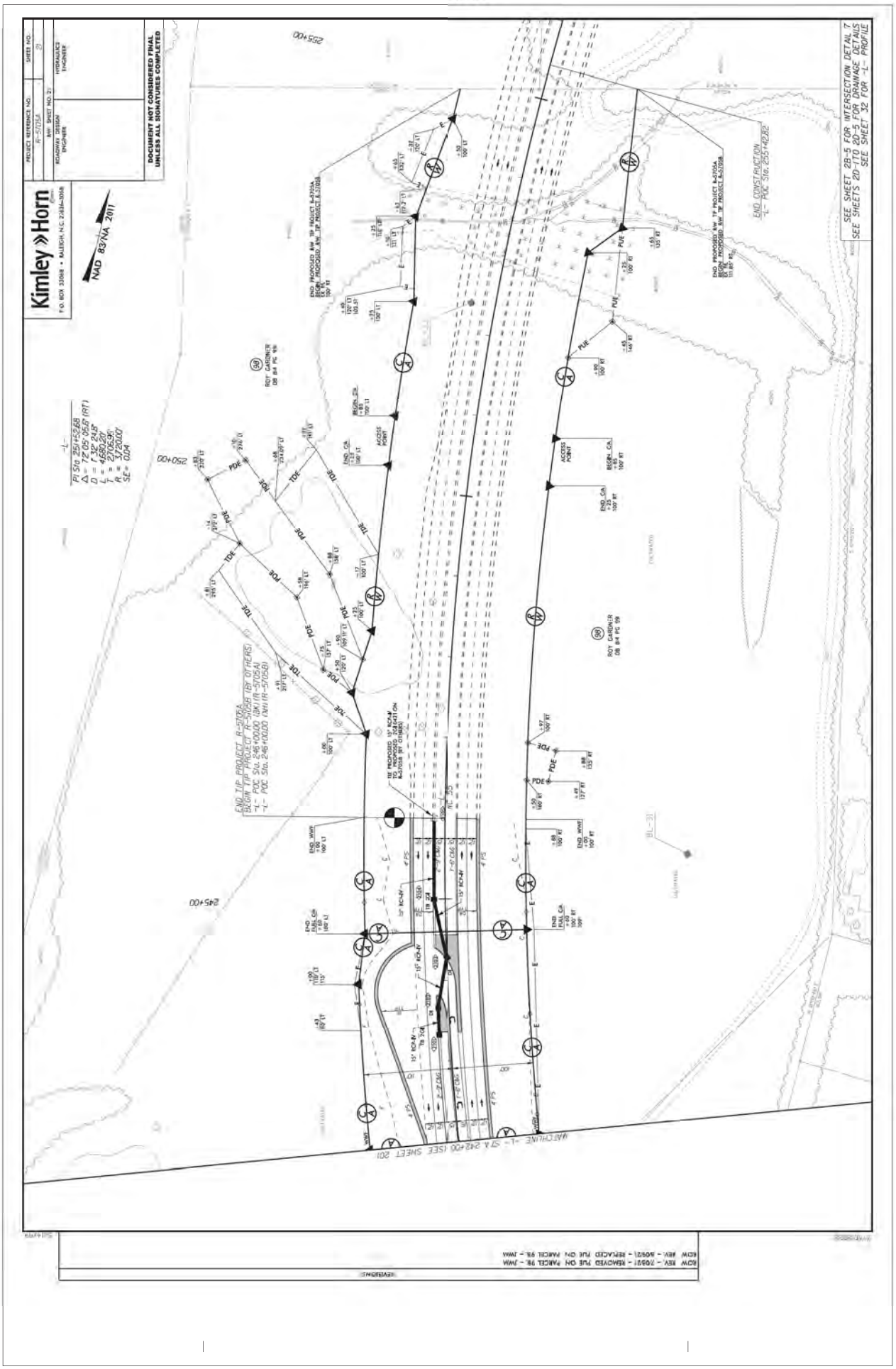

Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
NAD 83/NA 2011
PROJECT REFERENCE NO. R-5105A
SHEET NO. 18
TOTAL SHEET NO. 18
RESIDENT ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
SEE SHEETS 2D-1TO 2D-5 FOR DRAINAGE DETAILS
SEE SHEET 3I FOR -L- PROFILE
SEE SHEET 3T FOR -YTC- PROFILE
SEE SHEET 3B FOR -YTD- PROFILE
BEGIN CONSTRUCTION
END CONSTRUCTION
MATCHLINE -L- STA 216+00 (SEE SHEET 19)
MATCHLINE -L- STA 202+00 (SEE SHEET 17)
MATCHLINE -YTD- STA 12+00 (SEE SHEET 20)
MATCHLINE (SEE SHEET 20)
MATTHEWS MILL POND RD
OLD MATTHEWS MILL POND RD
ACCESS ROAD
DAVID GARNER
CLAY GARDNER
REBECCA PARTIN
NC 55
ROW REV - 3/01/23 - REMOVED ACCESS POINT NEAR STA 202+60 ON PARCEL 90 SHIFTED ACCESS POINT FROM STA 207+00 TO STA 208+00 AND ADDED DRIVEWAY TO PARCEL 90 REMOVED -YTA- AND ADDED -YTB- - JWM
REVISIONS

P-120

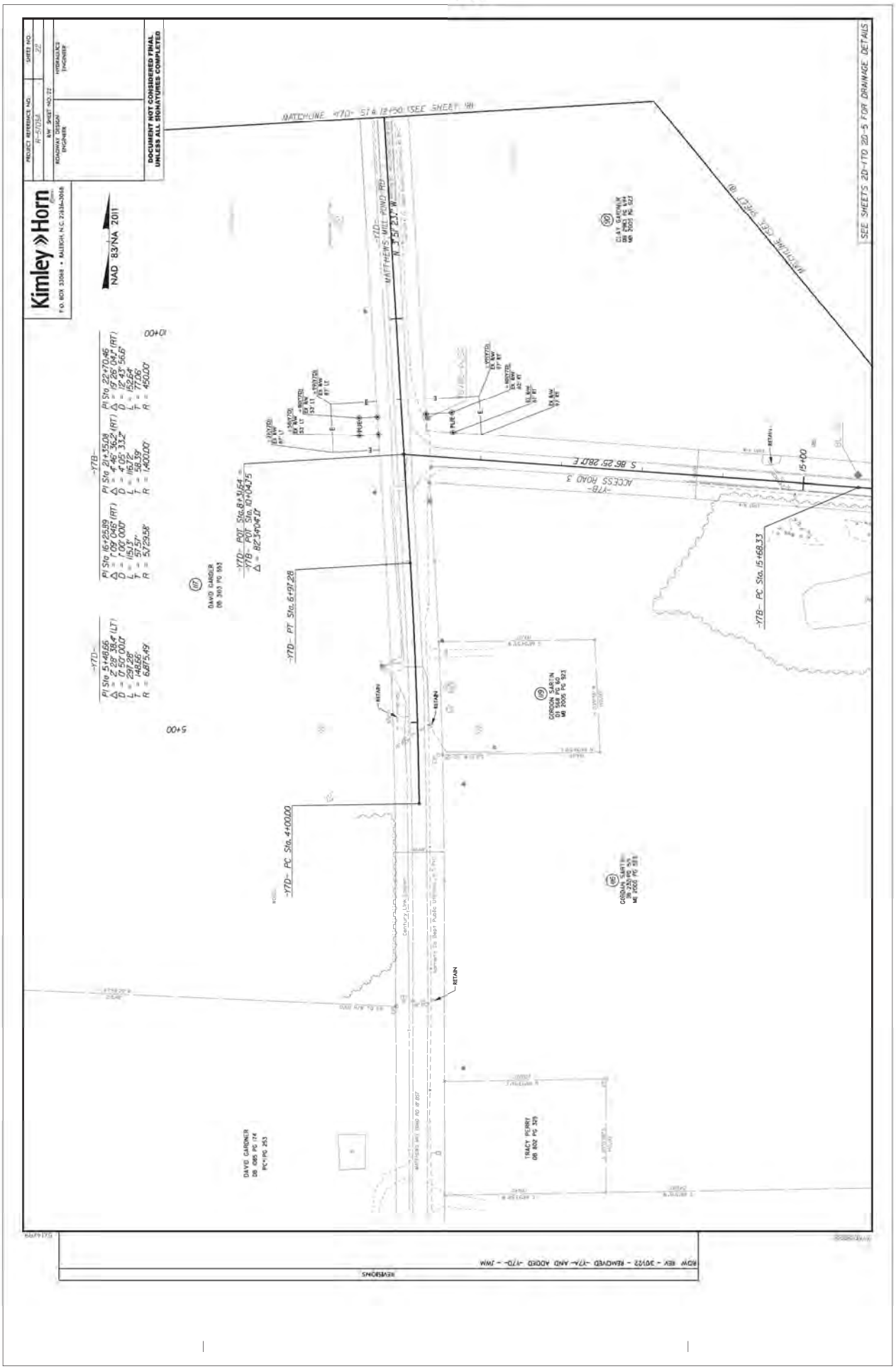


Kimley»Horn
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
MATCHLINE (SEE SHEET 23)
MATCHLINE -L- STA 216+00 (SEE SHEET 18)
-L- SC Sta. 224+45.73
-L- TS Sta. 222+05.73
-YTC- POT Sta. 24+67.01
END CONSTRUCTION -YTC- POT Sta. 20+84.00
OLD MATTHEWS MILL POND RD
REBECCA PARTIN
CUTTS CHAPEL FWB CHURCH
TRAFFIC SIGNAL
SEE SHEET 2B-4 FOR INTERSECTION DETAIL 5
SEE SHEETS 2D-1 TO 2D-5 FOR DRAINAGE DETAILS
SEE SHEET 31 FOR -L- PROFILE
SEE SHEET 37 FOR -YTC- PROFILE

