Transportation

PAT McCRORY
Governor

NICHOLAS J. TENNYSON
Secretary

September 8, 2016

Addendum No. 1
RE: Contract # C203792
WBS # 34820.3.30
F. A. # NHF-0708(53)
Guilford County (U-2524D)
Greensboro Western Loop – From US-220 (Battleground Avenue)
To SR-2303 (Lawndale Drive)

September 20, 2016 Letting

To Whom It May Concern:

Reference is made to the plans and proposal form furnished to you on this project.

The following revision has been made to the Roadway plans:

Sheet No.	Revisions
UC-3A	Revised to require 5 ft. diameter manholes

Please void Sheet No. UC-3A in your plans and staple the revised Sheet No. UC-3A thereto.

The following revisions have been made to the Structure (Culvert) plans:

Sheet No.	Revisions
Summary of Construction Sheet	Added North Arrow
C-1	Added Control line reference on profile along centerline of Culvert
C-2	Added reference at top right "See Plan of Culvert #2 and Section D-D on Sheet C-8 For Details"
C-7	Eliminated note about backfilling the culvert depth to depth of 1 foot, etc.
C-8	Corrected orientation of -Y8- line relative to culvert centerline
C-14	Corrected profile along centerline of Culvert to reflect existing ground profile; added control line reference on Profile Along Centerline of culvert; added note for culvert falsework/formwork submittal requirements; added note for construction of pipes through culvert sidewalls
C-15	Changed construction joint to "Permitted" construction joint in Section along centerline of culvert; in Section A-A changed construction joint to

State of North Carolina | Department of Transportation | Contract Standards and Development
1020 Birch Ridge Dr. | 1591 Mail Service Center | Raleigh, NC 27699-1591
919-707-6900 T

Sheet No.	Revisions
	"Permitted" construction joint at top of wall; corrected dimensions on Outlet End Elevation; corrected note for misc. items quantity at bottom of page near center
C-16	Corrected total culvert width dimension at downstream end of Plan – Floor Slab
C-17	Corrected text size on Coping Height dimension in Elevation view of Retaining Wall #18
C-23	Corrected profile along centerline of culvert to reflect existing ground profile; added control line reference on Profile Along Centerline of Culvert; added note to address construction of pipes through culvert sidewalls
C-24	Added headwall height dimension on Culvert Section Normal to Roadway; corrected dimension on Inlet End Elevation Normal To Skew
C-25	Corrected "blank" dimension (along skew) on upstream end of Plan Of Roof Slab; corrected number of corner bars (A1/A2) in Plan View (Roof/Floor)
C-26	Added break line on Elevation of Wing W2; corrected "blank" vertical dimensions for sloped part of both wings; flipped Wing Views to reflect proper skew orientations
C-30	Added Culvert ID Station on Plan of Roof Slab and Plan of Floor Slab

Please void the above listed sheets in your plans and staple the revised sheets thereto.

The following revisions have been made to the proposal:

Page No.	Revisions
Proposal Cover	Note added that reads "Includes Addendum No. 1 Dated 09-08-16"
Table of Contents	Revised to reflect the below noted project special provision being removed
G-6	Revised the line # for Soil Nail Retaining Walls within the project special provision entitled "Major Contract Items" and added new utility items to the list of "Specialty Items' to reflect the below noted pay item changes
G-40	Revised to remove the project special provision entitled "Note To Contractor Regarding Construction Of Noise Walls". The permit modification has been received as noted below. Page G-40 is no longer needed and has been eliminated
New P-38 Thru P-55	Added Permit Modification to cover work Sites 11 and 12

Please void the above listed existing pages in your proposal and replace with the revised pages. Please add the new pages after the appropriate last existing page.

On the item sheets the following pay item quantity changes have been made:

Item	Description	Old Quantity	New Quantity
214-5775000000-E-1525	4' Dia Utility Manhole	51 EA	43 EA
215-5781000000-E-1525	Utility Manhole Wall, 4' Dia	455 LF	370 LF
401-5776000000-E-1525	5' Dia Utility Manhole	**NEW ITEM**	8 EA
402-5782000000-E-1525	Utility Manhole Wall, 5' Dia	**NEW ITEM**	93 LF
358-8802010000-E-SP	Soil Nail Retaining Walls	74,545 SF	**DELETED (to become part of Alternate 1A**
359-8802015100-N-SP	Soil Nail Verification Tests	19 EA	**DELETED (to become part of Alternate 1A**
360-8802015110-N-SP	Soil Nail Proof Tests	127 EA	**DELETED (to become part of Alternate 1A**
367-8802010000-E-SP	Soil Nail Retaining Walls	5,930 SF	80,475 SF
368- 8802015100-N-SP	Soil Nail Verification Tests	**NEW ITEM**	19 EA
369-8802015110-N-SP	Soil Nail Proof Tests	**NEW ITEM**	127 EA
372-8802010000-E-SP	Soil Nail Retaining Walls	**NEW ITEM**	74,545 LF
373- 8802015100-N-SP	Soil Nail Verification Tests	**NEW ITEM**	15 EA
374-8802015110-N-SP	Soil Nail Proof Tests	**NEW ITEM**	115 EA

Changes to Soil Nail Retaining Walls and Tests pay items where necessary to correct bid alternate Schedule 1A. The Contractor's bid must include these pay item quantity changes and new pay items. The contract will be prepared accordingly.

The Expedite File has been updated to reflect these revisions. Please download the Expedite Addendum File and follow the instructions for applying the addendum. Bid Express will not accept your bid unless the addendum has been applied.

Sincerely,

R. A. Garris, PE
Contract Officer

RAG/jag

cc: Mr. Lamar Sylvester, PE
Mr. Mike Mills, PE
Mr. Rodger Rochelle, PE
Mr. R.E. Davenport, PE
Mr. Ken Kennedy, PE
Ms. Jaci Kincaid
Project File (2)
Mr. Ray Arnold, PE
Ms. Theresa Canales, PE
Ms. Marsha Sample
Mr. Mike Gwyn
Mr. Mitchell Dixon
Ms. Penny Higgins
Ms. Lori Strickland

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

PROPOSAL

INCLUDES ADDENDUM No.1 DATED 09-08-16

DATE AND TIME OF BID OPENING: **SEPTEMBER 20, 2016 AT 2:00 PM**

CONTRACT ID	C203792
WBS	34820.3.30

FEDERAL-AID NO.	NHF-0708(53)
COUNTY	GUILFORD
T.I.P. NO.	U-2524D
MILES	1.873
ROUTE NO.	
LOCATION	GREENSBORO WESTERN LOOP - FROM US-220 (BATTLEGROUND AVENUE) TO SR-2303 (LAWNDALE DRIVE).
TYPE OF WORK	GRADING, DRAINAGE, PAVING, ITS, SIGNALS & STRUCTURES.

NOTICE:

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

BIDS WILL BE RECEIVED AS SHOWN BELOW:

THIS IS A <u>ROADWAY & STRUCTURE</u> PROPOSAL

5% BID BOND OR BID DEPOSIT REQUIRED

TABLE OF CONTENTS

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
040A Z	Terrace Mews Associates	9-1-16
058	Liberty Square	10-15-16
109A	330 NW 71ST St. LC	9-1-16

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 *2012 Standard Specifications*):

Line #		Description
5	—	Unclassified Excavation
73	—	10-1/2" Port Cem Conc Pavement, Through Lanes(w/ Dowels)
372	—	Soil Nail Retaining Walls

SPECIALTY ITEMS:
(7-1-95)(Rev. 1-17-12) 108-6 SP1 G37

Items listed below will be the specialty items for this contract (see Article 108-6 of the *2012 Standard Specifications*).

Line #	Description
120 thru 130	Guardrail
132 thru 140	Fencing
145 thru 170	Signing
186 thru 189, 194 thru 197	Long-Life Pavement Markings
202 thru 203	Permanent Pavement Markers
204 thru 230, 401 thru 402	Utility Construction
231 thru 269	Erosion Control
270 thru 345	Signals/ITS System

FUEL PRICE ADJUSTMENT:
(11-15-05) (Rev. 2-18-14) 109-8 SP1 G43

Revise the *2012 Standard Specifications* as follows:

Page 1-83, Article 109-8, Fuel Price Adjustments, add the following:

The base index price for DIESEL #2 FUEL is **$ 1.5593** per gallon. Where any of the following are included as pay items in the contract, they will be eligible for fuel price adjustment.

PROJECT SPECIAL PROVISION

(10-18-95) (Rev. 10-15-13) Z-1

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, NCDEQ State of North Carolina

The Contractor shall comply with all applicable permit conditions during construction of this project. Those conditions marked by * are the responsibility of the Department and the Contractor has no responsibility in accomplishing those conditions.

Agents of the permitting authority will periodically inspect the project for adherence to the permits.

The Contractor's attention is also directed to Articles 107-10 and 107-13 of the *2012 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 waters or wetlands provided that activities outside those areas is done in such a manner as to not affect the waters or wetlands.

NOTE: This permit modification only applies to work Sites 11 – 12.

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

August 11, 2016

Regulatory Division/1200A

Action ID: SAW-2005-21386

Mr. Philip S. Harris III, P.E., C.P.M.
Natural Environment Section Head
North Carolina Department of Transportation
Division of Highways
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Harris:

Reference the Department of the Army (DA) permit issued on April 15, 2014, to Ms. Deborah Barbour of the North Carolina Department of Transportation, for impacts associated with the project identified as U-2525BC. The project is a 9.7 mile, four-lane/six-lane divided facility on new location extending from the US 70 relocation to SR 2303 (Lawndale Drive) in Greensboro, Guilford County, North Carolina. Section B of this project begins at the US 70 relocation and terminates at US 29, and Section C begins at US 29 and ends at SR 2303 (Lawndale Drive). Coordinates (in decimal degrees) for the site are: 36.089772° North, -79.697302° West for the eastern terminus and 36.141773° North, -79.825120° West for the western terminus. The site contains portions of four (4) unnamed tributaries to South Buffalo Creek, twenty (20) unnamed tributaries to North Buffalo Creek, five (5) unnamed tributaries to an unnamed tributary at Camp Herman, fourteen (14) unnamed tributaries to Reedy Fork, a portion of Richland Creek, and ten (10) unnamed tributaries to Richland Creek, as well as 50 (50) adjacent wetland areas and five (5) open water ponds in the Cape Fear River Basin (8-Digit Cataloging Unit 03030002).

Impacts authorized by the permit as well as subsequent permit modifications dated June 18, 2014, October 31, 2014, December 4, 2014, March 12, 2015, July 24, 2015, and March, 18, 2016 include: 1) The permanent placement of fill material into 23,467 linear feet of jurisdictional stream channel, 9.95 acres of adjacent riparian wetlands, and 2.32 acres of jurisdictional open waters and, 2) the temporary placement of fill material into 785 linear feet of jurisdictional stream channel and 0.31 acre of adjacent riparian wetlands associated with construction access and the relocation of utility lines. Compensatory mitigation was implemented for the unavoidable impacts by payment into the North Carolina Ecosystem Enhancement Program, now known as the North Carolina Division of Mitigation Services (NCDMS), as well as permittee responsible mitigation referenced in the permit special conditions.

Also reference your "Request for Modification..." letter dated August 8, 2016 (received August 10, 2016), proposing the following:

1) Release of Permit Sites 11 and12 of TIP U-2525C for construction per Special Condition 2 of the DA permit issued on April 15, 2014;

2) Authorization of a permanent discharge of fill material into 308 linear feet of stream channel related to:
   a. Placing 284 linear feet of stream channel in culverts and other fills resulting in permanent loss of waters, and;
   b. Adding rip rap bank stabilization to 24 linear feet of stream channel;

3) Authorization of a temporary discharge of fill material into 15 linear feet (0.01 acre) of stream channel related to temporary construction access and dewatering;

4) Authorization of a permanent discharge of fill material into 0.08 acre of riparian, non-riverine wetlands related to:
   a. Placing fill for road slopes into 0.05 acre of wetlands resulting in permanent loss of waters, and;
   b. Mechanized clearing in 0.03 acre of wetlands for installation and maintenance of sediment and erosion control devices.

Following evaluation of the information submitted in your modification request, the U.S. Army Corps of Engineers, Wilmington District has determined that it is appropriate and reasonable, is not contrary to the public interest, and no public notice is required for this modification. Therefore, the permit is modified to release Permit Sites 11 and12 of TIP U-2525C for construction, as described in the Wetland & Stream Impacts drawings for U-2525C (Permit Drawings Sheets 2-8) submitted in the "Request for Modification ..." letter dated August 8, 2016.

In addition, the following special condition regarding additional compensatory mitigation has been incorporated:

x) PHASED PERMIT: This permit modification only authorizes work on Permit Sites 11 and 12 of Section C of TIP U-2525. Construction on the remaining Permit Sites of Sections C of TIP U-2525 shall not commence until final design has been completed for these Sites, the permittee has minimized impacts to waters and wetlands to the maximum extent practicable, any modifications to the plans, and a compensatory mitigation plan, have been approved by the US Army Corps of Engineers. Preliminary plans for U-2525C were provided with the August 28, 2013 application (sheets 1-89) however, these plans are not to be used for construction purposes.

Since impacts to waters of the US for U-2525C were originally permitted as a conceptual sum, refinement of impacts to Sites 11 and 12 cannot be used to further update the total impact amount for the entire U-2525BC project. Rather, upon evaluation of a future modification request to release the remainder of U-2525C for construction, the impacts authorized by this modification will be added to the total proposed impacts for the entirety of the C section and compared with the originally permitted conceptual impact sum. Similarly, the original permit required compensatory mitigation for all of U-2525BC, including the use of the conceptual sum of stream and wetland impacts. This modification, concerning only Permit Sites 11 and 12, takes into account a compensatory mitigation requirement for losses of waters of the US, including 284 linear feet of stream and 0.08 acre of wetlands, via purchase of appropriate stream and wetland credits from NCDMS at a 2:1 mitigation to impact ratio. Since the above compensatory mitigation requirement falls below the amount of compensatory mitigation required in the original permit, any future change in the compensatory mitigation requirement will be based on the wetland and stream impacts proposed in the future modification request to release the remainder of U-2525C for construction.

All other conditions of the permit and subsequent modifications, including the permit expiration date of December 31, 2019, remain in effect as written. Should you have questions, contact Mr. David E. Bailey, Raleigh Regulatory Field Office at telephone (919) 554-4884, Extension 30 or David.E.Bailey2@usace.army.mil.

Sincerely,

for Kevin P. Landers
Colonel, U.S. Army
District Commander

Copies Furnished with Attachment:

Mr. Brian Wrenn
Transportation Permitting Unit
Division of Water Resources
North Carolina Department of
Environment and Natural Resources
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

Ms. Erin Cheely
North Carolina Department of Transportation
Division of Highways
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Mr. Jerry Parker
Division Environmental Supervisor, Division 7
North Carolina Department of Transportation
Post Office Box 14996
Greensboro, North Carolina 27415

Copies Furnished without Attachment:

Mr. Rodger Rochelle, P.E.
Technical Services Administrator
North Carolina Department of Transportation
1516 Mail Service Center
Raleigh, North Carolina 27699-1516

U.S. Fish and Wildlife Services
Fish and Wildlife Enhancement
Post Office Box 33726
Raleigh, North Carolina 28516

Ms. Cynthia Van Der Wiele
U.S. Environmental Protection Agency
Region 4 NEPA Program Office
c/o USEPA-RTP
109 T.W. Alexander Drive
Mail Code: E143-08
Research Triangle Park, North Carolina 27709

Mr. Travis Wilson
North Carolina Wildlife Resources Commission
1718 Hwy 56 West
Creedmoor, North Carolina 27522

Water Resources
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

S. JAY ZIMMERMAN
Director

August 12, 2016

Mr. Philip S. Harris, III, P.E., CPM
Natural Environment Section Head
Project Development and Environmental Analysis
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina, 27699-1598

Subject: Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS for the proposed Greensboro Eastern Loop from US 70 Relocation to SR 2303 (Lawndale Drive) in Guilford County, Division 7; WBS Element 34821.1.1, TIP Project Nos. U-2525 B and C.
NCDWR Project No. 20130918 v.8

Dear Mr. Harris:

Attached hereto is a modification of Certification No. 3978 issued to The North Carolina Department of Transportation (NCDOT) dated February 6, 2014 and subsequent modifications dated June 24, 2014, October 15, 2014, December 11, 2014, March 18, 2015, July 21, 2015, and March 18, 2016.

If we can be of further assistance, do not hesitate to contact us.

Sincerely,

S. Jay Zimmerman, Director
Division of Water Resources

Attachments

Electronic copy only distribution:
David Bailey, US Army Corps of Engineers, Raleigh Field Office
Jerry Parker, Division 7 Environmental Officer
Rodger Rochelle, NC Department of Transportation
Erin Cheely, NC Department of Transportation
Dr. Cynthia Van Der Wiele, US Environmental Protection Agency
Gary Jordan, US Fish and Wildlife Service
Travis Wilson, NC Wildlife Resources Commission
Beth Harmon, Division of Mitigation Services
File Copy

Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Resources (NCDWR) Regulations in 15 NCAC 2H .0500. This certification authorizes the NCDOT to impact an additional 0.08 acres of jurisdictional wetlands and 323 linear feet of jurisdictional streams in Guilford County. The project shall be constructed pursuant to the application dated received August 8, 2016. The authorized impacts are as described below:

Table 1. Stream Impacts in the Cape Fear River Basin

Site Number	Permanent Fill in Intermittent Stream (linear ft)	Temporary Fill in Intermittent Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)	Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
12	--	--	308	15	323	308
Total Original Impacts	--	--	**12,646**	--	--	**12,646**
Total Additional Impacts	--	--	**308**	**15**	**323**	**308**
Total Impacts	--	--	**12,954**	**15**	**12,969**	**12,954**

Total Stream Impact for U-2525C: 12,969 linear feet.

Table 2. Riverine Wetland Impacts in the Cape Fear River Basin

Site	Fill (ac)	Fill (temporary) (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Area under Bridge (ac)	Total Wetland Impact (ac)
11	0.05	--	--	0.03	--	--	0.08
Total Original Impacts	**2.4**	--	--	--	--	--	**2.4**
Total Additional Impacts	**0.05**	--	--	**0.03**	--	--	**0.08**
Total Impacts	**2.45**	--	--	**0.03**	--	--	**2.48**

Total Wetland Impact for U-2525C: 2.48 acres.

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 August 8, 2016. 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 150 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Condition(s) of Certification:

Project Specific Conditions

1. This modification is applicable only to the additional proposed activities. All of the authorized activities and conditions of certification associated with the original Water Quality Certification dated February 6, 2014 and subsequent modifications dated June 24, 2014, October 15, 2014, December 11, 2014, March 18, 2015, July 21, 2015, and March 18, 2016 still apply except where superseded by this certification.
2. When final design plans are completed for U-2525C, a modification to the 401 Water Quality Certification shall be submitted with five copies and fees to the NC Division of Water Resources. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, and other surface waters, and buffers. No construction activities that impact any wetlands, streams, surface waters, or buffers located in U-2525C shall begin until after the permittee applies for, and receives a written modification of the 401 Water Quality Certification from the NC Division of Water Resources.

General Conditions

1. Unless otherwise approved in this certification, placement of culverts and other structures in open waters and streams shall be placed below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and downstream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by NCDWR. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact NCDWR for guidance on how to proceed and to determine whether or not a permit modification will be required. [15A NCAC 02H.0506(b)(2)]
2. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills. [15A NCAC 02B.0200]
3. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers. [15A NCAC 02H.0506(b)(2)]
4. The dimension, pattern and profile of the stream above and below the crossing shall not be modified. Disturbed floodplains and streams shall be restored to natural geomorphic conditions. [15A NCAC 02H.0506(b)(2)]
5. The use of rip-rap above the Normal High Water Mark shall be minimized. Any rip-rap placed for stream stabilization shall be placed in stream channels in such a manner that it does not impede aquatic life passage. [15A NCAC 02H.0506(b)(2)]
6. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval. [15A NCAC 02H .0507 (c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]
7. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water. [15A NCAC 02H.0506(b)(3) and (c)(3)]
8. Heavy equipment shall be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the introduction of other pollutants into the stream. [15A NCAC 02H.0506(b)(3)]
9. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials. [15A NCAC 02H.0506(b)(3)]
10. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification. [15A NCAC 02H.0506(b)(3)]
11. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited. [15A NCAC 02H.0506(b)(3)]
12. 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]

13. 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)]
14. 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)]
15. 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]
16. 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.
17. 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)]
18. 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)]
19. 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)]
20. 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)]
21. 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.

22. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification. [15A NCAC 02H.0506(b)(3) and (c)(3)]
23. Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. This Certification shall become null and void unless the above conditions are made conditions of the Federal 404 and/or Coastal Area Management Act Permit. This Certification shall expire upon the expiration of the 404 or CAMA permit.

If you wish to contest any statement in the attached Certification you must file a petition for an administrative hearing. You may obtain the petition form from the office of Administrative hearings. You must file the petition with the

office of Administrative Hearings within sixty (60) days of receipt of this notice. A petition is considered filed when it is received in the office of Administrative Hearings during normal office hours. The Office of Administrative Hearings accepts filings Monday through Friday between the hours of 8:00am and 5:00pm, except for official state holidays. The original and one (1) copy of the petition must be filed with the Office of Administrative Hearings.

The petition may be faxed-provided the original and one copy of the document is received by the Office of Administrative Hearings within five (5) business days following the faxed transmission.
The mailing address for the Office of Administrative Hearings is:

Office of Administrative Hearings
6714 Mail Service Center
Raleigh, NC 27699-6714
Telephone: (919) 431-3000, Facsimile: (919) 431-3100

A copy of the petition must also be served on DEQ as follows:

Mr. Sam M. Hayes, General Counsel
Department of Environmental Quality
1601 Mail Service Center

This the 12th day of August 2016
DIVISION OF WATER RESOURCES

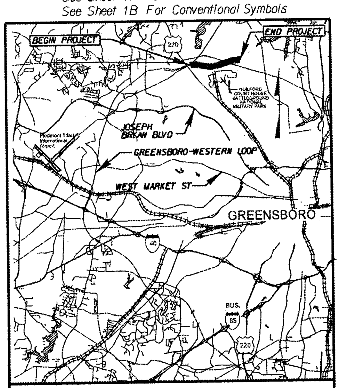
S. Jay Zimmerman, Director

WQC No. 3978

TIP PROJECT:

CONTRACT:

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS

U-2525C Modification Drawings
Greensboro Eastern Loop from US 29 north of Greensboro to SR 2303 (Lawndale Drive)
34821.1.1

PERMIT DRAWINGS
SHEET 1 OF 8

TYPE OF WORK: GRADING, PAVING, CULVERTS, DRAINAGE, STRUCTURES AND ITS

WETLAND & STREAM IMPACTS

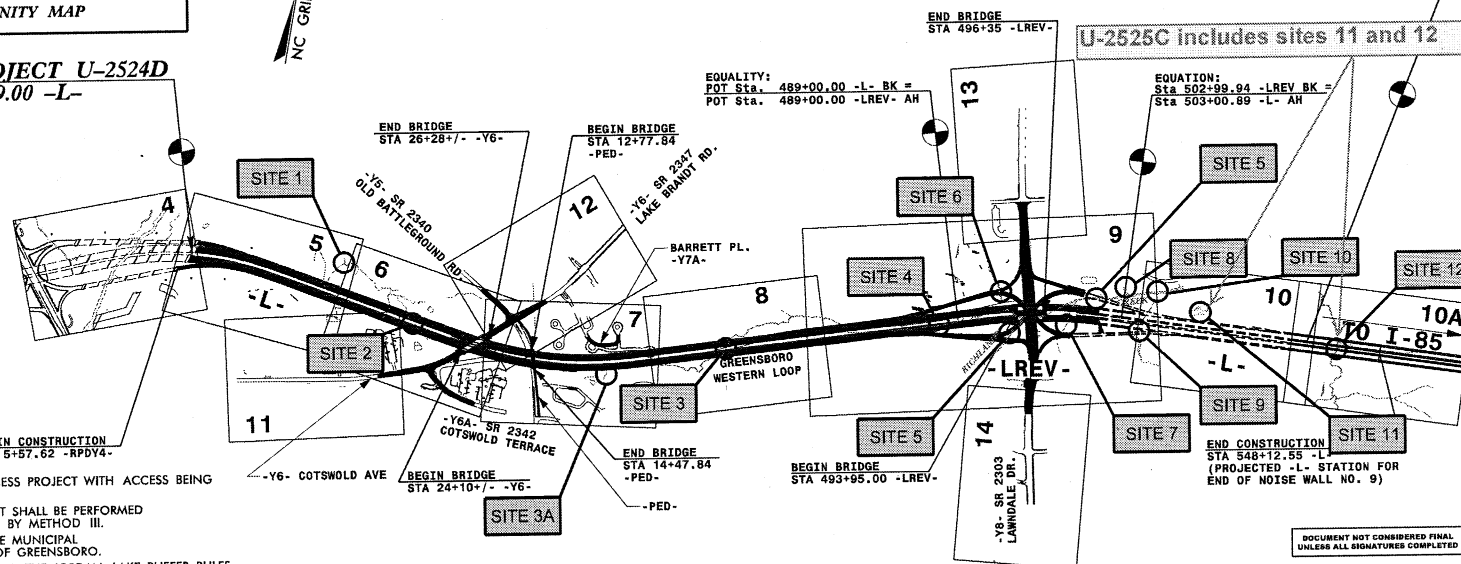
END TIP PROJECT U-2524D
POT STA 520+34.53 -L- BK.
N 871507.2766 E 1756411.5108

END TIP PROJECT U-2525C
POT STA 552+99.67 -L- AH.
N 871505.0126 E 1756411.6682

U-2525C includes sites 11 and 12

BEGIN TIP PROJECT U-2524D
POC STA. 421+69.00 -L-

TO I-85/I-40



NOTES:
THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF GREENSBORO.
THIS PROJECT IS EXEMPT FROM THE JORDAN LAKE BUFFER RULES THEREFORE BUFFERS ARE NOT SHOWN ON PLANS.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2016 = 65,756
ADT 2036 = 98,793
K = 10 %
D = 60 %
T = 14 % *
V = 70 MPH
* TTST =8% DUAL 6%
FUNC CLASS = FREEWAY
INTERSTATE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT
LENGTH STRUCTURES TIP PROJECT
TOTAL LENGTH OF TIP PROJECT

NCDOT CONTACT: REKHA PATEL, P.E.

PLANS PREPARED BY: PARSONS RALEIGH, NORTH CAROLINA FOR THE DIVISION OF HIGHWAYS

HNTB 343 E. SIX FORKS ROAD, SUITE 200 RALEIGH, NC 27609

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: TIM D. GOINS, P.E. *PROJECT ENGINEER*