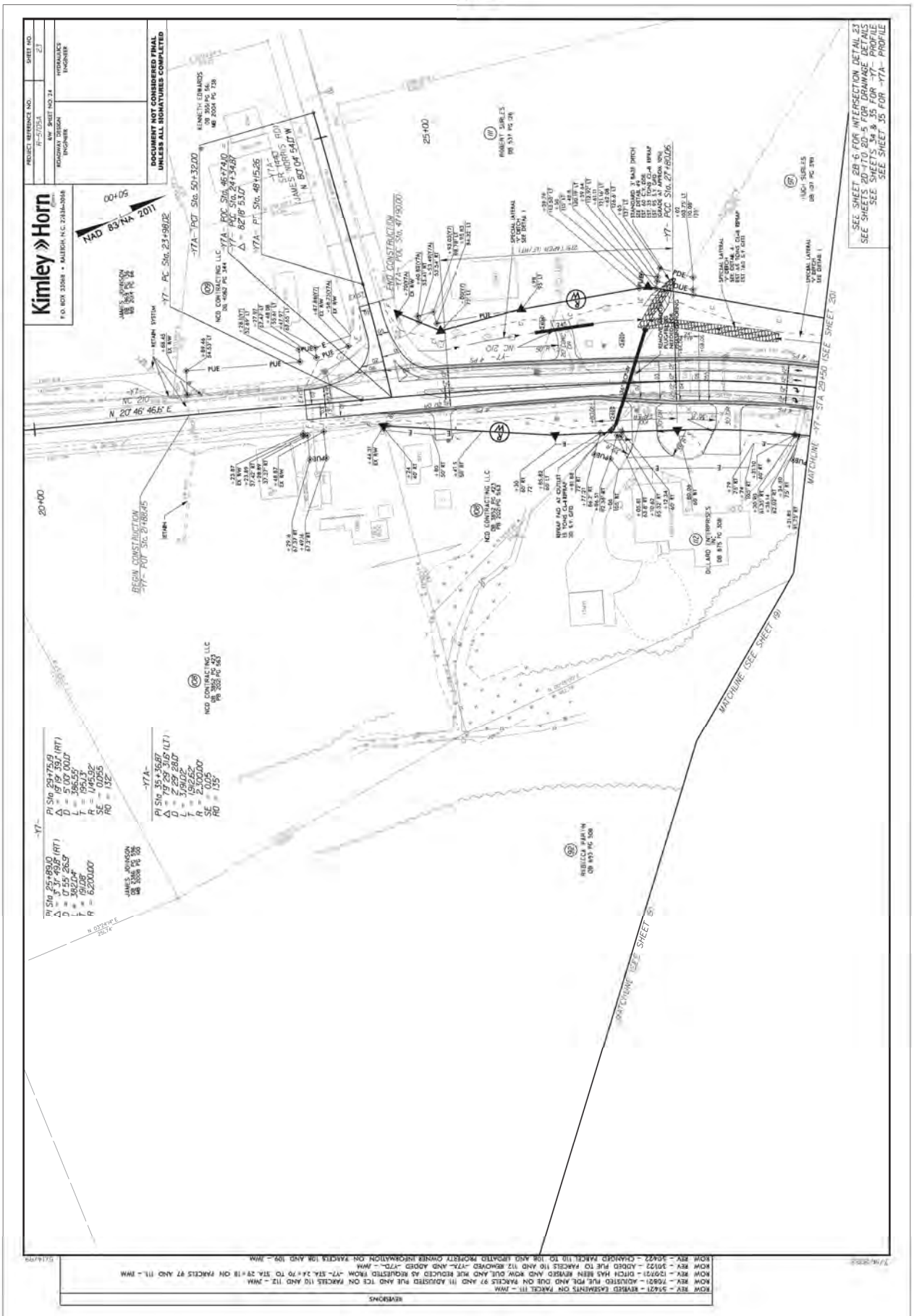

Kimley»Horn
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
PROJECT REFERENCE NO. R-5705A
SHEET NO. 20
R/W SHEET NO. 20
RESIDENT ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/NA 2011
MATCHLINE -L- STA 242+00 (SEE SHEET 20)
MATCHLINE -L- STA 230+00 (SEE SHEET 19)
SEE SHEET 28-5 FOR INTERSECTION DETAILS
SEE SHEETS 20-11 TO 20-5 FOR DRAINAGE DETAILS
SEE SHEET 32 FOR -L- PROFILE
SEE SHEETS 34 & 35 FOR -Y- PROFILE
SEE SHEET 39 FOR -DRW8- PROFILE
SEE SHEET 35 FOR -DRW0- PROFILE
★ TRAFFIC SIGNAL
END CONSTRUCTION
-L- POC Sta. 232+91.08 = -Y- POT Sta. 33+00.44
Δ = 103°54'18"D
-Y- POC STA. 30+17.00 = -DRW8- POT Sta. 10+00.00
Δ = 90°
-Y- PT Sta. 31+65.61
-Y- POT Sta. 0+00.00 = -DRW0- POT STA. 35+28.50
Δ = 90°
-Y- POT Sta. 37+65.00
-DRW0- POT Sta. 11+30.00
-DRW8- POT Sta. 11+50.00
-DRW8- POT STA. 10+15.00
-Y- Pi Sta. 25+89.00
Δ = 3°31'49.8" (RT)
D = 0°55'26.9"
L = 382.21'
R = 6200.00'
-Y- Pi Sta. 29+75.09
Δ = 16°19'39.8" (RT)
D = 5°00'00.0"
L = 386.58'
R = 1145.92'
SE = 0.035
RO = 132
-L- Pi Sta. 25+52.68
Δ = 72°05'05.6" (RT)
D = 1°32'24.8"
L = 4680.20'
R = 3726.66'
SE = 0.04
HUGH SURLES DB 107 PG 399
ROY GARDNER DB 84 PG 99
DOLLARD ENTERPRISES INC DB 875 PG 328
LAMCO CUSTOM BUILDERS LLC DB 3649 PG 267
HARLON J AND Y TRUST DB 962 PG 643 MB 2006 PG 892
NUNEZ CONCRETE INC DB 2433 PG 339 MB 2006 PG 892
WALLACE DUNCAN DB 605 PG 196
DEBORAH MATTHEWS DB 903 PG 584
ROBERT NAPERSON DB 3190 PG 648 MB 2004 PG 323
REVISIONS
ROW REV - 7/18/2021 - SHIFTED PUE AND ADJUSTED TCE ON PARCELS 93 AND 112, SHIFTED PUE ON PARCEL 97 - JWM
ROW REV - 8/6/21 - ADDED ACCESS POINT TO PARCEL 97 NEAR STATION 239+00 LT. - JWM
ROW REV - 9/30/21 - MOVED DBW10 TO -Y7- STA 35+28.50 - JWM
ROW REV - 12/02/21 - SHIFTED ACCESS POINT FROM STA 239+04 TO STA 239+91 AND ADDED DRIVEWAY TO PARCEL 97, DITCH HAS BEEN REVISED AND ROW, DUE, AND PUE REDUCED AS REQUESTED FROM -Y7- STA 24+70 TO STA 29+18 ON PARCELS 97 AND 111. - JWM
7/19/2022
5/14/22


Kimley»Horn
NAD 83/NA 2011
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
SEE SHEET 2B-5 FOR INTERSECTION DETAIL 7
SEE SHEETS 2D-1 TO 2D-5 FOR DRAINAGE DETAILS
SEE SHEET 32 FOR -L- PROFILE
END CONSTRUCTION
-L- POC Sta. 255+42.82
END TIP PROJECT R-5705A
BEGIN TIP PROJECT R-5705B (BY OTHERS)
-L- POC Sta. 246+00.00 (BK) (R-5705A)
-L- POC Sta. 246+00.00 (AH) (R-5705B)
ROY GARDNER
ACCESS POINT
WATCHLINE -L- STA. 242+00 (SEE SHEET 20)
255+00
250+00
245+00

P-123



Kimley»Horn
NAD 83/NA 2011
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
MATCHLINE -Y7D- STA 12+50 (SEE SHEET 18)
MATCHLINE (SEE SHEET 18)
SEE SHEETS 2D-1 TO 2D-5 FOR DRAINAGE DETAILS
-Y7D- PT Sta. 6+97.28
-Y7D- PC Sta. 4+00.00
-Y7B- PC Sta. 15+68.33
ACCESS ROAD 3
S 86° 25' 28.0" E
DAVID GARDNER
GORDON SARTIN
TRACY PERRY
RETAIN
REVISIONS



REVISIONS

ROW REV - 3/14/21 - REVISED EASEMENTS ON PARCEL 111 - JWM
ROW REV - 7/06/21 - ADJUSTED PLE AND PDE ON PARCELS 97 AND 111 ADJUSTED PLE AND TCE ON PARCELS 110 AND 112 - JWM
ROW REV - 12/07/21 - DITCH HAS BEEN REVISED AND ROW, DLE AND PDE REDUCED AS REQUESTED FROM -Y7- STA. 24+70 TO STA 29+18 ON PARCELS 97 AND 111 - JWM
ROW REV - 3/01/22 - ADDED PLE TO PARCELS 110 AND 112 REMOVED -Y7A- AND ADDED -Y7D- - JWM
ROW REV - 3/04/22 - CHANGED PARCEL 110 TO 108 AND UPDATED PROPERTY OWNER INFORMATION ON PARCELS 108 AND 109 - JWM

7/14/2022

County: HARNETT

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
			ROADWAY ITEMS			
0001	0000100000-N	800	MOBILIZATION	Lump Sum	L.S.	
0002	0000400000-N	801	CONSTRUCTION SURVEYING	Lump Sum	L.S.	
0003	0001000000-E	200	CLEARING & GRUBBING .. ACRE(S)	Lump Sum	L.S.	
0004	0008000000-E	200	SUPPLEMENTARY CLEARING & GRUBBING	1 ACR		
0005	0022000000-E	225	UNCLASSIFIED EXCAVATION	118,000 CY		
0006	0036000000-E	225	UNDERCUT EXCAVATION	37,500 CY		
0007	0106000000-E	230	BORROW EXCAVATION	286,500 CY		
0008	0134000000-E	240	DRAINAGE DITCH EXCAVATION	3,390 CY		
0009	0141000000-E	240	BERM DITCH CONSTRUCTION	1,110 LF		
0010	0156000000-E	250	REMOVAL OF EXISTING ASPHALT PAVEMENT	15,600 SY		
0011	0177000000-E	250	BREAKING OF EXISTING ASPHALT PAVEMENT	3,300 SY		
0012	0192000000-N	260	PROOF ROLLING	32 HR		
0013	0194000000-E	265	SELECT GRANULAR MATERIAL, CLASS III	47,000 CY		
0014	0196000000-E	270	GEOTEXTILE FOR SOIL STABILIZATION	57,500 SY		
0015	0199000000-E	SP	TEMPORARY SHORING	4,300 SF		
0016	0255000000-E	SP	GENERIC GRADING ITEM HAULING AND DISPOSAL OF PETROLEUM CONTAMINATED SOIL	100 TON		
0017	0318000000-E	300	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES	3,150 TON		

County: HARNETT

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0018	0320000000-E	300	FOUNDATION CONDITIONING GEOTEXTILE	15,316 SY		
0019	0335200000-E	305	15" DRAINAGE PIPE	2,132 LF		
0020	0335300000-E	305	18" DRAINAGE PIPE	1,540 LF		
0021	0335400000-E	305	24" DRAINAGE PIPE	1,068 LF		
0022	0335500000-E	305	30" DRAINAGE PIPE	468 LF		
0023	0335600000-E	305	36" DRAINAGE PIPE	132 LF		
0024	0335800000-E	305	48" DRAINAGE PIPE	148 LF		
0025	0448000000-E	310	****" RC PIPE CULVERTS, CLASS IV (48")	428 LF		
0026	0448000000-E	310	****" RC PIPE CULVERTS, CLASS IV (54")	348 LF		
0027	0448000000-E	310	****" RC PIPE CULVERTS, CLASS IV (66")	168 LF		
0028	0448200000-E	310	15" RC PIPE CULVERTS, CLASS IV	7,976 LF		
0029	0448300000-E	310	18" RC PIPE CULVERTS, CLASS IV	1,312 LF		
0030	0448400000-E	310	24" RC PIPE CULVERTS, CLASS IV	1,356 LF		
0031	0448500000-E	310	30" RC PIPE CULVERTS, CLASS IV	1,368 LF		
0032	0448600000-E	310	36" RC PIPE CULVERTS, CLASS IV	604 LF		
0033	0448700000-E	310	42" RC PIPE CULVERTS, CLASS IV	156 LF		
0034	0582000000-E	310	15" CS PIPE CULVERTS, 0.064" THICK	64 LF		

County: HARNETT

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0035	0588000000-E	310	18" CS PIPE CULVERTS, 0.064" THICK	16 LF		
0036	0594000000-E	310	24" CS PIPE CULVERTS, 0.064" THICK	32 LF		
0037	0636000000-E	310	**" CS PIPE ELBOWS, *****" THICK (15", 0.064")	4 EA		
0038	0636000000-E	310	**" CS PIPE ELBOWS, *****" THICK (18", 0.064")	2 EA		
0039	0636000000-E	310	**" CS PIPE ELBOWS, *****" THICK (24", 0.064")	2 EA		
0040	0995000000-E	340	PIPE REMOVAL	2,127 LF		
0041	0996000000-N	350	PIPE CLEAN OUT	1 EA		
0042	1011000000-N	500	FINE GRADING	Lump Sum	L.S.	
0043	1099500000-E	505	SHALLOW UNDERCUT	1,120 CY		
0044	1099700000-E	505	CLASS IV SUBGRADE STABILIZATION	3,800 TON		
0045	1111000000-E	SP	CLASS IV AGGREGATE STABILIZATION	250 TON		
0046	1121000000-E	520	AGGREGATE BASE COURSE	86,200 TON		
0047	1220000000-E	545	INCIDENTAL STONE BASE	510 TON		
0048	1275000000-E	600	PRIME COAT	478 GAL		
0049	1297000000-E	607	MILLING ASPHALT PAVEMENT, ***" DEPTH (2-1/2")	22,100 SY		
0050	1297000000-E	607	MILLING ASPHALT PAVEMENT, ***" DEPTH (3")	1,900 SY		
0051	1330000000-E	607	INCIDENTAL MILLING	2,890 SY		

County: HARNETT

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0052	1491000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0C	9,340 TON		
0053	1503000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C	48,420 TON		
0054	1519000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	3,130 TON		
0055	1523000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	35,630 TON		
0056	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	5,055 TON		
0057	1693000000-E	654	ASPHALT PLANT MIX, PAVEMENT REPAIR	1,120 TON		
0058	2000000000-N	806	RIGHT-OF-WAY MARKERS	298 EA		
0059	2020000000-N	806	CONTROL-OF-ACCESS MARKERS	64 EA		
0060	2022000000-E	815	SUBDRAIN EXCAVATION	448 CY		
0061	2026000000-E	815	GEOTEXTILE FOR SUBSURFACE DRAINS	2,000 SY		
0062	2036000000-E	815	SUBDRAIN COARSE AGGREGATE	336 CY		
0063	2044000000-E	815	6" PERFORATED SUBDRAIN PIPE	2,000 LF		
0064	2070000000-N	815	SUBDRAIN PIPE OUTLET	4 EA		
0065	2077000000-E	815	6" OUTLET PIPE	24 LF		
0066	2209000000-E	838	ENDWALLS	33 CY		
0067	2220000000-E	838	REINFORCED ENDWALLS	16.3 CY		
0068	2275000000-E	SP	FLOWABLE FILL	2.2 CY		