LETTING DATE: DAVID GARRETT *PROJECT DESIGN ENGINEER*

HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

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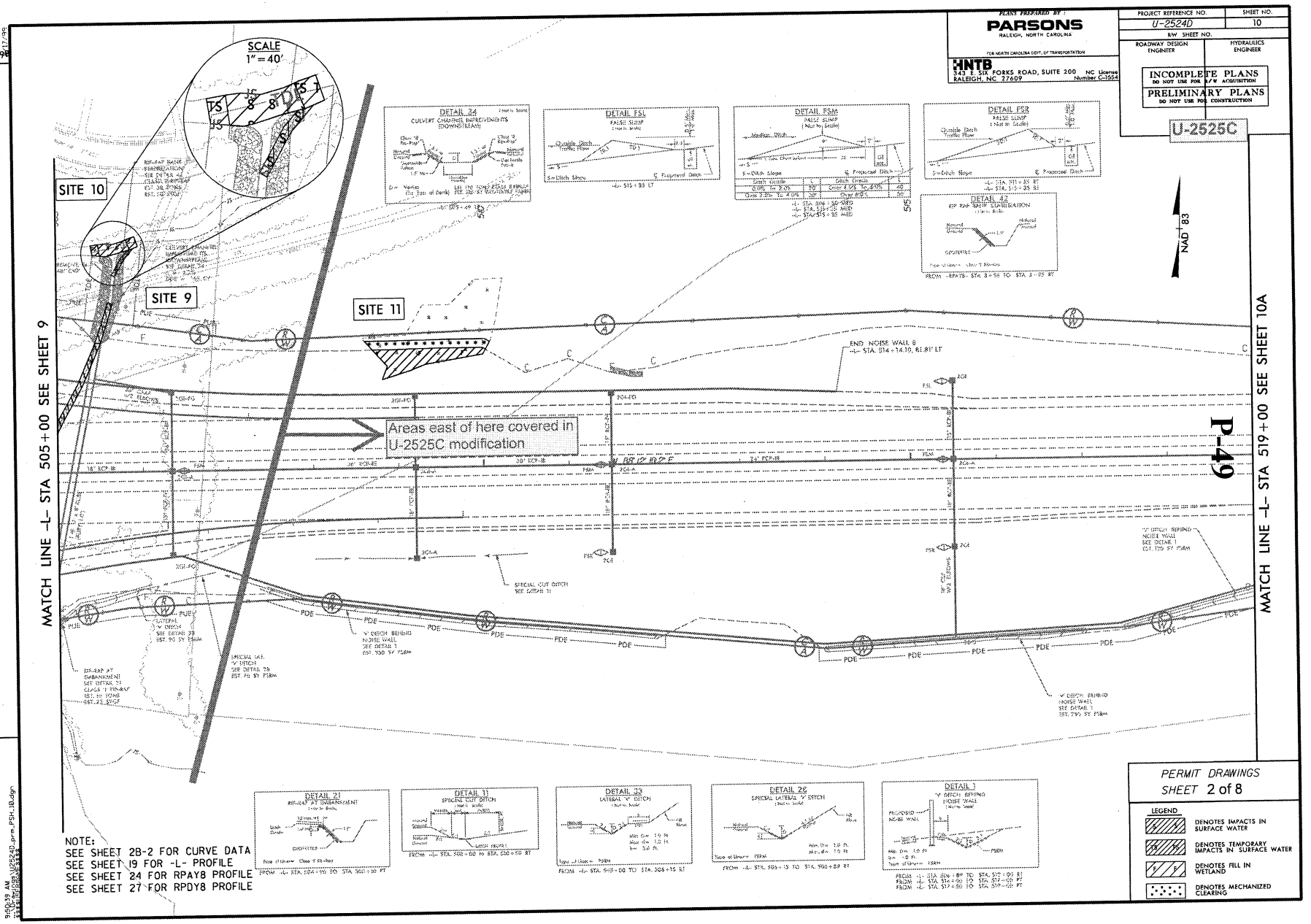
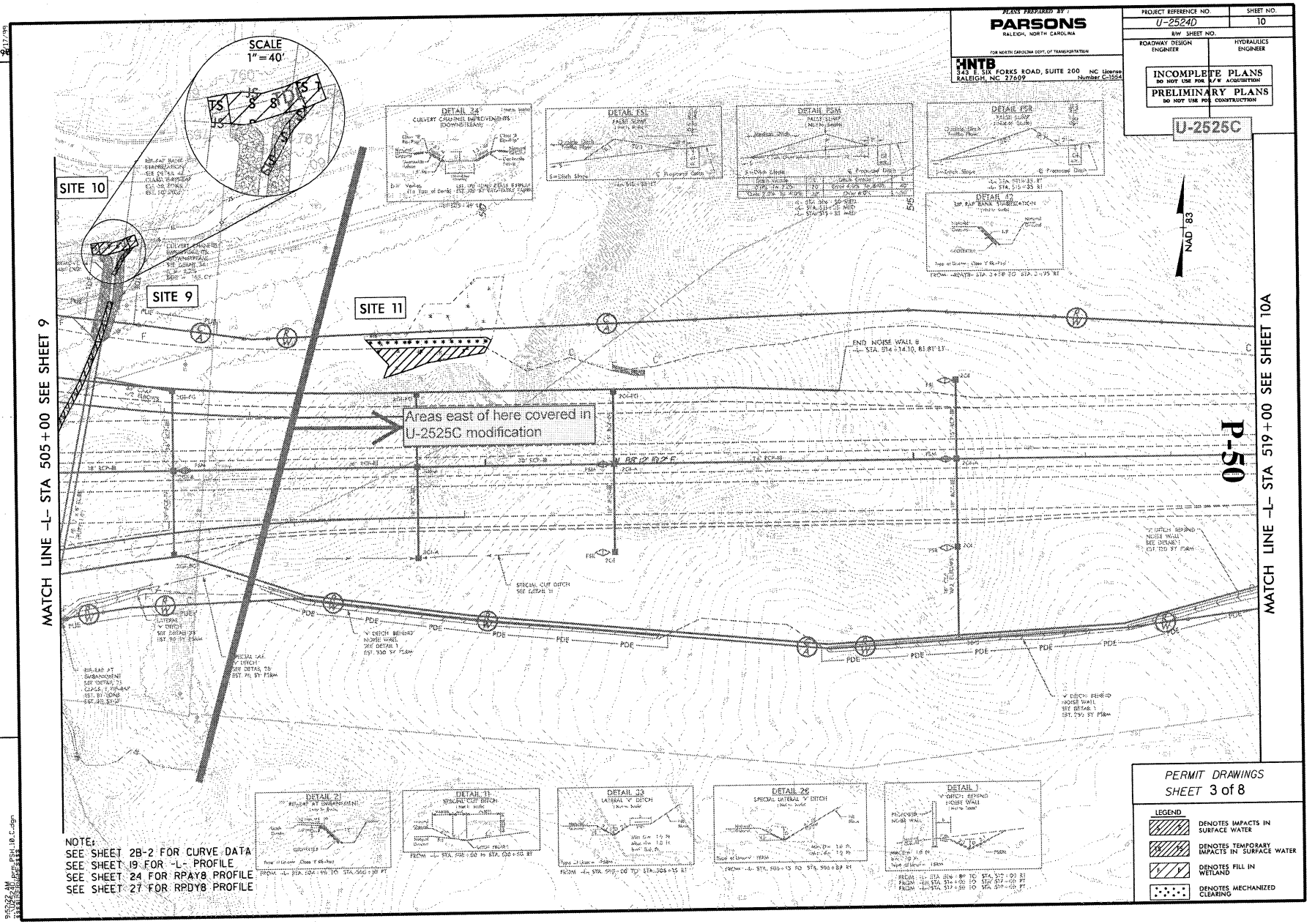
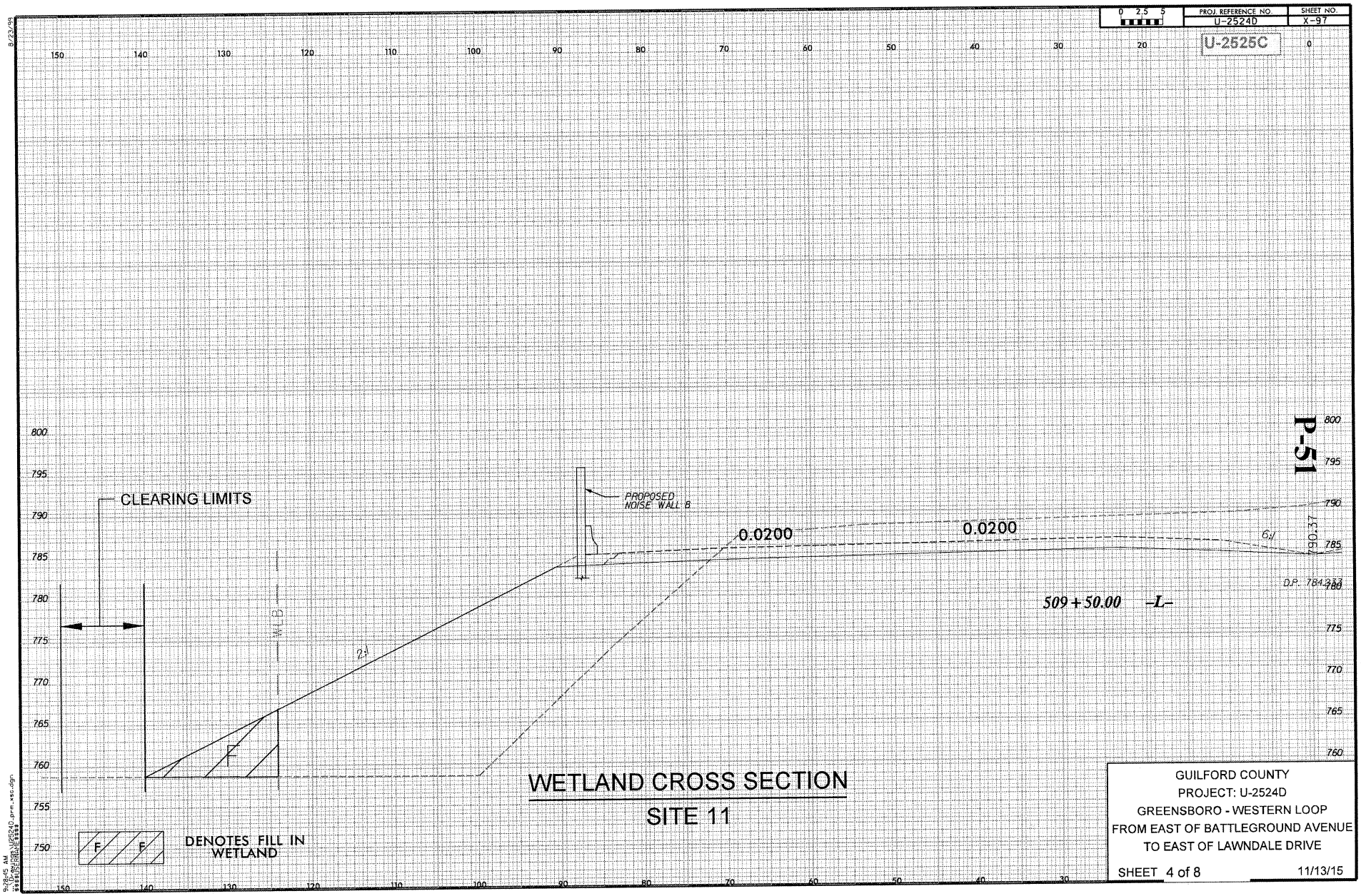
09/08/99


PLANS PREPARED BY :
PARSONS
RALEIGH, NORTH CAROLINA
FOR NORTH CAROLINA DEPT. OF TRANSPORTATION
HNTB
343 E. SIX FORKS ROAD, SUITE 200 NC License Number C-1554
RALEIGH, NC 27609
PROJECT REFERENCE NO.
U-2524D
SHEET NO.
10
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
U-2525C
SCALE
1" = 40'
SITE 10
SITE 9
SITE 11
MATCH LINE -L- STA 505+00 SEE SHEET 9
MATCH LINE -L- STA 519+00 SEE SHEET 10A
Areas east of here covered in U-2525C modification
END NOISE WALL 8
-L- STA. 514+14.10, 61.81' LT
DETAIL 24
CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM)
DETAIL ESL
FALSE SUMP
DETAIL FSM
FALSE SUMP
DETAIL FSR
FALSE SUMP
DETAIL 42
RIP RAP SLOPE STABILIZATION
NAD 83
P-49
SPECIAL CUT DITCH SEE DETAIL 11
V DITCH BEHIND NOISE WALL SEE DETAIL 1 EST. 750 SY PERM
V DITCH BEHIND NOISE WALL SEE DETAIL 1 EST. 1125 SY PERM
LATERAL V DITCH SEE DETAIL 28 EST. 90 SY PERM
SPECIAL CUT SEE DETAIL 28 EST. 90 SY PERM
RIP-RAP AT EMBANKMENT SEE DETAIL 21 CLASS I RIP-RAP EST. 110 TONS EST. 75 SQ YDS
DETAIL 21
RIP-RAP AT EMBANKMENT
DETAIL 11
SPECIAL CUT DITCH
DETAIL 33
LATERAL V DITCH
DETAIL 28
SPECIAL LATERAL V DITCH
DETAIL 1
V DITCH BEHIND NOISE WALL
NOTE:
SEE SHEET 2B-2 FOR CURVE DATA
SEE SHEET 19 FOR -L- PROFILE
SEE SHEET 24 FOR RPAY8 PROFILE
SEE SHEET 27 FOR RPDY8 PROFILE
PERMIT DRAWINGS
SHEET 2 of 8
LEGEND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
REVISIONS
8/17/99
9:50:19 AM
U-2524D_PSH_10.dgn