County: HARNETT

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0069	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	129 EA		
0070	2297000000-E	840	MASONRY DRAINAGE STRUCTURES	25.2 CY		
0071	2308000000-E	840	MASONRY DRAINAGE STRUCTURES	80 LF		
0072	2354200000-N	840	FRAME WITH GRATE, STD 840.24	2 EA		
0073	2364000000-N	840	FRAME WITH TWO GRATES, STD 840.16	23 EA		
0074	2366000000-N	840	FRAME WITH TWO GRATES, STD 840.24	28 EA		
0075	2367000000-N	840	FRAME WITH TWO GRATES, STD 840.29	57 EA		
0076	2396000000-N	840	FRAME WITH COVER, STD 840.54	3 EA		
0077	2407000000-N	840	STEEL FRAME WITH TWO GRATES, STD 840.37	22 EA		
0078	2451000000-N	852	CONCRETE TRANSITIONAL SECTION FOR DROP INLET	102 EA		
0079	2538000000-E	846	**'-**" CONCRETE CURB & GUTTER (2'-9")	11,230 LF		
0080	2542000000-E	846	1'-6" CONCRETE CURB & GUTTER	18,960 LF		
0081	2612000000-E	848	6" CONCRETE DRIVEWAY	1,380 SY		
0082	2619000000-E	850	4" CONCRETE PAVED DITCH	70 SY		
0083	2655000000-E	852	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)	9,010 SY		
0084	3030000000-E	862	STEEL BEAM GUARDRAIL	1,200 LF		
0085	3105000000-N	862	STEEL BEAM GUARDRAIL TERMINAL SECTIONS	14 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0086	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	10 EA		
0087	3210000000-N	862	GUARDRAIL END UNITS, TYPE CAT-1	4 EA		
0088	3287000000-N	SP	GUARDRAIL END UNITS, TYPE TL-3	4 EA		
0089	3360000000-E	863	REMOVE EXISTING GUARDRAIL	860 LF		
0090	3503000000-E	866	WOVEN WIRE FENCE, 47" FABRIC	24,410 LF		
0091	3509000000-E	866	4" TIMBER FENCE POSTS, 7'-6" LONG	1,529 EA		
0092	3515000000-E	866	5" TIMBER FENCE POSTS, 8'-0" LONG	397 EA		
0093	3564000000-E	866	SINGLE GATES, **" HIGH, **' WIDE, **' OPENING (47", 12', 12')	1 EA		
0094	3628000000-E	876	RIP RAP, CLASS I	2,350 TON		
0095	3635000000-E	876	RIP RAP, CLASS II	260 TON		
0096	3649000000-E	876	RIP RAP, CLASS B	1,210 TON		
0097	3656000000-E	876	GEOTEXTILE FOR DRAINAGE	8,270 SY		
0098	4025000000-E	901	CONTRACTOR FURNISHED, TYPE *** SIGN (D)	486 SF		
0099	4025000000-E	901	CONTRACTOR FURNISHED, TYPE *** SIGN (E)	840 SF		
0100	4025000000-E	901	CONTRACTOR FURNISHED, TYPE *** SIGN (F)	11,915 SF		
0101	4072000000-E	903	SUPPORTS, 3-LB STEEL U-CHANNEL	2,924 LF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0102	4096000000-N	904	SIGN ERECTION, TYPE D	2 EA		
0103	4102000000-N	904	SIGN ERECTION, TYPE E	103 EA		
0104	4108000000-N	904	SIGN ERECTION, TYPE F	43 EA		
0105	4155000000-N	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	40 EA		
0106	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	1,830 SF		
0107	4405000000-E	1110	WORK ZONE SIGNS (PORTABLE)	1,100 SF		
0108	4410000000-E	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	2,780 SF		
0109	4415000000-N	1115	FLASHING ARROW BOARD	2 EA		
0110	4420000000-N	1120	PORTABLE CHANGEABLE MESSAGE SIGN	4 EA		
0111	4430000000-N	1130	DRUMS	2,820 EA		
0112	4445000000-E	1145	BARRICADES (TYPE III)	1,616 LF		
0113	4455000000-N	1150	FLAGGER	1,620 DAY		
0114	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	4 EA		
0115	4470000000-N	1160	REMOVE & RESET TEMPORARY CRASH CUSHION	4 EA		
0116	4480000000-N	1165	TMA	2 EA		
0117	4490000000-E	1170	PORTABLE CONCRETE BARRIER (ANCHORED)	1,827 LF		
0118	4505000000-E	1170	REMOVE & RESET PORTABLE CONCRETE BARRIER (ANCHORED)	1,596 LF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0119	4510000000-N	1190	LAW ENFORCEMENT	240 HR		
0120	4650000000-N	1251	TEMPORARY RAISED PAVEMENT MARKERS	3,200 EA		
0121	4685000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	110,473 LF		
0122	4695000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)	14,830 LF		
0123	4700000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)	1,089 LF		
0124	4709000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (24", 90 MILS)	470 LF		
0125	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	170 EA		
0126	4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	386,140 LF		
0127	4820000000-E	1205	PAINT PAVEMENT MARKING LINES (8")	19,310 LF		
0128	4825000000-E	1205	PAINT PAVEMENT MARKING LINES (12")	610 LF		
0129	4835000000-E	1205	PAINT PAVEMENT MARKING LINES (24")	1,110 LF		
0130	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	140 EA		
0131	4850000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (4")	5,000 LF		
0132	4865000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (12")	500 LF		
0133	4870000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (24")	500 LF		
0134	4905100000-N	SP	NON-CAST IRON SNOWPLOWABLE PAVEMENT MARKER	1,562 EA		
0135	4955000000-N	1264	OBJECT MARKERS (END OF ROAD)	18 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0136	5325400000-E	1510	4" WATER LINE	834 LF		
0137	5325600000-E	1510	6" WATER LINE	6,400 LF		
0138	5325800000-E	1510	8" WATER LINE	6,475 LF		
0140	5326600000-E	1510	16" WATER LINE	7,247 LF		
0141	5329000000-E	1510	DUCTILE IRON WATER PIPE FITTINGS	42,250 LB		
0142	5540000000-E	1515	6" VALVE	7 EA		
0143	5546000000-E	1515	8" VALVE	7 EA		
0144	5558600000-E	1515	16" VALVE	1 EA		
0145	5589200000-E	1515	2" AIR RELEASE VALVE	3 EA		
0146	5648000000-N	1515	RELOCATE WATER METER	40 EA		
0147	5649000000-N	1515	RECONNECT WATER METER	2 EA		
0148	5672000000-N	1515	RELOCATE FIRE HYDRANT	12 EA		
0149	5673000000-E	1515	FIRE HYDRANT LEG	125 LF		
0150	5686500000-E	1515	WATER SERVICE LINE	2,434 LF		
0151	5798000000-E	1530	ABANDON **" UTILITY PIPE (4")	540 LF		
0152	5800000000-E	1530	ABANDON 6" UTILITY PIPE	6,043 LF		
0153	5801000000-E	1530	ABANDON 8" UTILITY PIPE	6,659 LF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0154	5810000000-E	1530	ABANDON 16" UTILITY PIPE	7,036 LF		
0155	5835600000-E	1540	12" ENCASEMENT PIPE	849 LF		
0156	5835700000-E	1540	16" ENCASEMENT PIPE	808 LF		
0157	5836200000-E	1540	30" ENCASEMENT PIPE	494 LF		
0158	5872500000-E	1550	BORE AND JACK OF **" (12")	448 LF		
0159	5872500000-E	1550	BORE AND JACK OF **" (16")	472 LF		
0160	5872500000-E	1550	BORE AND JACK OF **" (30")	161 LF		
0162	6000000000-E	1605	TEMPORARY SILT FENCE	106,450 LF		
0163	6006000000-E	1610	STONE FOR EROSION CONTROL, CLASS A	1,460 TON		
0164	6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	5,505 TON		
0165	6012000000-E	1610	SEDIMENT CONTROL STONE	4,095 TON		
0166	6015000000-E	1615	TEMPORARY MULCHING	296.5 ACR		
0167	6018000000-E	1620	SEED FOR TEMPORARY SEEDING	14,200 LB		
0168	6021000000-E	1620	FERTILIZER FOR TEMPORARY SEEDING	71.5 TON		
0169	6024000000-E	1622	TEMPORARY SLOPE DRAINS	3,565 LF		
0170	6029000000-E	SP	SAFETY FENCE	6,280 LF		
0171	6030000000-E	1630	SILT EXCAVATION	12,110 CY		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0172	6036000000-E	1631	MATTING FOR EROSION CONTROL	132,000 SY		
0173	6037000000-E	SP	COIR FIBER MAT	100 SY		
0174	6042000000-E	1632	1/4" HARDWARE CLOTH	4,400 LF		
0175	6043000000-E	SP	LOW PERMEABILITY GEOTEXTILE	210 SY		
0176	6045000000-E	SP	**" TEMPORARY PIPE (18")	40 LF		
0177	6045000000-E	SP	**" TEMPORARY PIPE (48")	220 LF		
0178	6046000000-E	1636	TEMPORARY PIPE FOR STREAM CROSSING	125 LF		
0179	6070000000-N	1639	SPECIAL STILLING BASINS	22 EA		
0180	6071012000-E	SP	COIR FIBER WATTLE	12,100 LF		
0181	6071020000-E	SP	POLYACRYLAMIDE (PAM)	4,330 LB		
0182	6071030000-E	1640	COIR FIBER BAFFLE	2,500 LF		
0183	6071050000-E	SP	**" SKIMMER (1-1/2")	7 EA		
0184	6071050000-E	SP	**" SKIMMER (2")	3 EA		
0185	6084000000-E	1660	SEEDING & MULCHING	250 ACR		
0186	6087000000-E	1660	MOWING	192 ACR		
0187	6090000000-E	1661	SEED FOR REPAIR SEEDING	3,000 LB		
0188	6093000000-E	1661	FERTILIZER FOR REPAIR SEEDING	8.25 TON		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0189	6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	5,075 LB		
0190	6108000000-E	1665	FERTILIZER TOPDRESSING	152 TON		
0191	6111000000-E	SP	IMPERVIOUS DIKE	185 LF		
0192	6114500000-N	1667	SPECIALIZED HAND MOWING	10 MHR		
0193	6114800000-N	SP	MANUAL LITTER REMOVAL	107 MHR		
0194	6114900000-E	SP	LITTER DISPOSAL	7 TON		
0195	6117000000-N	SP	RESPONSE FOR EROSION CONTROL	100 EA		
0196	6117500000-N	SP	CONCRETE WASHOUT STRUCTURE	8 EA		
0197	6120000000-E	SP	CULVERT DIVERSION CHANNEL	730 CY		
0198	7060000000-E	1705	SIGNAL CABLE	1,925 LF		
0199	7120000000-E	1705	VEHICLE SIGNAL HEAD (12", 3 SECTION)	17 EA		
0200	7132000000-E	1705	VEHICLE SIGNAL HEAD (12", 4 SECTION)	4 EA		
0201	7279000000-E	1715	TRACER WIRE	1,425 LF		
0202	7300000000-E	1715	UNPAVED TRENCHING (**********) (2, 2")	2,800 LF		
0203	7301000000-E	1715	DIRECTIONAL DRILL (**********) (2, 2")	800 LF		
0204	7312000000-N	1716	JUNCTION BOX (**********) (SPECIAL OVERSIZED, HEAVY DUTY)	2 EA		
0205	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	16 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0206	7348000000-N	1716	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)	6 EA		
0207	7444000000-E	1725	INDUCTIVE LOOP SAWCUT	1,600 LF		
0208	7456000000-E	1726	LEAD-IN CABLE (**********) (14-2)	4,325 LF		
0209	7516000000-E	1730	COMMUNICATIONS CABLE (** FIBER) (12)	575 LF		
0210	7516000000-E	1730	COMMUNICATIONS CABLE (** FIBER) (24)	1,275 LF		
0211	7540000000-N	1731	SPLICE ENCLOSURE	2 EA		
0212	7552000000-N	1731	INTERCONNECT CENTER	3 EA		
0213	7566000000-N	1733	DELINEATOR MARKER	5 EA		
0214	7588000000-N	SP	METAL POLE WITH SINGLE MAST ARM	3 EA		
0215	7613000000-N	SP	SOIL TEST	3 EA		
0216	7614100000-E	SP	DRILLED PIER FOUNDATION	16.5 CY		
0217	7631000000-N	SP	MAST ARM WITH METAL POLE DESIGN	3 EA		
0218	7636000000-N	1745	SIGN FOR SIGNALS	5 EA		
0219	7642200000-N	1743	TYPE II PEDESTAL WITH FOUNDATION	7 EA		
0220	7684000000-N	1750	SIGNAL CABINET FOUNDATION	3 EA		
0221	7696000000-N	1751	CONTROLLERS WITH CABINET (**********) (TYPE 2070LX, BASE MOUNTED)	3 EA		
0222	7744000000-N	1751	DETECTOR CARD (TYPE 170)	10 EA		

County: HARNETT

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0223	7901000000-N	1753	CABINET BASE EXTENDER	3 EA		
0224	7980000000-N	SP	GENERIC SIGNAL ITEM DIGITAL CCTV CAMERA ASSEMBLY	1 EA		
0225	7980000000-N	SP	GENERIC SIGNAL ITEM ETHERNET EDGE SWITCH	3 EA		
			CULVERT ITEMS			
0226	8126000000-N	414	CULVERT EXCAVATION, STA ****** (181+58.77 -L-)	Lump Sum	L.S.	
0227	8126000000-N	414	CULVERT EXCAVATION, STA ****** (198+61.03 -L-)	Lump Sum	L.S.	
0228	8126000000-N	414	CULVERT EXCAVATION, STA ****** (24+46.00 -L-)	Lump Sum	L.S.	
0229	8133000000-E	414	FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	339 TON		
0230	8140000000-E	416	CHANNEL EXCAVATION	1,065 CY		
0231	8196000000-E	420	CLASS A CONCRETE (CULVERT)	484.6 CY		
0232	8245000000-E	425	REINFORCING STEEL (CULVERT)	56,826 LB		

Vendor 1 of 5: BARNHILL CONTRACTING CO (3516)
Call Order 003 (Proposal: C204785)

Bid Information

Proposal County: HARNETT

Vendor Address: P.O. Box 7948
ROCKY MOUNT , NC , 27804

Signature Check: Tony Christopher Stroud

Time Bid Received: September 19, 2023 12:56 PM

Amendment Count: 1

Bid Checksum: FCEA9CD83A

Bid Total: $48,441,330.83

Items Total: $48,441,330.83

Time Total: $0.00

Bidding Errors:
None.

DBE GOAL SET: 6%
DBE GOAL OBT: 6.17%

Vendor 1 of 5: BARNHILL CONTRACTING CO (3516)
Call Order 003 (Proposal: C204785)

Bid Bond Information

Projects:		**Bond Maximum:**	
Counties:		**State of Incorporation:**	
Bond ID:	SNC08311032	**Agency Execution Date:**	08/31/2023 04
Paid by Check:	No	**Surety Name:**	Surety2000
Bond Percent:	5%	**Bond Agency Name:**	Travelers Casualty and Surety Company of America

DBE Load Information

Letting ID: L230919
Letting Date: 09/19/2023
Call Order: 003
Contract ID: C204785
Project: STATE FUNDEDSTATE FUNDEDSTATE FUNDEDSTATE FUNDED
Bid Total: $48,441,330.83
DBE Goal: 6.00% ($2,906,479.85)

DBE GOAL SET: 6%
DBE GOAL OBT: 6.17%

Vendor ID: 3516
Vendor Name: Barnhill Contracting Company
DBE Entered: 6.17% ($2,988,068.18)

Vendor ID	DBE Name	Is Supplier?	City/State	Goods/Service	Amount
7420	HALL'S TREE SERVICE INC	False	977 ELLIS RD , LUMBER BRIDGE, NC 28357	SubContractor Committed	200,000.00
12278	CLIFTON CONSTRUCTION CO INC	False	1435 GIDDENSVILLE ROAD , FAISON, NC 28341	SubContractor Committed	96,520.00
4247	SEAL BROTHERS CONTRACTING LLC	False	131 W. CLEVE STREET , MOUNT AIRY, NC 27030	SubContractor Committed	346,044.18
4289	VISTABUTION LLC	False	1407 GAYLORD DR. , RALEIGH, NC 27612	SubContractor Committed	6,600.00
11036	JK PERKINS LLC	False	6560 RHEMISH DRIVE , FAYETTEVILLE, NC 28304	SubContractor Committed	299,448.00
5059	GARRETT TRUCKING INC	False	1701 ELLIOT FARM ROAD , FAYETTEVILLE, NC 28311	SubContractor Committed	299,448.00
3346	LINEBERRY INC	False	POST OFFICE BOX 307 , CLIMAX, NC 27233	SubContractor Committed	1,682,600.00
15450	DIXON PAVING INC	False	4801 GLENWOOD AVENUE SUITE 200 , RALEIGH, NC 27612	SubContractor Committed	57,408.00

BondID: SNC08311032
Surety Registry Agency: Surety2000
Verified?: 1
Surety Agency: Travelers Casualty and Surety Company of America
Bond Execution Date: 08/31/2023 04:17:20 PM