PLANS PREPARED BY :
PARSONS
RALEIGH, NORTH CAROLINA
FOR NORTH CAROLINA DEPT. OF TRANSPORTATION
NTB
343 E. SIX FORKS ROAD, SUITE 200 NC License
RALEIGH, NC 27609 Number C-1554
PROJECT REFERENCE NO.
U-2524D
SHEET NO.
10
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
U-2525C
SCALE
1" = 40'
SITE 10
SITE 9
SITE 11
NAD 83
MATCH LINE -L- STA 505+00 SEE SHEET 9
MATCH LINE -L- STA 519+00 SEE SHEET 10A
Areas east of here covered in U-2525C modification
END NOISE WALL 8
-L- STA. 514+14.10, 81.81' LT
P-50
DETAIL 24
DETAIL FS1
DETAIL FSR
DETAIL FSR
DETAIL 42
DETAIL 21
DETAIL 11
DETAIL 33
DETAIL 26
DETAIL 3
NOTE:
SEE SHEET 2B-2 FOR CURVE DATA
SEE SHEET 19 FOR -L- PROFILE
SEE SHEET 24 FOR RPAY8 PROFILE
SEE SHEET 27 FOR RPDY8 PROFILE
PERMIT DRAWINGS
SHEET 3 of 8
LEGEND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
REVISIONS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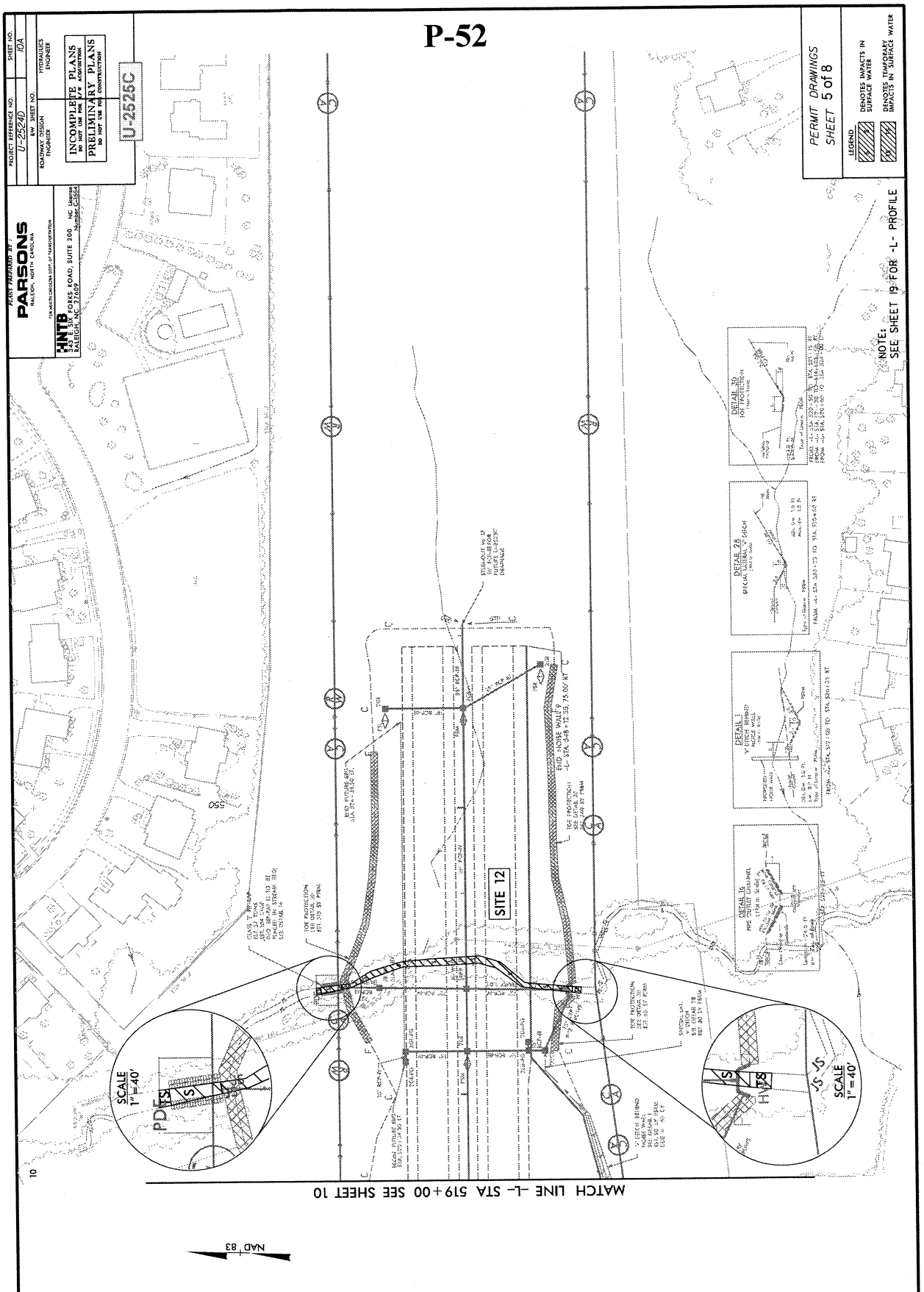
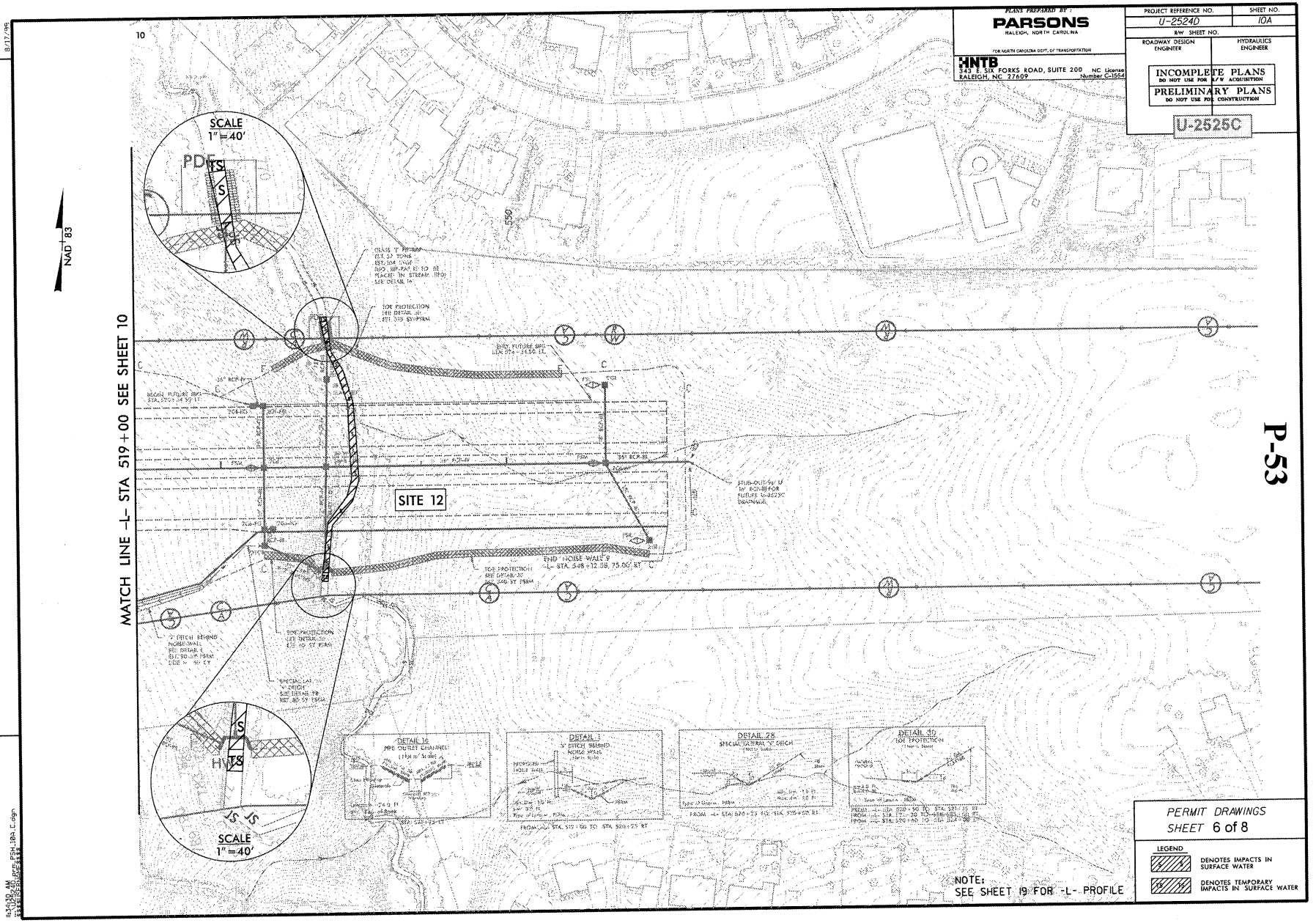
PROJ. REFERENCE NO.
U-2524D
SHEET NO.
X-97
U-2525C
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
800 795 790 785 780 775 770 765 760 755 750
P-51
CLEARING LIMITS
PROPOSED NOISE WALL B
0.0200
0.0200
6:1
790.37
D.P. 784.33
509 + 50.00 -L-
2:1
F
F
DENOTES FILL IN WETLAND
WETLAND CROSS SECTION
SITE 11
GUILFORD COUNTY
PROJECT: U-2524D
GREENSBORO - WESTERN LOOP
FROM EAST OF BATTLEGROUND AVENUE
TO EAST OF LAWNDALE DRIVE
SHEET 4 of 8
11/13/15