Line Number	Item Number	Quantity	Unit	Unit Price	Extension Price
Section 0001 ROADWAY ITEMS					
0001	0000100000-N MOBILIZATION	1.000	LS	$2,422,000.0000	$2,422,000.00
0002	0000400000-N CONSTRUCTION SURVEYING	1.000	LS	$1,500,000.0000	$1,500,000.00
0003	0001000000-E CLEARING & GRUBBING .. ACRE(S)	1	LS	$3,000,000.0000	$3,000,000.00
0004	0008000000-E SUPPLEMENTARY CLEARING & GRUBBING	1.000	ACR	$5,000.0000	$5,000.00
0005	0022000000-E UNCLASSIFIED EXCAVATION	118000.000	CY	$5.0000	$590,000.00
0006	0036000000-E UNDERCUT EXCAVATION	37500.000	CY	$11.1500	$418,125.00
0007	0106000000-E BORROW EXCAVATION	286500.000	CY	$5.0000	$1,432,500.00
0008	0134000000-E DRAINAGE DITCH EXCAVATION	3390.000	CY	$9.3000	$31,527.00
0009	0141000000-E BERM DITCH CONSTRUCTION	1110.000	LF	$6.6000	$7,326.00
0010	0156000000-E REMOVAL OF EXISTING ASPHALT PAVEMENT	15600.000	SY	$7.4000	$115,440.00
0011	0177000000-E BREAKING OF EXISTING ASPHALT PAVEMENT	3300.000	SY	$3.6000	$11,880.00
0012	0192000000-N PROOF ROLLING	32.000	HR	$125.0000	$4,000.00
0013	0194000000-E SELECT GRANULAR MATERIAL, CLASS III	47000.000	CY	$15.0000	$705,000.00
0014	0196000000-E GEOTEXTILE FOR SOIL STABILIZATION	57500.000	SY	$1.0000	$57,500.00
0015	0199000000-E TEMPORARY SHORING	4300.000	SF	$60.1000	$258,430.00
0016	0255000000-E GENERIC GRADING ITEM HAULING AND DISPOSAL OF PETROLEUM CONTAMINATED SOIL	100.000	TON	$72.5000	$7,250.00
0017	0318000000-E FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES	3150.000	TON	$65.0000	$204,750.00
0018	0320000000-E FOUNDATION CONDITIONING GEOTEXTILE	15316.000	SY	$2.9000	$44,416.40
0019	0335200000-E 15" DRAINAGE PIPE	2132.000	LF	$95.5000	$203,606.00
0020	0335300000-E 18" DRAINAGE PIPE	1540.000	LF	$78.8000	$121,352.00
0021	0335400000-E 24" DRAINAGE PIPE	1068.000	LF	$94.4000	$100,819.20
0022	0335500000-E 30" DRAINAGE PIPE	468.000	LF	$120.6000	$56,440.80
0023	0335600000-E 36" DRAINAGE PIPE	132.000	LF	$162.1000	$21,397.20

0024	0335800000-E	148.000	LF	$279.8000	$41,410.40
	48" DRAINAGE PIPE				
0025	0448000000-E	428.000	LF	$362.1000	$154,978.80
	****" RC PIPE CULVERTS, CLASS IV (48")				
0026	0448000000-E	348.000	LF	$432.9000	$150,649.20
	****" RC PIPE CULVERTS, CLASS IV (54")				
0027	0448000000-E	168.000	LF	$690.2000	$115,953.60
	****" RC PIPE CULVERTS, CLASS IV (66")				
0028	0448200000-E	7976.000	LF	$77.6000	$618,937.60
	15" RC PIPE CULVERTS, CLASS IV				
0029	0448300000-E	1312.000	LF	$103.8000	$136,185.60
	18" RC PIPE CULVERTS, CLASS IV				
0030	0448400000-E	1356.000	LF	$123.1000	$166,923.60
	24" RC PIPE CULVERTS, CLASS IV				
0031	0448500000-E	1368.000	LF	$177.3000	$242,546.40
	30" RC PIPE CULVERTS, CLASS IV				
0032	0448600000-E	604.000	LF	$213.2000	$128,772.80
	36" RC PIPE CULVERTS, CLASS IV				
0033	0448700000-E	156.000	LF	$257.5000	$40,170.00
	42" RC PIPE CULVERTS, CLASS IV				
0034	0582000000-E	64.000	LF	$80.7000	$5,164.80
	15" CS PIPE CULVERTS, 0.064" THICK				
0035	0588000000-E	16.000	LF	$111.0000	$1,776.00
	18" CS PIPE CULVERTS, 0.064" THICK				
0036	0594000000-E	32.000	LF	$95.8000	$3,065.60
	24" CS PIPE CULVERTS, 0.064" THICK				
0037	0636000000-E	4.000	EA	$527.5000	$2,110.00
	" CS PIPE ELBOWS, ***" THICK (15", 0.064")				
0038	0636000000-E	2.000	EA	$560.5000	$1,121.00
	" CS PIPE ELBOWS, ***" THICK (18", 0.064")				
0039	0636000000-E	2.000	EA	$696.6000	$1,393.20
	" CS PIPE ELBOWS, ***" THICK (24", 0.064")				
0040	0995000000-E	2127.000	LF	$35.9000	$76,359.30
	PIPE REMOVAL				
0041	0996000000-N	1.000	EA	$5,031.0000	$5,031.00
	PIPE CLEAN OUT				
0042	1011000000-N	1.000	LS	$7,836,745.0000	$7,836,745.00
	FINE GRADING				
0043	1099500000-E	1120.000	CY	$7.8000	$8,736.00
	SHALLOW UNDERCUT				
0044	1099700000-E	3800.000	TON	$31.5000	$119,700.00
	CLASS IV SUBGRADE STABILIZATION				
0045	1111000000-E	250.000	TON	$32.0000	$8,000.00
	CLASS IV AGGREGATE STABILIZATION				
0046	1121000000-E	86200.000	TON	$35.0500	$3,021,310.00
	AGGREGATE BASE COURSE				
0047	1220000000-E	510.000	TON	$100.0000	$51,000.00
	INCIDENTAL STONE BASE				
0048	1275000000-E	478.000	GAL	$25.0000	$11,950.00

	PRIME COAT				
0049	1297000000-E	22100.000	SY	$3.0500	$67,405.00
	MILLING ASPHALT PAVEMENT, ***" DEPTH (2-1/2")				
0050	1297000000-E	1900.000	SY	$6.5000	$12,350.00
	MILLING ASPHALT PAVEMENT, ***" DEPTH (3")				
0051	1330000000-E	2890.000	SY	$12.5000	$36,125.00
	INCIDENTAL MILLING				
0052	1491000000-E	9340.000	TON	$80.3000	$750,002.00
	ASPHALT CONC BASE COURSE, TYPE B25.0C				
0053	1503000000-E	48420.000	TON	$60.0000	$2,905,200.00
	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C				
0054	1519000000-E	3130.000	TON	$96.2800	$301,356.40
	ASPHALT CONC SURFACE COURSE, TYPE S9.5B				
0055	1523000000-E	35630.000	TON	$71.8000	$2,558,234.00
	ASPHALT CONC SURFACE COURSE, TYPE S9.5C				
0056	1575000000-E	5055.000	TON	$650.0000	$3,285,750.00
	ASPHALT BINDER FOR PLANT MIX				
0057	1693000000-E	1120.000	TON	$177.5000	$198,800.00
	ASPHALT PLANT MIX, PAVEMENT REPAIR				
0058	2000000000-N	298.000	EA	$450.0000	$134,100.00
	RIGHT-OF-WAY MARKERS				
0059	2020000000-N	64.000	EA	$450.0000	$28,800.00
	CONTROL-OF-ACCESS MARKERS				
0060	2022000000-E	448.000	CY	$30.0000	$13,440.00
	SUBDRAIN EXCAVATION				
0061	2026000000-E	2000.000	SY	$11.0000	$22,000.00
	GEOTEXTILE FOR SUBSURFACE DRAINS				
0062	2036000000-E	336.000	CY	$70.0000	$23,520.00
	SUBDRAIN COARSE AGGREGATE				
0063	2044000000-E	2000.000	LF	$16.0000	$32,000.00
	6" PERFORATED SUBDRAIN PIPE				
0064	2070000000-N	4.000	EA	$400.0000	$1,600.00
	SUBDRAIN PIPE OUTLET				
0065	2077000000-E	24.000	LF	$40.0000	$960.00
	6" OUTLET PIPE				
0066	2209000000-E	33.000	CY	$2,705.0000	$89,265.00
	ENDWALLS				
0067	2220000000-E	16.300	CY	$1,790.0000	$29,177.00
	REINFORCED ENDWALLS				
0068	2275000000-E	2.200	CY	$3,844.0000	$8,456.80
	FLOWABLE FILL				
0069	2286000000-N	129.000	EA	$5,136.0000	$662,544.00
	MASONRY DRAINAGE STRUCTURES				
0070	2297000000-E	25.200	CY	$4,060.0000	$102,312.00
	MASONRY DRAINAGE STRUCTURES				
0071	2308000000-E	80.000	LF	$226.0000	$18,080.00
	MASONRY DRAINAGE STRUCTURES				
0072	2354200000-N	2.000	EA	$1,245.0000	$2,490.00
	FRAME WITH GRATE, STD 840.24				

0073	2364000000-N	23.000	EA	$1,488.0000	$34,224.00
	FRAME WITH TWO GRATES, STD 840.16				
0074	2366000000-N	28.000	EA	$1,410.0000	$39,480.00
	FRAME WITH TWO GRATES, STD 840.24				
0075	2367000000-N	57.000	EA	$1,423.0000	$81,111.00
	FRAME WITH TWO GRATES, STD 840.29				
0076	2396000000-N	3.000	EA	$1,274.0000	$3,822.00
	FRAME WITH COVER, STD 840.54				
0077	2407000000-N	22.000	EA	$3,422.0000	$75,284.00
	STEEL FRAME WITH TWO GRATES, STD 840.37				
0078	2451000000-N	102.000	EA	$1,625.0000	$165,750.00
	CONCRETE TRANSITIONAL SECTION FOR DROP INLET				
0079	2538000000-E	11230.000	LF	$26.7500	$300,402.50
	'-" CONCRETE CURB & GUTTER (2'-9")				
0080	2542000000-E	18960.000	LF	$20.1500	$382,044.00
	1'-6" CONCRETE CURB & GUTTER				
0081	2612000000-E	1380.000	SY	$88.2500	$121,785.00
	6" CONCRETE DRIVEWAY				
0082	2619000000-E	70.000	SY	$242.2500	$16,957.50
	4" CONCRETE PAVED DITCH				
0083	2655000000-E	9010.000	SY	$78.8000	$709,988.00
	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)				
0084	3030000000-E	1200.000	LF	$24.0000	$28,800.00
	STEEL BEAM GUARDRAIL				
0085	3105000000-N	14.000	EA	$75.0000	$1,050.00
	STEEL BEAM GUARDRAIL TERMINAL SECTIONS				
0086	3150000000-N	10.000	EA	$55.0000	$550.00
	ADDITIONAL GUARDRAIL POSTS				
0087	3210000000-N	4.000	EA	$975.0000	$3,900.00
	GUARDRAIL END UNITS, TYPE CAT-1				
0088	3287000000-N	4.000	EA	$3,300.0000	$13,200.00
	GUARDRAIL END UNITS, TYPE TL-3				
0089	3360000000-E	860.000	LF	$1.0000	$860.00
	REMOVE EXISTING GUARDRAIL				
0090	3503000000-E	24410.000	LF	$4.5000	$109,845.00
	WOVEN WIRE FENCE, 47" FABRIC				
0091	3509000000-E	1529.000	EA	$32.0000	$48,928.00
	4" TIMBER FENCE POSTS, 7'-6" LONG				
0092	3515000000-E	397.000	EA	$38.0000	$15,086.00
	5" TIMBER FENCE POSTS, 8'-0" LONG				
0093	3564000000-E	1.000	EA	$2,500.0000	$2,500.00
	SINGLE GATES, **" HIGH, **' WIDE, **' OPENING (47", 12', 12')				
0094	3628000000-E	2350.000	TON	$61.9000	$145,465.00
	RIP RAP, CLASS I				
0095	3635000000-E	260.000	TON	$64.3000	$16,718.00
	RIP RAP, CLASS II				
0096	3649000000-E	1210.000	TON	$61.9000	$74,899.00
	RIP RAP, CLASS B				
0097	3656000000-E	8270.000	SY	$3.9000	$32,253.00

	GEOTEXTILE FOR DRAINAGE				
0098	4025000000-E	486.000	SF	$23.0000	$11,178.00
	CONTRACTOR FURNISHED, TYPE *** SIGN (D)				
0099	4025000000-E	840.000	SF	$21.0000	$17,640.00
	CONTRACTOR FURNISHED, TYPE *** SIGN (E)				
0100	4025000000-E	11915.000	SF	$10.0000	$119,150.00
	CONTRACTOR FURNISHED, TYPE *** SIGN (F)				
0101	4072000000-E	2924.000	LF	$7.4900	$21,900.76
	SUPPORTS, 3-LB STEEL U-CHANNEL				
0102	4096000000-N	2.000	EA	$190.0000	$380.00
	SIGN ERECTION, TYPE D				
0103	4102000000-N	103.000	EA	$80.0000	$8,240.00
	SIGN ERECTION, TYPE E				
0104	4108000000-N	43.000	EA	$135.0000	$5,805.00
	SIGN ERECTION, TYPE F				
0105	4155000000-N	40.000	EA	$4.5000	$180.00
	DISPOSAL OF SIGN SYSTEM, U-CHANNEL				
0106	4400000000-E	1830.000	SF	$7.6500	$13,999.50
	WORK ZONE SIGNS (STATIONARY)				
0107	4405000000-E	1100.000	SF	$34.7000	$38,170.00
	WORK ZONE SIGNS (PORTABLE)				
0108	4410000000-E	2780.000	SF	$16.4000	$45,592.00
	WORK ZONE SIGNS (BARRICADE MOUNTED)				
0109	4415000000-N	2.000	EA	$8,393.0000	$16,786.00
	FLASHING ARROW BOARD				
0110	4420000000-N	4.000	EA	$16,008.0000	$64,032.00
	PORTABLE CHANGEABLE MESSAGE SIGN				
0111	4430000000-N	2820.000	EA	$61.0000	$172,020.00
	DRUMS				
0112	4445000000-E	1616.000	LF	$37.9000	$61,246.40
	BARRICADES (TYPE III)				
0113	4455000000-N	1620.000	DAY	$200.0000	$324,000.00
	FLAGGER				
0114	4465000000-N	4.000	EA	$11,250.0000	$45,000.00
	TEMPORARY CRASH CUSHIONS				
0115	4470000000-N	4.000	EA	$2,950.0000	$11,800.00
	REMOVE & RESET TEMPORARY CRASH CUSHION				
0116	4480000000-N	2.000	EA	$34,753.0000	$69,506.00
	TMA				
0117	4490000000-E	1827.000	LF	$59.9000	$109,437.30
	PORTABLE CONCRETE BARRIER (ANCHORED)				
0118	4505000000-E	1596.000	LF	$18.5000	$29,526.00
	REMOVE & RESET PORTABLE CONCRETE BARRIER (ANCHORED)				
0119	4510000000-N	240.000	HR	$78.0000	$18,720.00
	LAW ENFORCEMENT				
0120	4650000000-N	3200.000	EA	$11.3500	$36,320.00
	TEMPORARY RAISED PAVEMENT MARKERS				
0121	4685000000-E	110473.000	LF	$0.6400	$70,702.72
	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)				

0122	4695000000-E	14830.000	LF	$1.1700	$17,351.10
	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)				
0123	4700000000-E	1089.000	LF	$3.6500	$3,974.85
	THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)				
0124	4709000000-E	470.000	LF	$18.0000	$8,460.00
	THERMOPLASTIC PAVEMENT MARKING LINES (24", 90 MILS)				
0125	4725000000-E	170.000	EA	$120.0000	$20,400.00
	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)				
0126	4810000000-E	386140.000	LF	$0.1900	$73,366.60
	PAINT PAVEMENT MARKING LINES (4")				
0127	4820000000-E	19310.000	LF	$0.2900	$5,599.90
	PAINT PAVEMENT MARKING LINES (8")				
0128	4825000000-E	610.000	LF	$2.0000	$1,220.00
	PAINT PAVEMENT MARKING LINES (12")				
0129	4835000000-E	1110.000	LF	$3.0000	$3,330.00
	PAINT PAVEMENT MARKING LINES (24")				
0130	4845000000-N	140.000	EA	$40.0000	$5,600.00
	PAINT PAVEMENT MARKING SYMBOL				
0131	4850000000-E	5000.000	LF	$1.5000	$7,500.00
	REMOVAL OF PAVEMENT MARKING LINES (4")				
0132	4865000000-E	500.000	LF	$3.0000	$1,500.00
	REMOVAL OF PAVEMENT MARKING LINES (12")				
0133	4870000000-E	500.000	LF	$5.0000	$2,500.00
	REMOVAL OF PAVEMENT MARKING LINES (24")				
0134	4905100000-N	1562.000	EA	$47.2500	$73,804.50
	NON-CAST IRON SNOWPLOWABLE PAVEMENT MARKER				
0135	4955000000-N	18.000	EA	$85.0000	$1,530.00
	OBJECT MARKERS (END OF ROAD)				
0136	5325400000-E	834.000	LF	$113.0000	$94,242.00
	4" WATER LINE				
0137	5325600000-E	6400.000	LF	$82.0000	$524,800.00
	6" WATER LINE				
0138	5325800000-E	6475.000	LF	$86.0000	$556,850.00
	8" WATER LINE				
0140	5326600000-E	7247.000	LF	$218.0000	$1,579,846.00
	16" WATER LINE				
0141	5329000000-E	42250.000	LB	$10.0000	$422,500.00
	DUCTILE IRON WATER PIPE FITTINGS				
0142	5540000000-E	7.000	EA	$3,000.0000	$21,000.00
	6" VALVE				
0143	5546000000-E	7.000	EA	$3,800.0000	$26,600.00
	8" VALVE				
0144	5558600000-E	1.000	EA	$15,000.0000	$15,000.00
	16" VALVE				
0145	5589200000-E	3.000	EA	$10,200.0000	$30,600.00
	2" AIR RELEASE VALVE				
0146	5648000000-N	40.000	EA	$1,800.0000	$72,000.00
	RELOCATE WATER METER				
0147	5649000000-N	2.000	EA	$1,800.0000	$3,600.00

	RECONNECT WATER METER				
0148	5672000000-N	12.000	EA	$10,000.0000	$120,000.00
	RELOCATE FIRE HYDRANT				
0149	5673000000-E	125.000	LF	$70.0000	$8,750.00
	FIRE HYDRANT LEG				
0150	5686500000-E	2434.000	LF	$38.0000	$92,492.00
	WATER SERVICE LINE				
0151	5798000000-E	540.000	LF	$10.0000	$5,400.00
	ABANDON **" UTILITY PIPE (4")				
0152	5800000000-E	6043.000	LF	$12.0000	$72,516.00
	ABANDON 6" UTILITY PIPE				
0153	5801000000-E	6659.000	LF	$16.0000	$106,544.00
	ABANDON 8" UTILITY PIPE				
0154	5810000000-E	7036.000	LF	$26.0000	$182,936.00
	ABANDON 16" UTILITY PIPE				
0155	5835600000-E	849.000	LF	$136.0000	$115,464.00
	12" ENCASEMENT PIPE				
0156	5835700000-E	808.000	LF	$216.0000	$174,528.00
	16" ENCASEMENT PIPE				
0157	5836200000-E	494.000	LF	$588.0000	$290,472.00
	30" ENCASEMENT PIPE				
0158	5872500000-E	448.000	LF	$302.0000	$135,296.00
	BORE AND JACK OF **" (12")				
0159	5872500000-E	472.000	LF	$464.0000	$219,008.00
	BORE AND JACK OF **" (16")				
0160	5872500000-E	161.000	LF	$770.0000	$123,970.00
	BORE AND JACK OF **" (30")				
0162	6000000000-E	106450.000	LF	$1.0000	$106,450.00
	TEMPORARY SILT FENCE				
0163	6006000000-E	1460.000	TON	$79.4000	$115,924.00
	STONE FOR EROSION CONTROL, CLASS A				
0164	6009000000-E	5505.000	TON	$30.0000	$165,150.00
	STONE FOR EROSION CONTROL, CLASS B				
0165	6012000000-E	4095.000	TON	$30.0000	$122,850.00
	SEDIMENT CONTROL STONE				
0166	6015000000-E	296.500	ACR	$1,275.0000	$378,037.50
	TEMPORARY MULCHING				
0167	6018000000-E	14200.000	LB	$3.0000	$42,600.00
	SEED FOR TEMPORARY SEEDING				
0168	6021000000-E	71.500	TON	$900.0000	$64,350.00
	FERTILIZER FOR TEMPORARY SEEDING				
0169	6024000000-E	3565.000	LF	$33.0000	$117,645.00
	TEMPORARY SLOPE DRAINS				
0170	6029000000-E	6280.000	LF	$1.8500	$11,618.00
	SAFETY FENCE				
0171	6030000000-E	12110.000	CY	$1.0000	$12,110.00
	SILT EXCAVATION				
0172	6036000000-E	132000.000	SY	$1.0000	$132,000.00
	MATTING FOR EROSION CONTROL				

0173	6037000000-E	100.000	SY	$6.5000	$650.00
	COIR FIBER MAT				
0174	6042000000-E	4400.000	LF	$21.0000	$92,400.00
	1/4" HARDWARE CLOTH				
0175	6043000000-E	210.000	SY	$5.1000	$1,071.00
	LOW PERMEABILITY GEOTEXTILE				
0176	6045000000-E	40.000	LF	$110.0000	$4,400.00
	**" TEMPORARY PIPE (18")				
0177	6045000000-E	220.000	LF	$131.5000	$28,930.00
	**" TEMPORARY PIPE (48")				
0178	6046000000-E	125.000	LF	$97.8000	$12,225.00
	TEMPORARY PIPE FOR STREAM CROSSING				
0179	6070000000-N	22.000	EA	$2,595.0000	$57,090.00
	SPECIAL STILLING BASINS				
0180	6071012000-E	12100.000	LF	$5.0000	$60,500.00
	COIR FIBER WATTLE				
0181	6071020000-E	4330.000	LB	$1.0000	$4,330.00
	POLYACRYLAMIDE (PAM)				
0182	6071030000-E	2500.000	LF	$9.5000	$23,750.00
	COIR FIBER BAFFLE				
0183	6071050000-E	7.000	EA	$2,377.0000	$16,639.00
	**" SKIMMER (1-1/2")				
0184	6071050000-E	3.000	EA	$2,519.0000	$7,557.00
	**" SKIMMER (2")				
0185	6084000000-E	250.000	ACR	$2,850.0000	$712,500.00
	SEEDING & MULCHING				
0186	6087000000-E	192.000	ACR	$200.0000	$38,400.00
	MOWING				
0187	6090000000-E	3000.000	LB	$10.0000	$30,000.00
	SEED FOR REPAIR SEEDING				
0188	6093000000-E	8.250	TON	$1,500.0000	$12,375.00
	FERTILIZER FOR REPAIR SEEDING				
0189	6096000000-E	5075.000	LB	$7.5000	$38,062.50
	SEED FOR SUPPLEMENTAL SEEDING				
0190	6108000000-E	152.000	TON	$1,050.0000	$159,600.00
	FERTILIZER TOPDRESSING				
0191	6111000000-E	185.000	LF	$80.0000	$14,800.00
	IMPERVIOUS DIKE				
0192	6114500000-N	10.000	MHR	$125.0000	$1,250.00
	SPECIALIZED HAND MOWING				
0193	6114800000-N	107.000	MHR	$20.0000	$2,140.00
	MANUAL LITTER REMOVAL				
0194	6114900000-E	7.000	TON	$300.0000	$2,100.00
	LITTER DISPOSAL				
0195	6117000000-N	100.000	EA	$300.0000	$30,000.00
	RESPONSE FOR EROSION CONTROL				
0196	6117500000-N	8.000	EA	$2,266.0000	$18,128.00
	CONCRETE WASHOUT STRUCTURE				
0197	6120000000-E	730.000	CY	$25.0000	$18,250.00

	CULVERT DIVERSION CHANNEL				
0198	7060000000-E	1925.000	LF	$3.2800	$6,314.00
	SIGNAL CABLE				
0199	7120000000-E	17.000	EA	$1,200.0000	$20,400.00
	VEHICLE SIGNAL HEAD (12", 3 SECTION)				
0200	7132000000-E	4.000	EA	$1,400.0000	$5,600.00
	VEHICLE SIGNAL HEAD (12", 4 SECTION)				
0201	7279000000-E	1425.000	LF	$2.0000	$2,850.00
	TRACER WIRE				
0202	7300000000-E	2800.000	LF	$15.0000	$42,000.00
	UNPAVED TRENCHING (**********) (2, 2")				
0203	7301000000-E	800.000	LF	$30.0000	$24,000.00
	DIRECTIONAL DRILL (**********) (2, 2")				
0204	7312000000-N	2.000	EA	$1,800.0000	$3,600.00
	JUNCTION BOX (**********) (SPECIAL OVERSIZED, HEAVY DUTY)				
0205	7324000000-N	16.000	EA	$750.0000	$12,000.00
	JUNCTION BOX (STANDARD SIZE)				
0206	7348000000-N	6.000	EA	$1,400.0000	$8,400.00
	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)				
0207	7444000000-E	1600.000	LF	$13.0000	$20,800.00
	INDUCTIVE LOOP SAWCUT				
0208	7456000000-E	4325.000	LF	$2.0000	$8,650.00
	LEAD-IN CABLE (**********) (14-2)				
0209	7516000000-E	575.000	LF	$7.0000	$4,025.00
	COMMUNICATIONS CABLE (** FIBER) (12)				
0210	7516000000-E	1275.000	LF	$8.0000	$10,200.00
	COMMUNICATIONS CABLE (** FIBER) (24)				
0211	7540000000-N	2.000	EA	$2,500.0000	$5,000.00
	SPLICE ENCLOSURE				
0212	7552000000-N	3.000	EA	$2,000.0000	$6,000.00
	INTERCONNECT CENTER				
0213	7566000000-N	5.000	EA	$185.0000	$925.00
	DELINEATOR MARKER				
0214	7588000000-N	3.000	EA	$36,000.0000	$108,000.00
	METAL POLE WITH SINGLE MAST ARM				
0215	7613000000-N	3.000	EA	$3,000.0000	$9,000.00
	SOIL TEST				
0216	7614100000-E	16.500	CY	$2,000.0000	$33,000.00
	DRILLED PIER FOUNDATION				
0217	7631000000-N	3.000	EA	$200.0000	$600.00
	MAST ARM WITH METAL POLE DESIGN				
0218	7636000000-N	5.000	EA	$600.0000	$3,000.00
	SIGN FOR SIGNALS				
0219	7642200000-N	7.000	EA	$3,000.0000	$21,000.00
	TYPE II PEDESTAL WITH FOUNDATION				
0220	7684000000-N	3.000	EA	$3,200.0000	$9,600.00
	SIGNAL CABINET FOUNDATION				
0221	7696000000-N	3.000	EA	$22,500.0000	$67,500.00
	CONTROLLERS WITH CABINET (**********) (TYPE 2070LX, BASE MOUNTED)				

0222	7744000000-N	10.000	EA	$200.0000	$2,000.00
	DETECTOR CARD (TYPE 170)				
0223	7901000000-N	3.000	EA	$800.0000	$2,400.00
	CABINET BASE EXTENDER				
0224	7980000000-N	1.000	EA	$6,500.0000	$6,500.00
	GENERIC SIGNAL ITEM DIGITAL CCTV CAMERA ASSEMBLY				
0225	7980000000-N	3.000	EA	$4,500.0000	$13,500.00
	GENERIC SIGNAL ITEM ETHERNET EDGE SWITCH				
Section 0001 Total					$47,622,247.33

Section 0002
CULVERT ITEMS

0226	8126000000-N	1.000	LS	$54,500.0000	$54,500.00
	CULVERT EXCAVATION, STA ****** (181+58.77 -L-)				
0227	8126000000-N	1.000	LS	$57,500.0000	$57,500.00
	CULVERT EXCAVATION, STA ****** (198+61.03 -L-)				
0228	8126000000-N	1.000	LS	$92,500.0000	$92,500.00
	CULVERT EXCAVATION, STA ****** (24+46.00 -L-)				
0229	8133000000-E	339.000	TON	$75.0000	$25,425.00
	FOUNDATION CONDITIONING MATERIAL, BOX CULVERT				
0230	8140000000-E	1065.000	CY	$35.0000	$37,275.00
	CHANNEL EXCAVATION				
0231	8196000000-E	484.600	CY	$875.0000	$424,025.00
	CLASS A CONCRETE (CULVERT)				
0232	8245000000-E	56826.000	LB	$2.2500	$127,858.50
	REINFORCING STEEL (CULVERT)				
Section 0002 Total					$819,083.50

Item Total	$48,441,330.83

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.