P-52

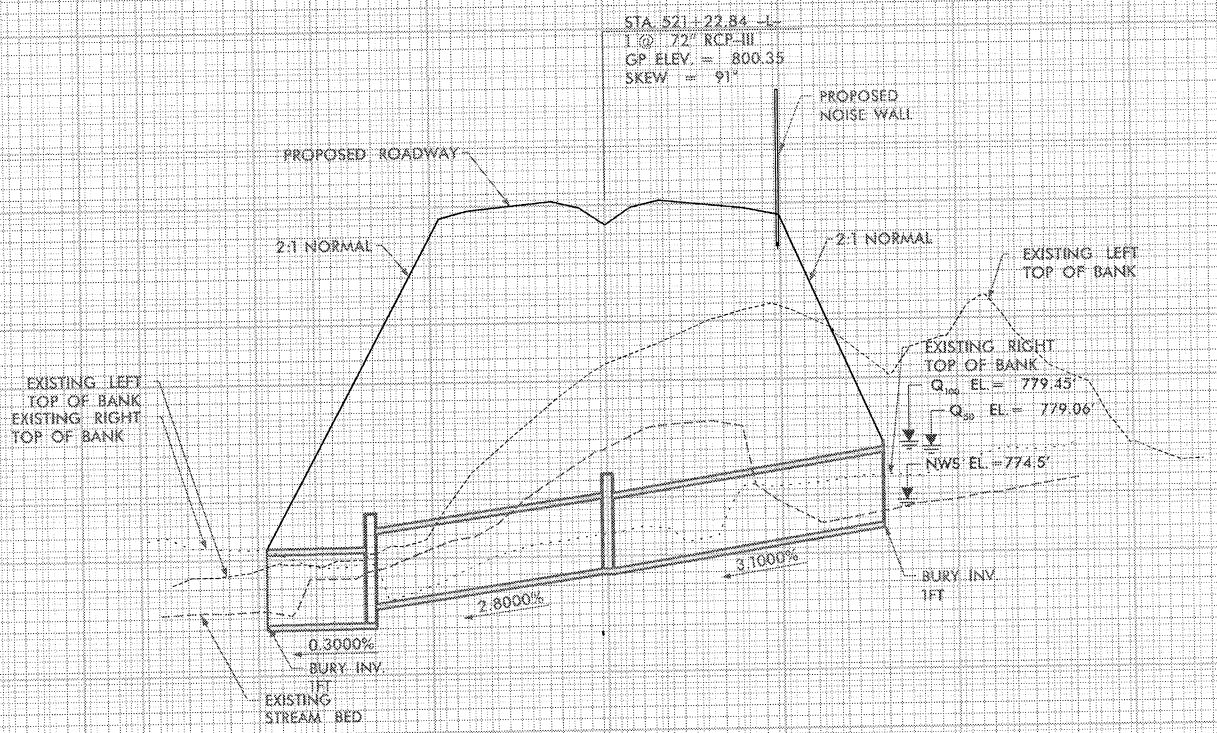

PROJECT REFERENCE NO.
U-2524D
SHEET NO.
10A
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
U-2525C
PLANS PREPARED BY:
PARSONS
RALEIGH, NORTH CAROLINA
FOR NORTH CAROLINA DEPT. OF TRANSPORTATION
NTB
NC License Number
PERMIT DRAWINGS
SHEET 5 of 8
LEGEND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
NOTE:
SEE SHEET 10 FOR -L- PROFILE
SITE 12
MATCH LINE -L- STA 519+00 SEE SHEET 10
SCALE 1"=40'
SCALE 1"=40'
NAD 83
REVISIONS
8/17/99


PLANS PREPARED BY :
PARSONS
RALEIGH, NORTH CAROLINA
FOR NORTH CAROLINA DEPT. OF TRANSPORTATION
HNTB
343 E. SIX FORKS ROAD, SUITE 200 NC License Number C-1554
RALEIGH, NC 27609
PROJECT REFERENCE NO.
U-2524D
SHEET NO.
10A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
U-2525C
P-53
REVISIONS
8/17/99
NAD 83
MATCH LINE -L- STA 519+00 SEE SHEET 10
SCALE 1" = 40'
SITE 12
DETAIL 1G
PIPE OUTLET CHANNEL
DETAIL 1
3' DITCH BEHIND NOISE WALL
DETAIL 2S
SPECIAL LATERAL 'V' DITCH
DETAIL 3G
TOE PROTECTION
END NOISE WALL 9
-L- STA. 548+12.86, 75.00' RT
NOTE:
SEE SHEET 19 FOR -L- PROFILE
PERMIT DRAWINGS
SHEET 6 of 8
LEGEND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
U-2524D	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

U-2525C



P-54

PROFILE ALONG STRUCTURE

SITE 12

SCALE
1"=50' HORIZONTAL
1"=10' VERTICAL

GUILFORD COUNTY
PROJECT: U-2524D
GREENSBORO - WESTERN LOOP
FROM EAST OF BATTLEGROUND AVENUE
TO EAST OF LAWNDALE DRIVE

SHEET 7 of 8 11/13/15

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	WETLAND IMPACTS: Temp. Fill In Wetlands (ac)	WETLAND IMPACTS: Excavation in Wetlands (ac)	WETLAND IMPACTS: Mechanized Clearing in Wetlands (ac)	WETLAND IMPACTS: Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	SURFACE WATER IMPACTS: Temp. SW impacts (ac)	SURFACE WATER IMPACTS: Existing Channel Impacts Permanent (ft)	SURFACE WATER IMPACTS: Existing Channel Impacts Temp. (ft)	SURFACE WATER IMPACTS: Natural Stream Design (ft)
11	- L- 508+61 - 510+08	Roadway Fill	0.05			0.03						
12	- L- 521+16 - 521+61	72"RCP						0.05	< 0.01	284	10	
		Bank Stabilization						< 0.01	< 0.01	24	5	
TOTALS*:			0.05			0.03		0.05	<0.01	308	15	0

*Rounded totals are sum of actual impacts

NOTES:
- Sites 11 and 12 will be included in the construction of U-2524D due to construction of noise walls 8 and 9 which span these two TIPs