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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

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:

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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** ○ **No** ◉

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

Contract Number
County

Contract Number
County

Contract Number
County

Contract Number
County

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

that have a total value not to exceed the award limit and will result in the lowest total bids to the Department of Transportation.

DBE List Summary

Project: STATE FUNDED
Bid Total: 48,441,330.83
Goal: 6.00% (2,906,479.85)
Total Entered: 6.17% (2,988,068.18)

Bidder ID: 3516
Business Name: Barnhill Contracting Company

ID	Name	Is Supplier?	Item Count	Amount	Is Complete?
7420	HALL'S TREE SERVICE INC	False	3	200,000.00	True
12278	CLIFTON CONSTRUCTION CO INC	False	7	96,520.00	True
4247	SEAL BROTHERS CONTRACTING LLC	False	7	346,044.18	True
4289	VISTABUTION LLC	False	1	6,600.00	True
11036	JK PERKINS LLC	False	1	299,448.00	True
5059	GARRETT TRUCKING INC	False	1	299,448.00	True
3346	LINEBERRY INC	False	12	1,682,600.00	True
15450	DIXON PAVING INC	False	4	57,408.00	True

Name: HALL'S TREE SERVICE INC ID: 7420

Address: 977 ELLIS RD , LUMBER BRIDGE, NC 28357

Used As: SubContractor DBE Items Total:$200,000.00

Items for HALL'S TREE SERVICE INC

0001 ROADWAY ITEMS					
0001	0000100000-N MOBILIZATION	1.000	LS	$9,000.0000	$9,000.00
Note: Mob					
0003	0001000000-E CLEARING & GRUBBING .. ACRE(S)	1	LS	$180,000.0000	$180,000.00
0004	0008000000-E SUPPLEMENTARY CLEARING & GRUBBING	1.000	ACR	$11,000.0000	$11,000.00
Section 0001 Total					$200,000.00
Item Total					$200,000.00

Name: CLIFTON CONSTRUCTION CO INC ID: 12278

Address: 1435 GIDDENSVILLE ROAD , FAISON, NC 28341

Used As: SubContractor DBE Items Total:$96,520.00

Items for CLIFTON CONSTRUCTION CO INC

0001 ROADWAY ITEMS					
0001	0000100000-N MOBILIZATION	1.000	LS	$3,000.0000	$3,000.00
Note: Mob					
0060	2022000000-E SUBDRAIN EXCAVATION	448.000	CY	$30.0000	$13,440.00
0061	2026000000-E GEOTEXTILE FOR SUBSURFACE DRAINS	2000.000	SY	$11.0000	$22,000.00
0062	2036000000-E SUBDRAIN COARSE AGGREGATE	336.000	CY	$70.0000	$23,520.00
0063	2044000000-E 6" PERFORATED SUBDRAIN PIPE	2000.000	LF	$16.0000	$32,000.00
0064	2070000000-N SUBDRAIN PIPE OUTLET	4.000	EA	$400.0000	$1,600.00
0065	2077000000-E 6" OUTLET PIPE	24.000	LF	$40.0000	$960.00
Section 0001 Total					$96,520.00
Item Total					$96,520.00

Name: SEAL BROTHERS CONTRACTING LLC ID: 4247

Address: 131 W. CLEVE STREET , MOUNT AIRY, NC 27030

Used As: SubContractor DBE Items Total:$346,044.18

Items for SEAL BROTHERS CONTRACTING LLC

0001 ROADWAY ITEMS					
0001	0000100000-N MOBILIZATION	1.000	LS	$6,785.1800	$6,785.18
Note: Mob					
0058	2000000000-N RIGHT-OF-WAY MARKERS	298.000	EA	$450.0000	$134,100.00
0059	2020000000-N CONTROL-OF-ACCESS MARKERS	64.000	EA	$450.0000	$28,800.00
0090	3503000000-E WOVEN WIRE FENCE, 47" FABRIC	24410.000	LF	$4.5000	$109,845.00
0091	3509000000-E 4" TIMBER FENCE POSTS, 7'-6" LONG	1529.000	EA	$32.0000	$48,928.00
0092	3515000000-E 5" TIMBER FENCE POSTS, 8'-0" LONG	397.000	EA	$38.0000	$15,086.00
0093	3564000000-E SINGLE GATES, **" HIGH, **' WIDE, **' OPENING (47", 12', 12')	1.000	EA	$2,500.0000	$2,500.00
Section 0001 Total					$346,044.18
Item Total					$346,044.18

Name: VISTABUTION LLC ID: 4289

Address: 1407 GAYLORD DR. , RALEIGH, NC 27612

Used As: SubContractor DBE Items Total:$6,600.00

Items for VISTABUTION LLC

0001 ROADWAY ITEMS					
0016	0255000000-E	100.000	TON	$66.0000	$6,600.00
	GENERIC GRADING ITEM HAULING AND DISPOSAL OF PETROLEUM CONTAMINATED SOIL				
Section 0001 Total					$6,600.00
Item Total					$6,600.00

Name: JK PERKINS LLC ID: 11036

Address: 6560 RHEMISH DRIVE , FAYETTEVILLE, NC 28304

Used As: SubContractor DBE Items Total:$299,448.00

Items for JK PERKINS LLC

0001 ROADWAY ITEMS				
0053	1503000000-E ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C	33272 TON	$9.0000	$299,448.00
Section 0001 Total				$299,448.00
Item Total				$299,448.00

Name: GARRETT TRUCKING INC ID: 5059

Address: 1701 ELLIOT FARM ROAD , FAYETTEVILLE, NC 28311

Used As: SubContractor DBE Items Total:$299,448.00

Items for GARRETT TRUCKING INC

0001 ROADWAY ITEMS					
0055	1523000000-E	33272	TON	$9.0000	$299,448.00
	ASPHALT CONC SURFACE COURSE, TYPE S9.5C				
Note: Hauling					
Section 0001 Total					$299,448.00
Item Total					$299,448.00

Name: LINEBERRY INC ID: 3346

Address: POST OFFICE BOX 307 , CLIMAX, NC 27233

Used As: SubContractor DBE Items Total:$1,682,600.00

Items for LINEBERRY INC

0001 ROADWAY ITEMS					
0166	6015000000-E	296.500	ACR	$1,275.0000	$378,037.50
	TEMPORARY MULCHING				
0167	6018000000-E	14200.000	LB	$3.0000	$42,600.00
	SEED FOR TEMPORARY SEEDING				
0168	6021000000-E	71.500	TON	$900.0000	$64,350.00
	FERTILIZER FOR TEMPORARY SEEDING				
0172	6036000000-E	132000.000	SY	$1.4000	$184,800.00
	MATTING FOR EROSION CONTROL				
0185	6084000000-E	250.000	ACR	$2,850.0000	$712,500.00
	SEEDING & MULCHING				
0186	6087000000-E	192.000	ACR	$200.0000	$38,400.00
	MOWING				
0187	6090000000-E	3000.000	LB	$10.0000	$30,000.00
	SEED FOR REPAIR SEEDING				
0188	6093000000-E	8.250	TON	$1,500.0000	$12,375.00
	FERTILIZER FOR REPAIR SEEDING				
0189	6096000000-E	5075.000	LB	$7.5000	$38,062.50
	SEED FOR SUPPLEMENTAL SEEDING				
0190	6108000000-E	152.000	TON	$1,050.0000	$159,600.00
	FERTILIZER TOPDRESSING				
0192	6114500000-N	10.000	MHR	$125.0000	$1,250.00
	SPECIALIZED HAND MOWING				
0195	6117000000-N	75	EA	$275.0000	$20,625.00
	RESPONSE FOR EROSION CONTROL				
Section 0001 Total					$1,682,600.00
Item Total					$1,682,600.00

Name: DIXON PAVING INC ID: 15450

Address: 4801 GLENWOOD AVENUE SUITE 200 , RALEIGH, NC 27612

Used As: SubContractor DBE Items Total:$57,408.00

Items for DIXON PAVING INC

0001 ROADWAY ITEMS					
0010	0156000000-E	15600.000	SY	$1.5600	$24,336.00
	REMOVAL OF EXISTING ASPHALT PAVEMENT				
Note: Milling					
0011	0177000000-E	3300.000	SY	$1.5600	$5,148.00
	BREAKING OF EXISTING ASPHALT PAVEMENT				
Note: Milling					
0049	1297000000-E	22100.000	SY	$1.0400	$22,984.00
	MILLING ASPHALT PAVEMENT, ***" DEPTH (2-1/2")				
Note: Milling					
0050	1297000000-E	1900.000	SY	$2.6000	$4,940.00
	MILLING ASPHALT PAVEMENT, ***" DEPTH (3")				
Note: Milling					
Section 0001 Total					$57,408.00
Item Total					$57,408.00

THIS PROPOSAL CONTAINS THE FOLLOWING ERRORS/WARNINGS (IF ANY)
HALL'S TREE SERVICE INC/DBE: 0004 Price is over committed.
LINEBERRY INC/DBE: 0172 Price is over committed.

This Bid contains 1 amendment files

1 09/05/2023 REMOVE 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 _____

Agency _____

Date _____

Signature _____

Agency _____

Date _____

Signature _____

Agency _____

Date _____

Attachments

Failure to complete and attach 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 included on the form. The contractor will not be permitted to change the option after the bids are submitted.

NOTE: The maximum upload limit is 5 MB. ☐ Verify

Contract Item Sheets For C204785

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
			ROADWAY ITEMS			
0001	0000100000-N	800	MOBILIZATION	LUMP SUM	2,422,000.00	2,422,000.00
0002	0000400000-N	801	CONSTRUCTION SURVEYING	LUMP SUM	1,500,000.00	1,500,000.00
0003	0001000000-E	200	CLEARING & GRUBBING .. ACRE(S)	LUMP SUM LS	3,000,000.00	3,000,000.00
0004	0008000000-E	200	SUPPLEMENTARY CLEARING & GRUBBING	1 ACR	5,000.00	5,000.00
0005	0022000000-E	225	UNCLASSIFIED EXCAVATION	118,000 CY	5.00	590,000.00
0006	0036000000-E	225	UNDERCUT EXCAVATION	37,500 CY	11.15	418,125.00
0007	0106000000-E	230	BORROW EXCAVATION	286,500 CY	5.00	1,432,500.00
0008	0134000000-E	240	DRAINAGE DITCH EXCAVATION	3,390 CY	9.30	31,527.00
0009	0141000000-E	240	BERM DITCH CONSTRUCTION	1,110 LF	6.60	7,326.00
0010	0156000000-E	250	REMOVAL OF EXISTING ASPHALT PAVEMENT	15,600 SY	7.40	115,440.00
0011	0177000000-E	250	BREAKING OF EXISTING ASPHALT PAVEMENT	3,300 SY	3.60	11,880.00
0012	0192000000-N	260	PROOF ROLLING	32 HR	125.00	4,000.00
0013	0194000000-E	265	SELECT GRANULAR MATERIAL, CLASS III	47,000 CY	15.00	705,000.00
0014	0196000000-E	270	GEOTEXTILE FOR SOIL STABILIZATION	57,500 SY	1.00	57,500.00
0015	0199000000-E	SP	TEMPORARY SHORING	4,300 SF	60.10	258,430.00
0016	0255000000-E	SP	GENERIC GRADING ITEM HAULING AND DISPOSAL OF PETROLEUM CONTAMINATED SOIL	100 TON	72.50	7,250.00
0017	0318000000-E	300	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES	3,150 TON	65.00	204,750.00
0018	0320000000-E	300	FOUNDATION CONDITIONING GEOTEXTILE	15,316 SY	2.90	44,416.40
0019	0335200000-E	305	15" DRAINAGE PIPE	2,132 LF	95.50	203,606.00
0020	0335300000-E	305	18" DRAINAGE PIPE	1,540 LF	78.80	121,352.00
0021	0335400000-E	305	24" DRAINAGE PIPE	1,068 LF	94.40	100,819.20
0022	0335500000-E	305	30" DRAINAGE PIPE	468 LF	120.60	56,440.80

Contract Item Sheets For C204785

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0023	0335600000-E	305	36" DRAINAGE PIPE	132 LF	162.10	21,397.20
0024	0335800000-E	305	48" DRAINAGE PIPE	148 LF	279.80	41,410.40
0025	0448000000-E	310	****" RC PIPE CULVERTS, CLASS IV (48")	428 LF	362.10	154,978.80
0026	0448000000-E	310	****" RC PIPE CULVERTS, CLASS IV (54")	348 LF	432.90	150,649.20
0027	0448000000-E	310	****" RC PIPE CULVERTS, CLASS IV (66")	168 LF	690.20	115,953.60
0028	0448200000-E	310	15" RC PIPE CULVERTS, CLASS IV	7,976 LF	77.60	618,937.60
0029	0448300000-E	310	18" RC PIPE CULVERTS, CLASS IV	1,312 LF	103.80	136,185.60
0030	0448400000-E	310	24" RC PIPE CULVERTS, CLASS IV	1,356 LF	123.10	166,923.60
0031	0448500000-E	310	30" RC PIPE CULVERTS, CLASS IV	1,368 LF	177.30	242,546.40
0032	0448600000-E	310	36" RC PIPE CULVERTS, CLASS IV	604 LF	213.20	128,772.80
0033	0448700000-E	310	42" RC PIPE CULVERTS, CLASS IV	156 LF	257.50	40,170.00
0034	0582000000-E	310	15" CS PIPE CULVERTS, 0.064" THICK	64 LF	80.70	5,164.80
0035	0588000000-E	310	18" CS PIPE CULVERTS, 0.064" THICK	16 LF	111.00	1,776.00
0036	0594000000-E	310	24" CS PIPE CULVERTS, 0.064" THICK	32 LF	95.80	3,065.60
0037	0636000000-E	310	**" CS PIPE ELBOWS, *****" THICK (15", 0.064")	4 EA	527.50	2,110.00
0038	0636000000-E	310	**" CS PIPE ELBOWS, *****" THICK (18", 0.064")	2 EA	560.50	1,121.00
0039	0636000000-E	310	**" CS PIPE ELBOWS, *****" THICK (24", 0.064")	2 EA	696.60	1,393.20
0040	0995000000-E	340	PIPE REMOVAL	2,127 LF	35.90	76,359.30
0041	0996000000-N	350	PIPE CLEAN OUT	1 EA	5,031.00	5,031.00
0042	1011000000-N	500	FINE GRADING	LUMP SUM	7,836,745.00	7,836,745.00
0043	1099500000-E	505	SHALLOW UNDERCUT	1,120 CY	7.80	8,736.00
0044	1099700000-E	505	CLASS IV SUBGRADE STABILIZATION	3,800 TON	31.50	119,700.00
0045	1111000000-E	SP	CLASS IV AGGREGATE STABILIZATION	250 TON	32.00	8,000.00