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Guilford
U-2525C
34821.1.1

SHEET 8 of 8

Revised 2013 10 24

County : Guilford

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	3 ACR		
0005	0022000000-E	225	UNCLASSIFIED EXCAVATION	804,300 CY		
0006	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ********** (25+19 -Y6-)	Lump Sum	L.S.	
0007	0036000000-E	225	UNDERCUT EXCAVATION	3,490 CY		
0008	0106000000-E	230	BORROW EXCAVATION	447,800 CY		
0009	0134000000-E	240	DRAINAGE DITCH EXCAVATION	13,020 CY		
0010	0141000000-E	240	BERM DITCH CONSTRUCTION	50 LF		
0011	0156000000-E	250	REMOVAL OF EXISTING ASPHALT PAVEMENT	3,800 SY		
0012	0192000000-N	260	PROOF ROLLING	40 HR		
0013	0195000000-E	265	SELECT GRANULAR MATERIAL	4,000 CY		
0014	0196000000-E	270	GEOTEXTILE FOR SOIL STABILIZATION	9,650 SY		
0015	0318000000-E	300	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES	2,805 TON		
0016	0320000000-E	300	FOUNDATION CONDITIONING GEOTEXTILE	10,586 SY		
0017	0342000000-E	310	*** SIDE DRAIN PIPE (30")	100 LF		
0018	0342000000-E	310	*** SIDE DRAIN PIPE (36")	112 LF		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0019	0343000000-E	310	15" SIDE DRAIN PIPE	1,148 LF		
0020	0344000000-E	310	18" SIDE DRAIN PIPE	204 LF		
0021	0345000000-E	310	24" SIDE DRAIN PIPE	24 LF		
0022	0348000000-E	310	**" SIDE DRAIN PIPE ELBOWS (15")	12 EA		
0023	0348000000-E	310	**" SIDE DRAIN PIPE ELBOWS (18")	2 EA		
0024	0354000000-E	310	***" RC PIPE CULVERTS, CLASS ***** (30", V)	300 LF		
0025	0366000000-E	310	15" RC PIPE CULVERTS, CLASS III	3,468 LF		
0026	0372000000-E	310	18" RC PIPE CULVERTS, CLASS III	2,140 LF		
0027	0378000000-E	310	24" RC PIPE CULVERTS, CLASS III	2,212 LF		
0028	0384000000-E	310	30" RC PIPE CULVERTS, CLASS III	1,072 LF		
0029	0390000000-E	310	36" RC PIPE CULVERTS, CLASS III	1,976 LF		
0030	0402000000-E	310	48" RC PIPE CULVERTS, CLASS III	432 LF		
0031	0414000000-E	310	60" RC PIPE CULVERTS, CLASS III	532 LF		
0032	0426000000-E	310	72" RC PIPE CULVERTS, CLASS III	44 LF		
0033	0448000000-E	310	***** RC PIPE CULVERTS, CLASS IV (72")	216 LF		
0034	0448200000-E	310	15" RC PIPE CULVERTS, CLASS IV	5,144 LF		
0035	0448300000-E	310	18" RC PIPE CULVERTS, CLASS IV	164 LF		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0036	0448400000-E	310	24" RC PIPE CULVERTS, CLASS IV	420 LF		
0037	0448500000-E	310	30" RC PIPE CULVERTS, CLASS IV	512 LF		
0038	0448600000-E	310	36" RC PIPE CULVERTS, CLASS IV	324 LF		
0039	0576000000-E	310	**" CS PIPE CULVERTS, *****" THICK (36", 0.079")	134 LF		
0040	0582000000-E	310	15" CS PIPE CULVERTS, 0.064" THICK	132 LF		
0041	0588000000-E	310	18" CS PIPE CULVERTS, 0.064" THICK	200 LF		
0042	0594000000-E	310	24" CS PIPE CULVERTS, 0.064" THICK	24 LF		
0043	0600000000-E	310	30" CS PIPE CULVERTS, 0.079" THICK	32 LF		
0044	0636000000-E	310	**" CS PIPE ELBOWS, *****" THICK (15", 0.064")	4 EA		
0045	0636000000-E	310	**" CS PIPE ELBOWS, *****" THICK (18", 0.064")	5 EA		
0046	0636000000-E	310	**" CS PIPE ELBOWS, *****" THICK (30", 0.079")	1 EA		
0047	0636000000-E	310	**" CS PIPE ELBOWS, *****" THICK (36", 0.079")	4 EA		
0048	0938000000-E	SP	*** X **" CS STRUCTURAL PLATE PIPE ARCH, ** GAUGE (154" X 100", 8)	125 LF		
0049	0995000000-E	340	PIPE REMOVAL	6,176 LF		
0050	1011000000-N	500	FINE GRADING	Lump Sum	L.S.	
0051	1044000000-E	501	LIME TREATED SOIL (SLURRY METHOD)	54,150 SY		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0052	1066000000-E	501	LIME FOR LIME TREATED SOIL	550 TON		
0053	1110000000-E	510	STABILIZER AGGREGATE	2,000 TON		
0054	1115000000-E	SP	GEOTEXTILE FOR PAVEMENT STABILIZATION	63,312 SY		
0055	1121000000-E	520	AGGREGATE BASE COURSE	7,400 TON		
0056	1176000000-E	542	SOIL CEMENT BASE	81,230 SY		
0057	1187000000-E	542	PORTLAND CEMENT FOR SOIL CEMENT BASE	2,234 TON		
0058	1198000000-E	542	AGGREGATE FOR SOIL CEMENT BASE	2,240 TON		
0059	1209000000-E	543	ASPHALT CURING SEAL	19,350 GAL		
0060	1220000000-E	545	INCIDENTAL STONE BASE	100 TON		
0061	1275000000-E	600	PRIME COAT	2,590 GAL		
0062	1308000000-E	607	MILLING ASPHALT PAVEMENT, ****" TO ******" (0" TO 3")	270 SY		
0063	1330000000-E	607	INCIDENTAL MILLING	1,920 SY		
0064	1489000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	20,020 TON		
0065	1498000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	7,430 TON		
0066	1503000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C	1,630 TON		
0067	1519000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	7,350 TON		
0068	1523000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	1,210 TON		
0069	1525000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A	5,730 TON		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0070	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	2,490 TON		
0071	1682000000-E	652	PERMEABLE ASPHALT DRAINAGE COURSE, TYPE P-57	11,070 TON		
0072	1693000000-E	654	ASPHALT PLANT MIX, PAVEMENT REPAIR	266 TON		
0073	1847000000-E	710	******" PORT CEM CONC PAVEMENT, THROUGH LANES (WITH DOWELS) (10-1/2")	64,205 SY		
0074	1858000000-E	710	******" PORT CEM CONC PAVEMENT, RAMPS (WITH DOWELS) (10-1/2")	12,740 SY		
0075	1869000000-E	710	******" PORT CEM CONC PAVEMENT, MISCELLANEOUS (WITHOUT DOWELS) (3-1/2")	632 SY		
0076	1881000000-E	SP	GENERIC PAVING ITEM MILLED RUMBLE STRIPS (CONCRETE SHOULDER)	31,000 LF		
0077	1913000000-E	720	CONCRETE SHOULDERS ADJACENT TO *******" PAVEMENT (10-1/2")	45,023 SY		
0078	1924000000-N	725	FIELD LABORATORY RENTAL, PORT CEM CONC PAVEMENT	Lump Sum	L.S.	
0079	2022000000-E	815	SUBDRAIN EXCAVATION	672 CY		
0080	2026000000-E	815	GEOTEXTILE FOR SUBSURFACE DRAINS	2,000 SY		
0081	2036000000-E	815	SUBDRAIN COARSE AGGREGATE	336 CY		
0082	2044000000-E	815	6" PERFORATED SUBDRAIN PIPE	2,000 LF		
0083	2070000000-N	815	SUBDRAIN PIPE OUTLET	4 EA		
0084	2077000000-E	815	6" OUTLET PIPE	24 LF		
0085	2099000000-E	816	SHOULDER DRAIN	18,890 LF		
0086	2110000000-E	816	4" SHOULDER DRAIN PIPE	20,660 LF		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0087	2121000000-E	816	4" OUTLET PIPE FOR SHOULDER DRAINS	1,580 LF		
0088	2132000000-N	816	CONCRETE PAD FOR SHOULDER DRAIN PIPE OUTLET	30 EA		
0089	2143000000-E	818	BLOTTING SAND	20 TON		
0090	2209000000-E	838	ENDWALLS	11.7 CY		
0091	2220000000-E	838	REINFORCED ENDWALLS	13 CY		
0092	2275000000-E	SP	FLOWABLE FILL	455 CY		
0093	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	197 EA		
0094	2297000000-E	840	MASONRY DRAINAGE STRUCTURES	39.62 CY		
0095	2308000000-E	840	MASONRY DRAINAGE STRUCTURES	203.7 LF		
0096	2354000000-N	840	FRAME WITH GRATE, STD 840.22	7 EA		
0097	2364000000-N	840	FRAME WITH TWO GRATES, STD 840.16	14 EA		
0098	2364200000-N	840	FRAME WITH TWO GRATES, STD 840.20	40 EA		
0099	2365000000-N	840	FRAME WITH TWO GRATES, STD 840.22	74 EA		
0100	2366000000-N	840	FRAME WITH TWO GRATES, STD 840.24	2 EA		
0101	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	12 EA		
0102	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	19 EA		
0103	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	20 EA		
0104	2396000000-N	840	FRAME WITH COVER, STD 840.54	7 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0105	2451000000-N	852	CONCRETE TRANSITIONAL SECTION FOR DROP INLET	5 EA		
0106	2462000000-E	SP	**" SLUICE GATE (30")	1 EA		
0107	2462000000-E	SP	**" SLUICE GATE (36")	1 EA		
0108	2549000000-E	846	2'-6" CONCRETE CURB & GUTTER	12,340 LF		
0109	2577000000-E	846	CONCRETE EXPRESSWAY GUTTER	1,360 LF		
0110	2591000000-E	848	4" CONCRETE SIDEWALK	4,170 SY		
0111	2605000000-N	848	CONCRETE CURB RAMP	52 EA		
0112	2612000000-E	848	6" CONCRETE DRIVEWAY	120 SY		
0113	2619000000-E	850	4" CONCRETE PAVED DITCH	1,900 SY		
0114	2647000000-E	852	5" MONOLITHIC CONCRETE ISLANDS (SURFACE MOUNTED)	600 SY		
0115	2724000000-E	857	PRECAST REINFORCED CONCRETE BARRIER, SINGLE FACED	8,260 LF		
0116	2738000000-E	SP	GENERIC PAVING ITEM TEMPORARY SIDEWALK	1,000 SY		
0117	2759000000-N	SP	GENERIC PAVING ITEM MEDIAN HAZARD PROTECTION	1 EA		
0118	2850000000-N	858	GENERIC DRAINAGE ITEM ADJUSTMENT OF JUNCTION BOX	1 EA		
0119	2860000000-N	859	CONVERT EXISTING CATCH BASIN TO JUNCTION BOX	1 EA		
0120	3000000000-N	SP	IMPACT ATTENUATOR UNIT, TYPE 350	1 EA		
0121	3030000000-E	862	STEEL BM GUARDRAIL	18,525 LF		
0122	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	20 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0123	3210000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE CAT-1	8 EA		
0124	3215000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE III	3 EA		
0125	3270000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE 350	12 EA		
0126	3285000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE M-350	1 EA		
0127	3317000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE B-77	30 EA		
0128	3380000000-E	862	TEMPORARY STEEL BM GUARDRAIL	275 LF		
0129	3387000000-N	862	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE ********** (CAT-1)	1 EA		
0130	3389100000-N	SP	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE 350	1 EA		
0131	3435000000-N	SP	GENERIC GUARDRAIL ITEM STEEL BOLLARDS	3 EA		
0132	3503000000-E	866	WOVEN WIRE FENCE, 47" FABRIC	5,240 LF		
0133	3509000000-E	866	4" TIMBER FENCE POSTS, 7'-6" LONG	314 EA		
0134	3515000000-E	866	5" TIMBER FENCE POSTS, 8'-0" LONG	111 EA		
0135	3536000000-E	866	CHAIN LINK FENCE, 48" FABRIC	15,863 LF		
0136	3542000000-E	866	METAL LINE POSTS FOR 48" CHAIN LINK FENCE	1,224 EA		
0137	3548000000-E	866	METAL TERMINAL POSTS FOR 48" CHAIN LINK FENCE	124 EA		
0138	3551000000-E	866	METAL GATE POSTS FOR ** CHAIN LINK FENCE, SINGLE GATE (48")	2 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0139	3564000000-E	866	SINGLE GATES, **" HIGH, **' WIDE, **' OPENING (48", 15', 15')	1 EA		
0140	3575000000-E	SP	GENERIC FENCING ITEM TEMPORARY 48" CHAIN LINK FENCE WITH POSTS	1,181 LF		
0141	3628000000-E	876	RIP RAP, CLASS I	1,716 TON		
0142	3635000000-E	876	RIP RAP, CLASS II	145 TON		
0143	3649000000-E	876	RIP RAP, CLASS B	85 TON		
0144	3656000000-E	876	GEOTEXTILE FOR DRAINAGE	6,522 SY		
0145	4048000000-E	902	REINFORCED CONCRETE SIGN FOUNDATIONS	3 CY		
0146	4054000000-E	902	PLAIN CONCRETE SIGN FOUNDATIONS	1 CY		
0147	4057000000-E	SP	OVERHEAD FOOTING	164 CY		
0148	4060000000-E	903	SUPPORTS, BREAKAWAY STEEL BEAM	2,925 LB		
0149	4072000000-E	903	SUPPORTS, 3-LB STEEL U-CHANNEL	1,334 LF		
0150	4080000000-N	903	SUPPORTS, BARRIER (LARGE)	2 EA		
0151	4082100000-N	SP	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (01+50 -SPC Y8-)	Lump Sum	L.S.	
0152	4082100000-N	SP	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (10+00 -RPAY8-)	Lump Sum	L.S.	
0153	4082100000-N	SP	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (15+00 -Y8-)	Lump Sum	L.S.	
0154	4082100000-N	SP	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (22+25 -Y8-)	Lump Sum	L.S.	