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0046	1121000000-E	520	AGGREGATE BASE COURSE	86,200 TON	35.05	3,021,310.00
0047	1220000000-E	545	INCIDENTAL STONE BASE	510 TON	100.00	51,000.00
0048	1275000000-E	600	PRIME COAT	478 GAL	25.00	11,950.00
0049	1297000000-E	607	MILLING ASPHALT PAVEMENT, ***" DEPTH (2-1/2")	22,100 SY	3.05	67,405.00
0050	1297000000-E	607	MILLING ASPHALT PAVEMENT, ***" DEPTH (3")	1,900 SY	6.50	12,350.00
0051	1330000000-E	607	INCIDENTAL MILLING	2,890 SY	12.50	36,125.00
0052	1491000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0C	9,340 TON	80.30	750,002.00
0053	1503000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C	48,420 TON	60.00	2,905,200.00
0054	1519000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	3,130 TON	96.28	301,356.40
0055	1523000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	35,630 TON	71.80	2,558,234.00
0056	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	5,055 TON	650.00	3,285,750.00
0057	1693000000-E	654	ASPHALT PLANT MIX, PAVEMENT REPAIR	1,120 TON	177.50	198,800.00
0058	2000000000-N	806	RIGHT-OF-WAY MARKERS	298 EA	450.00	134,100.00
0059	2020000000-N	806	CONTROL-OF-ACCESS MARKERS	64 EA	450.00	28,800.00
0060	2022000000-E	815	SUBDRAIN EXCAVATION	448 CY	30.00	13,440.00
0061	2026000000-E	815	GEOTEXTILE FOR SUBSURFACE DRAINS	2,000 SY	11.00	22,000.00
0062	2036000000-E	815	SUBDRAIN COARSE AGGREGATE	336 CY	70.00	23,520.00
0063	2044000000-E	815	6" PERFORATED SUBDRAIN PIPE	2,000 LF	16.00	32,000.00
0064	2070000000-N	815	SUBDRAIN PIPE OUTLET	4 EA	400.00	1,600.00
0065	2077000000-E	815	6" OUTLET PIPE	24 LF	40.00	960.00
0066	2209000000-E	838	ENDWALLS	33 CY	2,705.00	89,265.00
0067	2220000000-E	838	REINFORCED ENDWALLS	16.3 CY	1,790.00	29,177.00

Contract Item Sheets For C204785

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0068	2275000000-E	SP	FLOWABLE FILL	2.2 CY	3,844.00	8,456.80
0069	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	129 EA	5,136.00	662,544.00
0070	2297000000-E	840	MASONRY DRAINAGE STRUCTURES	25.2 CY	4,060.00	102,312.00
0071	2308000000-E	840	MASONRY DRAINAGE STRUCTURES	80 LF	226.00	18,080.00
0072	2354200000-N	840	FRAME WITH GRATE, STD 840.24	2 EA	1,245.00	2,490.00
0073	2364000000-N	840	FRAME WITH TWO GRATES, STD 840.16	23 EA	1,488.00	34,224.00
0074	2366000000-N	840	FRAME WITH TWO GRATES, STD 840.24	28 EA	1,410.00	39,480.00
0075	2367000000-N	840	FRAME WITH TWO GRATES, STD 840.29	57 EA	1,423.00	81,111.00
0076	2396000000-N	840	FRAME WITH COVER, STD 840.54	3 EA	1,274.00	3,822.00
0077	2407000000-N	840	STEEL FRAME WITH TWO GRATES, STD 840.37	22 EA	3,422.00	75,284.00
0078	2451000000-N	852	CONCRETE TRANSITIONAL SECTION FOR DROP INLET	102 EA	1,625.00	165,750.00
0079	2538000000-E	846	**'-**" CONCRETE CURB & GUTTER (2'-9")	11,230 LF	26.75	300,402.50
0080	2542000000-E	846	1'-6" CONCRETE CURB & GUTTER	18,960 LF	20.15	382,044.00
0081	2612000000-E	848	6" CONCRETE DRIVEWAY	1,380 SY	88.25	121,785.00
0082	2619000000-E	850	4" CONCRETE PAVED DITCH	70 SY	242.25	16,957.50
0083	2655000000-E	852	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)	9,010 SY	78.80	709,988.00
0084	3030000000-E	862	STEEL BEAM GUARDRAIL	1,200 LF	24.00	28,800.00
0085	3105000000-N	862	STEEL BEAM GUARDRAIL TERMINAL SECTIONS	14 EA	75.00	1,050.00
0086	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	10 EA	55.00	550.00
0087	3210000000-N	862	GUARDRAIL END UNITS, TYPE CAT-1	4 EA	975.00	3,900.00
0088	3287000000-N	SP	GUARDRAIL END UNITS, TYPE TL-3	4 EA	3,300.00	13,200.00
0089	3360000000-E	863	REMOVE EXISTING GUARDRAIL	860 LF	1.00	860.00
0090	3503000000-E	866	WOVEN WIRE FENCE, 47" FABRIC	24,410 LF	4.50	109,845.00

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0091	3509000000-E	866	4" TIMBER FENCE POSTS, 7'-6" LONG	1,529 EA	32.00	48,928.00
0092	3515000000-E	866	5" TIMBER FENCE POSTS, 8'-0" LONG	397 EA	38.00	15,086.00
0093	3564000000-E	866	SINGLE GATES, **" HIGH, **' WIDE, **' OPENING (47", 12', 12')	1 EA	2,500.00	2,500.00
0094	3628000000-E	876	RIP RAP, CLASS I	2,350 TON	61.90	145,465.00
0095	3635000000-E	876	RIP RAP, CLASS II	260 TON	64.30	16,718.00
0096	3649000000-E	876	RIP RAP, CLASS B	1,210 TON	61.90	74,899.00
0097	3656000000-E	876	GEOTEXTILE FOR DRAINAGE	8,270 SY	3.90	32,253.00
0098	4025000000-E	901	CONTRACTOR FURNISHED, TYPE *** SIGN (D)	486 SF	23.00	11,178.00
0099	4025000000-E	901	CONTRACTOR FURNISHED, TYPE *** SIGN (E)	840 SF	21.00	17,640.00
0100	4025000000-E	901	CONTRACTOR FURNISHED, TYPE *** SIGN (F)	11,915 SF	10.00	119,150.00
0101	4072000000-E	903	SUPPORTS, 3-LB STEEL U-CHANNEL	2,924 LF	7.49	21,900.76
0102	4096000000-N	904	SIGN ERECTION, TYPE D	2 EA	190.00	380.00
0103	4102000000-N	904	SIGN ERECTION, TYPE E	103 EA	80.00	8,240.00
0104	4108000000-N	904	SIGN ERECTION, TYPE F	43 EA	135.00	5,805.00
0105	4155000000-N	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	40 EA	4.50	180.00
0106	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	1,830 SF	7.65	13,999.50
0107	4405000000-E	1110	WORK ZONE SIGNS (PORTABLE)	1,100 SF	34.70	38,170.00
0108	4410000000-E	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	2,780 SF	16.40	45,592.00
0109	4415000000-N	1115	FLASHING ARROW BOARD	2 EA	8,393.00	16,786.00
0110	4420000000-N	1120	PORTABLE CHANGEABLE MESSAGE SIGN	4 EA	16,008.00	64,032.00
0111	4430000000-N	1130	DRUMS	2,820 EA	61.00	172,020.00

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0112	4445000000-E	1145	BARRICADES (TYPE III)	1,616 LF	37.90	61,246.40
0113	4455000000-N	1150	FLAGGER	1,620 DAY	200.00	324,000.00
0114	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	4 EA	11,250.00	45,000.00
0115	4470000000-N	1160	REMOVE & RESET TEMPORARY CRASH CUSHION	4 EA	2,950.00	11,800.00
0116	4480000000-N	1165	TMA	2 EA	34,753.00	69,506.00
0117	4490000000-E	1170	PORTABLE CONCRETE BARRIER (ANCHORED)	1,827 LF	59.90	109,437.30
0118	4505000000-E	1170	REMOVE & RESET PORTABLE CONCRETE BARRIER (ANCHORED)	1,596 LF	18.50	29,526.00
0119	4510000000-N	1190	LAW ENFORCEMENT	240 HR	78.00	18,720.00
0120	4650000000-N	1251	TEMPORARY RAISED PAVEMENT MARKERS	3,200 EA	11.35	36,320.00
0121	4685000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	110,473 LF	0.64	70,702.72
0122	4695000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)	14,830 LF	1.17	17,351.10
0123	4700000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)	1,089 LF	3.65	3,974.85
0124	4709000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (24", 90 MILS)	470 LF	18.00	8,460.00
0125	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	170 EA	120.00	20,400.00
0126	4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	386,140 LF	0.19	73,366.60
0127	4820000000-E	1205	PAINT PAVEMENT MARKING LINES (8")	19,310 LF	0.29	5,599.90
0128	4825000000-E	1205	PAINT PAVEMENT MARKING LINES (12")	610 LF	2.00	1,220.00
0129	4835000000-E	1205	PAINT PAVEMENT MARKING LINES (24")	1,110 LF	3.00	3,330.00
0130	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	140 EA	40.00	5,600.00
0131	4850000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (4")	5,000 LF	1.50	7,500.00
0132	4865000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (12")	500 LF	3.00	1,500.00
0133	4870000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (24")	500 LF	5.00	2,500.00
0134	4905100000-N	SP	NON-CAST IRON SNOWPLOWABLE PAVEMENT MARKER	1,562 EA	47.25	73,804.50

Contract Item Sheets For C204785

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0135	4955000000-N	1264	OBJECT MARKERS (END OF ROAD)	18 EA	85.00	1,530.00
0136	5325400000-E	1510	4" WATER LINE	834 LF	113.00	94,242.00
0137	5325600000-E	1510	6" WATER LINE	6,400 LF	82.00	524,800.00
0138	5325800000-E	1510	8" WATER LINE	6,475 LF	86.00	556,850.00
0140	5326600000-E	1510	16" WATER LINE	7,247 LF	218.00	1,579,846.00
0141	5329000000-E	1510	DUCTILE IRON WATER PIPE FITTINGS	42,250 LB	10.00	422,500.00
0142	5540000000-E	1515	6" VALVE	7 EA	3,000.00	21,000.00
0143	5546000000-E	1515	8" VALVE	7 EA	3,800.00	26,600.00
0144	5558600000-E	1515	16" VALVE	1 EA	15,000.00	15,000.00
0145	5589200000-E	1515	2" AIR RELEASE VALVE	3 EA	10,200.00	30,600.00
0146	5648000000-N	1515	RELOCATE WATER METER	40 EA	1,800.00	72,000.00
0147	5649000000-N	1515	RECONNECT WATER METER	2 EA	1,800.00	3,600.00
0148	5672000000-N	1515	RELOCATE FIRE HYDRANT	12 EA	10,000.00	120,000.00
0149	5673000000-E	1515	FIRE HYDRANT LEG	125 LF	70.00	8,750.00
0150	5686500000-E	1515	WATER SERVICE LINE	2,434 LF	38.00	92,492.00
0151	5798000000-E	1530	ABANDON **" UTILITY PIPE (4")	540 LF	10.00	5,400.00
0152	5800000000-E	1530	ABANDON 6" UTILITY PIPE	6,043 LF	12.00	72,516.00
0153	5801000000-E	1530	ABANDON 8" UTILITY PIPE	6,659 LF	16.00	106,544.00
0154	5810000000-E	1530	ABANDON 16" UTILITY PIPE	7,036 LF	26.00	182,936.00
0155	5835600000-E	1540	12" ENCASEMENT PIPE	849 LF	136.00	115,464.00
0156	5835700000-E	1540	16" ENCASEMENT PIPE	808 LF	216.00	174,528.00
0157	5836200000-E	1540	30" ENCASEMENT PIPE	494 LF	588.00	290,472.00
0158	5872500000-E	1550	BORE AND JACK OF **" (12")	448 LF	302.00	135,296.00

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0159	5872500000-E	1550	BORE AND JACK OF **" (16")	472 LF	464.00	219,008.00
0160	5872500000-E	1550	BORE AND JACK OF **" (30")	161 LF	770.00	123,970.00
0162	6000000000-E	1605	TEMPORARY SILT FENCE	106,450 LF	1.00	106,450.00
0163	6006000000-E	1610	STONE FOR EROSION CONTROL, CLASS A	1,460 TON	79.40	115,924.00
0164	6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	5,505 TON	30.00	165,150.00
0165	6012000000-E	1610	SEDIMENT CONTROL STONE	4,095 TON	30.00	122,850.00
0166	6015000000-E	1615	TEMPORARY MULCHING	296.5 ACR	1,275.00	378,037.50
0167	6018000000-E	1620	SEED FOR TEMPORARY SEEDING	14,200 LB	3.00	42,600.00
0168	6021000000-E	1620	FERTILIZER FOR TEMPORARY SEEDING	71.5 TON	900.00	64,350.00
0169	6024000000-E	1622	TEMPORARY SLOPE DRAINS	3,565 LF	33.00	117,645.00
0170	6029000000-E	SP	SAFETY FENCE	6,280 LF	1.85	11,618.00
0171	6030000000-E	1630	SILT EXCAVATION	12,110 CY	1.00	12,110.00
0172	6036000000-E	1631	MATTING FOR EROSION CONTROL	132,000 SY	1.00	132,000.00
0173	6037000000-E	SP	COIR FIBER MAT	100 SY	6.50	650.00
0174	6042000000-E	1632	1/4" HARDWARE CLOTH	4,400 LF	21.00	92,400.00
0175	6043000000-E	SP	LOW PERMEABILITY GEOTEXTILE	210 SY	5.10	1,071.00
0176	6045000000-E	SP	**" TEMPORARY PIPE (18")	40 LF	110.00	4,400.00
0177	6045000000-E	SP	**" TEMPORARY PIPE (48")	220 LF	131.50	28,930.00
0178	6046000000-E	1636	TEMPORARY PIPE FOR STREAM CROSSING	125 LF	97.80	12,225.00
0179	6070000000-N	1639	SPECIAL STILLING BASINS	22 EA	2,595.00	57,090.00
0180	6071012000-E	SP	COIR FIBER WATTLE	12,100 LF	5.00	60,500.00
0181	6071020000-E	SP	POLYACRYLAMIDE (PAM)	4,330 LB	1.00	4,330.00
0182	6071030000-E	1640	COIR FIBER BAFFLE	2,500 LF	9.50	23,750.00

Contract Item Sheets For C204785

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0183	6071050000-E	SP	**" SKIMMER (1-1/2")	7 EA	2,377.00	16,639.00
0184	6071050000-E	SP	**" SKIMMER (2")	3 EA	2,519.00	7,557.00
0185	6084000000-E	1660	SEEDING & MULCHING	250 ACR	2,850.00	712,500.00
0186	6087000000-E	1660	MOWING	192 ACR	200.00	38,400.00
0187	6090000000-E	1661	SEED FOR REPAIR SEEDING	3,000 LB	10.00	30,000.00
0188	6093000000-E	1661	FERTILIZER FOR REPAIR SEEDING	8.25 TON	1,500.00	12,375.00
0189	6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	5,075 LB	7.50	38,062.50
0190	6108000000-E	1665	FERTILIZER TOPDRESSING	152 TON	1,050.00	159,600.00
0191	6111000000-E	SP	IMPERVIOUS DIKE	185 LF	80.00	14,800.00
0192	6114500000-N	1667	SPECIALIZED HAND MOWING	10 MHR	125.00	1,250.00
0193	6114800000-N	SP	MANUAL LITTER REMOVAL	107 MHR	20.00	2,140.00
0194	6114900000-E	SP	LITTER DISPOSAL	7 TON	300.00	2,100.00
0195	6117000000-N	SP	RESPONSE FOR EROSION CONTROL	100 EA	300.00	30,000.00
0196	6117500000-N	SP	CONCRETE WASHOUT STRUCTURE	8 EA	2,266.00	18,128.00
0197	6120000000-E	SP	CULVERT DIVERSION CHANNEL	730 CY	25.00	18,250.00
0198	7060000000-E	1705	SIGNAL CABLE	1,925 LF	3.28	6,314.00
0199	7120000000-E	1705	VEHICLE SIGNAL HEAD (12", 3 SECTION)	17 EA	1,200.00	20,400.00
0200	7132000000-E	1705	VEHICLE SIGNAL HEAD (12", 4 SECTION)	4 EA	1,400.00	5,600.00
0201	7279000000-E	1715	TRACER WIRE	1,425 LF	2.00	2,850.00
0202	7300000000-E	1715	UNPAVED TRENCHING (**********) (2, 2")	2,800 LF	15.00	42,000.00
0203	7301000000-E	1715	DIRECTIONAL DRILL (**********) (2, 2")	800 LF	30.00	24,000.00
0204	7312000000-N	1716	JUNCTION BOX (**********) (SPECIAL OVERSIZED, HEAVY DUTY)	2 EA	1,800.00	3,600.00
0205	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	16 EA	750.00	12,000.00

Contract Item Sheets For C204785

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
0206	7348000000-N	1716	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)	6 EA	1,400.00	8,400.00
0207	7444000000-E	1725	INDUCTIVE LOOP SAWCUT	1,600 LF	13.00	20,800.00
0208	7456000000-E	1726	LEAD-IN CABLE (**********) (14-2)	4,325 LF	2.00	8,650.00
0209	7516000000-E	1730	COMMUNICATIONS CABLE (** FIBER) (12)	575 LF	7.00	4,025.00
0210	7516000000-E	1730	COMMUNICATIONS CABLE (** FIBER) (24)	1,275 LF	8.00	10,200.00
0211	7540000000-N	1731	SPLICE ENCLOSURE	2 EA	2,500.00	5,000.00
0212	7552000000-N	1731	INTERCONNECT CENTER	3 EA	2,000.00	6,000.00
0213	7566000000-N	1733	DELINEATOR MARKER	5 EA	185.00	925.00
0214	7588000000-N	SP	METAL POLE WITH SINGLE MAST ARM	3 EA	36,000.00	108,000.00
0215	7613000000-N	SP	SOIL TEST	3 EA	3,000.00	9,000.00
0216	7614100000-E	SP	DRILLED PIER FOUNDATION	16.5 CY	2,000.00	33,000.00
0217	7631000000-N	SP	MAST ARM WITH METAL POLE DESIGN	3 EA	200.00	600.00
0218	7636000000-N	1745	SIGN FOR SIGNALS	5 EA	600.00	3,000.00
0219	7642200000-N	1743	TYPE II PEDESTAL WITH FOUNDATION	7 EA	3,000.00	21,000.00
0220	7684000000-N	1750	SIGNAL CABINET FOUNDATION	3 EA	3,200.00	9,600.00
0221	7696000000-N	1751	CONTROLLERS WITH CABINET (**********) (TYPE 2070LX, BASE MOUNTED)	3 EA	22,500.00	67,500.00
0222	7744000000-N	1751	DETECTOR CARD (TYPE 170)	10 EA	200.00	2,000.00
0223	7901000000-N	1753	CABINET BASE EXTENDER	3 EA	800.00	2,400.00
0224	7980000000-N	SP	GENERIC SIGNAL ITEM DIGITAL CCTV CAMERA ASSEMBLY	1 EA	6,500.00	6,500.00
0225	7980000000-N	SP	GENERIC SIGNAL ITEM ETHERNET EDGE SWITCH	3 EA	4,500.00	13,500.00

Contract Item Sheets For C204785

Line #	ItemNumber	Sec #	Description	Quantity Unit	Unit Bid Price	Amount Bid
			CULVERT ITEMS			
0226	8126000000-N	414	CULVERT EXCAVATION, STA ****** (181+58.77 -L-)	LUMP SUM	54,500.00	54,500.00
0227	8126000000-N	414	CULVERT EXCAVATION, STA ****** (198+61.03 -L-)	LUMP SUM	57,500.00	57,500.00
0228	8126000000-N	414	CULVERT EXCAVATION, STA ****** (24+46.00 -L-)	LUMP SUM	92,500.00	92,500.00
0229	8133000000-E	414	FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	339 TON	75.00	25,425.00
0230	8140000000-E	416	CHANNEL EXCAVATION	1,065 CY	35.00	37,275.00
0231	8196000000-E	420	CLASS A CONCRETE (CULVERT)	484.6 CY	875.00	424,025.00
0232	8245000000-E	425	REINFORCING STEEL (CULVERT)	56,826 LB	2.25	127,858.50
				TOTAL AMOUNT OF BID FOR ENTIRE PROJECT		$48,441,330.83

1033/Oct02/Q1982812.05/D935692362000/E230

Contract No. C204785

County Harnett

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 bona fide 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

Barnhill Contracting Company

Full name of Corporation

PO Box 7948 Rocky Mount, NC 27804

Address as Prequalified

Attest Gwendolyn F Hinnant By Chris Stroud V-P

~~Secretary~~/Assistant Secretary — ~~President~~/Vice President/~~Assistant Vice President~~

Select appropriate title — *Select appropriate title*

Gwendolyn F Hinnant — Chris Stroud

Print or type Signer's name — Print or type Signer's name

CORPORATE SEAL

BARNHILL CONTRACTING COMPANY CORPORATE SEAL 1949 N.C.

Contract No. C204785
County Harnett

Rev. 1-16-18

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.

Contract No. C204785

County Harnett

Rev. 1-16-18

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.

☐ Check here if an explanation is attached to this certification.

Contract No. **C204785**

County (ies): **Harnett**

ACCEPTED BY THE
DEPARTMENT OF TRANSPORTATION

DocuSigned by:
Ronald E. Davenport, Jr.
F81B6038A47A442...
Contract Officer

10/11/2023
Date

Execution of Contract and Bonds
Approved as to Form:

DocuSigned by:
Joseph Stanford
6A6B013C83DE47D...
Attorney General

10/11/2023
Date

Contract No. C204785
County Harnett

Rev. 11-1-12

Bond No. 107897106

North Carolina Department of Transportation

CONTRACT PAYMENT BOND

Date of Payment Bond Execution	October 4, 2023
Name of Principal Contractor	Barnhill Contracting Company
Name of Surety:	Travelers Casualty and Surety Company of America
Name of Contracting Body:	North Carolina Department of Transportation
	1020 Birch Ridge Drive, Raleigh, NC 27610
Amount of Bond:	Forty Eight Million Four Hundred Forty One Thousand Three Hundred Thirty Dollars and 83/100 $48,441,330.83
Contract ID No.:	C204785
County Name:	Harnett

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 No. C204785
County Harnett

Rev. 11-1-12

CONTRACT PAYMENT BOND

Affix Seal of Surety Company

Travelers Casualty and Surety Company of America
Print or type Surety Company Name

By Michelle A. Adams, Attorney-in-Fact
Print, stamp or type name of Attorney-in-Fact

Signature of Attorney-in-Fact

Signature of Witness

Lynn Locklear-Fisher
Print or type Signer's name

6100 Fairview Rd.
Charlotte, NC 28210
Address of Attorney-in-Fact

Contract No. C204785
County Harnett

Rev. 11-1-12

CONTRACT PAYMENT BOND

CORPORATION

SIGNATURE OF CONTRACTOR (Principal)

Barnhill Contracting Company
Full name of Corporation

P.O. Box 7948, Rocy Mount, NC 27804
Address as prequalified

By Chris Stroud Vice-Pres
Signature of ~~President~~, Vice President, ~~Assistant Vice President~~
Select appropriate title

Chris Stroud
Print or type Signer's name

Affix Corporate Seal

BARNHILL CONTRACTING COMPANY
CORPORATE SEAL
1949
N.C.

Attest Gwendolyn F Hinnant
Signature of ~~Secretary~~, Assistant Secretary
Select appropriate title

Gwendolyn F Hinnant
Print or type Signer's name

Contract No. C204785
County Harnett

Rev. 11-1-12

Bond No. 107897106

North Carolina Department of Transportation

CONTRACT PERFORMANCE BOND

Date of Performance Bond Execution:	October 4, 2023
Name of Principal Contractor:	Barnhill Contracting Company
Name of Surety:	Travelers Casualty and Surety Company of America
Name of Contracting Body:	North Carolina Department of Transportation
	1020 Birch Ridge Drive, Raleigh, NC 27610
Amount of Bond:	Forty Eight Million Four Hundred Forty One Thousand Three Hundred Thirty Dollars and 83/100 $48,441,330.83
Contract ID No.:	C204785
County Name:	Harnett

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.

Contract No. C204785
County Harnett

Rev. 11-1-12

CONTRACT PERFORMANCE BOND

Affix Seal of Surety Company

Travelers Casualty and Surety Company of America
Print or type Surety Company Name

By Michelle A. Adams, Attorney-in-Fact
Print, stamp or type name of Attorney-in-Fact

Signature of Attorney-in-Fact

Signature of Witness

Lynn Locklear-Fisher
Print or type Signer's name

6100 Fairview Rd.
Charlotte, NC 28210
Address of Attorney-in-Fact

Contract No. C204785
County Harnett

Rev. 11-1-12

CONTRACT PERFORMANCE BOND

CORPORATION

SIGNATURE OF CONTRACTOR (Principal)

Barnhill Contracting Company
Full name of Corporation

P.O. Box 7948, Rocy Mount, NC 27804
Address as prequalified

By Chris Stroud Vice-Pres.
Signature of ~~President,~~ Vice President, ~~Assistant Vice President~~
Select appropriate title

Chris Stroud
Print or type Signer's name

Affix Corporate Seal

BARNHILL CONTRACTING COMPANY
CORPORATE
SEAL
1949
N.C.

Attest Gwendolyn F Hinnant
Signature of ~~Secretary,~~ Assistant Secretary
Select appropriate title

Gwendolyn F Hinnant
Print or type Signer's name

TRAVELERS	Travelers Casualty and Surety Company of America Travelers Casualty and Surety Company St. Paul Fire and Marine Insurance Company Farmington Casualty Company

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, St. Paul Fire and Marine Insurance Company, and Farmington Casualty Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint Michelle A. Adams of Charlotte, NC, their true and lawful Attorney(s)-in-Fact to sign, execute, seal and acknowledge the following bond.

Surety Bond No.: 107897106
OR
Project Description: C204785; Harnett County; NC-55 from South of SR-1532 (Oak Grove Church Rd) to NC-210; Grading, Drainage, Paving, Signals, and Culverts

Principal: Barnhill Contracting Company
Obligee: North Carolina Department of Transportation

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this **21st** day of **April, 2021.**

State of Connecticut

City of Hartford ss.

By: _____
Robert L. Raney, Senior Vice President

On this the **21st** day of **April, 2021**, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of each of the Companies, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of said Companies by himself as a duly authorized officer.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My Commission expires the **30th** day of **June, 2026**

_____
Anna P. Nowik, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of each of the Companies, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of each of the Companies, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this 4th day of October, 2023.

_____
Kevin E. Hughes, Assistant Secretary

To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.
Please refer to the above-named Attorney(s)-in-Fact and the details of the bond to which this Power of Attorney is attached.