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0155	4082100000-N	SP	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (425+50 -L- LT)	Lump Sum	L.S.	
0156	4082100000-N	SP	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (453+00 -L- LT)	Lump Sum	L.S.	
0157	4082100000-N	SP	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (457+50 -L-)	Lump Sum	L.S.	
0158	4082100000-N	SP	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (484+00 -L-)	Lump Sum	L.S.	
0159	4082100000-N	SP	SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (492+00 -L-)	Lump Sum	L.S.	
0160	4096000000-N	904	SIGN ERECTION, TYPE D	1 EA		
0161	4102000000-N	904	SIGN ERECTION, TYPE E	61 EA		
0162	4108000000-N	904	SIGN ERECTION, TYPE F	4 EA		
0163	4109000000-N	904	SIGN ERECTION, TYPE *** (OVERHEAD) (A)	7 EA		
0164	4109000000-N	904	SIGN ERECTION, TYPE *** (OVERHEAD) (B)	1 EA		
0165	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)	4 EA		
0166	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B)	1 EA		
0167	4114000000-N	904	SIGN ERECTION, MILEMARKERS	6 EA		
0168	4116200000-N	904	SIGN ERECTION, REPOSITION OVERHEAD	3 EA		
0169	4155000000-N	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	40 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0170	4234000000-N	907	DISPOSAL OF SIGN, A OR B (OVERHEAD)	3 EA		
0171	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	1,493 SF		
0172	4405000000-E	1110	WORK ZONE SIGNS (PORTABLE)	672 SF		
0173	4410000000-E	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	796 SF		
0174	4415000000-N	1115	FLASHING ARROW BOARD	2 EA		
0175	4420000000-N	1120	PORTABLE CHANGEABLE MESSAGE SIGN	4 EA		
0176	4430000000-N	1130	DRUMS	243 EA		
0177	4445000000-E	1145	BARRICADES (TYPE III)	432 LF		
0178	4455000000-N	1150	FLAGGER	255 DAY		
0179	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	5 EA		
0180	4470000000-N	1160	RESET TEMPORARY CRASH CUSHION	5 EA		
0181	4480000000-N	1165	TMA	4 EA		
0182	4490000000-E	1170	PORTABLE CONCRETE BARRIER (ANCHORED)	2,426 LF		
0183	4520000000-N	1266	TUBULAR MARKERS (FIXED)	52 EA		
0184	4589000000-N	SP	GENERIC TRAFFIC CONTROL ITEM PROTECTIVE CANOPY	Lump Sum	L.S.	
0185	4650000000-N	1251	TEMPORARY RAISED PAVEMENT MARKERS	373 EA		
0186	4695000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)	275 LF		
0187	4697000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 120 MILS)	224 LF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0188	4710000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)	1,205 LF		
0189	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	89 EA		
0190	4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	61,383 LF		
0191	4820000000-E	1205	PAINT PAVEMENT MARKING LINES (8")	4,160 LF		
0192	4835000000-E	1205	PAINT PAVEMENT MARKING LINES (24")	2,799 LF		
0193	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	162 EA		
0194	4847000000-E	1205	POLYUREA PAVEMENT MARKING LINES (4", **********) (HIGHLY REFELCTIVE ELEMENTS)	11,487 LF		
0195	4847100000-E	1205	POLYUREA PAVEMENT MARKING LINES (6", **********) (HIGHLY REFELCTIVE ELEMENTS)	58,957 LF		
0196	4847110000-E	1205	POLYUREA PAVEMENT MARKING LINES (8", **********) (HIGHLY REFELCTIVE ELEMENTS)	628 LF		
0197	4847120000-E	1205	POLYUREA PAVEMENT MARKING LINES (12", **********) (HIGHLY REFELCTIVE ELEMENTS)	2,653 LF		
0198	4850000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (4")	5,033 LF		
0199	4855000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (6")	5,789 LF		
0200	4860000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (8")	163 LF		
0201	4875000000-N	1205	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS	9 EA		
0202	4900000000-N	1251	PERMANENT RAISED PAVEMENT MARKERS	208 EA		
0203	4905000000-N	1253	SNOWPLOWABLE PAVEMENT MARKERS	811 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0204	5325600000-E	1510	6" WATER LINE	242 LF		
0205	5325800000-E	1510	8" WATER LINE	430 LF		
0206	5326200000-E	1510	12" WATER LINE	367 LF		
0207	5546000000-E	1515	8" VALVE	1 EA		
0208	5571600000-E	1515	6" TAPPING VALVE	2 EA		
0209	5672000000-N	1515	RELOCATE FIRE HYDRANT	5 EA		
0210	5691300000-E	1520	8" SANITARY GRAVITY SEWER	4,313 LF		
0211	5691500000-E	1520	12" SANITARY GRAVITY SEWER	5,315 LF		
0212	5691600000-E	1520	16" SANITARY GRAVITY SEWER	25 LF		
0213	5768000000-N	1520	SANITARY SEWER CLEAN-OUT	35 EA		
0214	5775000000-E	1525	4' DIA UTILITY MANHOLE	43 EA		
0215	5781000000-E	1525	UTILITY MANHOLE WALL, 4' DIA	370 LF		
0216	5798000000-E	1530	ABANDON **" UTILITY PIPE (15")	922 LF		
0217	5800000000-E	1530	ABANDON 6" UTILITY PIPE	660 LF		
0218	5801000000-E	1530	ABANDON 8" UTILITY PIPE	9,691 LF		
0219	5802000000-E	1530	ABANDON 10" UTILITY PIPE	546 LF		
0220	5804000000-E	1530	ABANDON 12" UTILITY PIPE	330 LF		
0221	5815000000-N	1530	REMOVE WATER METER	71 EA		
0222	5815500000-N	1530	REMOVE FIRE HYDRANT	4 EA		
0223	5816000000-N	1530	ABANDON UTILITY MANHOLE	38 EA		
0224	5828000000-N	1530	REMOVE UTILITY MANHOLE	13 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0225	5835800000-E	1540	18" ENCASEMENT PIPE	400 LF		
0226	5836000000-E	1540	24" ENCASEMENT PIPE	1,430 LF		
0227	5872000000-E	1550	TRENCHLESS INSTALLATION OF 18" IN SOIL	40 LF		
0228	5872010000-E	1550	TRENCHLESS INSTALLATION OF 18" NOT IN SOIL	40 LF		
0229	5872200000-E	1550	TRENCHLESS INSTALLATION OF 24" IN SOIL	310 LF		
0230	5872210000-E	1550	TRENCHLESS INSTALLATION OF 24" NOT IN SOIL	310 LF		
0231	6000000000-E	1605	TEMPORARY SILT FENCE	68,265 LF		
0232	6006000000-E	1610	STONE FOR EROSION CONTROL, CLASS A	2,100 TON		
0233	6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	16,860 TON		
0234	6012000000-E	1610	SEDIMENT CONTROL STONE	23,300 TON		
0235	6015000000-E	1615	TEMPORARY MULCHING	90.5 ACR		
0236	6018000000-E	1620	SEED FOR TEMPORARY SEEDING	4,300 LB		
0237	6021000000-E	1620	FERTILIZER FOR TEMPORARY SEED-ING	23.5 TON		
0238	6024000000-E	1622	TEMPORARY SLOPE DRAINS	8,630 LF		
0239	6029000000-E	SP	SAFETY FENCE	200 LF		
0240	6030000000-E	1630	SILT EXCAVATION	174,210 CY		
0241	6036000000-E	1631	MATTING FOR EROSION CONTROL	86,000 SY		
0242	6037000000-E	SP	COIR FIBER MAT	450 SY		
0243	6038000000-E	SP	PERMANENT SOIL REINFORCEMENT MAT	6,540 SY		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0244	6042000000-E	1632	1/4" HARDWARE CLOTH	10,340 LF		
0245	6045000000-E	SP	**" TEMPORARY PIPE (18")	620 LF		
0246	6045000000-E	SP	**" TEMPORARY PIPE (24")	315 LF		
0247	6045000000-E	SP	**" TEMPORARY PIPE (30")	162 LF		
0248	6046000000-E	1636	TEMPORARY PIPE FOR STREAM CROSSING	200 LF		
0249	6070000000-N	1639	SPECIAL STILLING BASINS	6 EA		
0250	6071012000-E	SP	COIR FIBER WATTLE	7,560 LF		
0251	6071014000-E	SP	COIR FIBER WATTLE BARRIER	270 LF		
0252	6071020000-E	SP	POLYACRYLAMIDE (PAM)	5,940 LB		
0253	6071030000-E	1640	COIR FIBER BAFFLE	13,785 LF		
0254	6071050000-E	SP	**" SKIMMER (1-1/2")	23 EA		
0255	6071050000-E	SP	**" SKIMMER (2")	7 EA		
0256	6071050000-E	SP	**" SKIMMER (2-1/2")	2 EA		
0257	6071050000-E	SP	**" SKIMMER (3")	1 EA		
0258	6071050000-E	SP	**" SKIMMER (4")	1 EA		
0259	6084000000-E	1660	SEEDING & MULCHING	108 ACR		
0260	6087000000-E	1660	MOWING	99 ACR		
0261	6090000000-E	1661	SEED FOR REPAIR SEEDING	900 LB		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0262	6093000000-E	1661	FERTILIZER FOR REPAIR SEEDING	4.25 TON		
0263	6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	2,575 LB		
0264	6108000000-E	1665	FERTILIZER TOPDRESSING	77 TON		
0265	6111000000-E	SP	IMPERVIOUS DIKE	585 LF		
0266	6114500000-N	1667	SPECIALIZED HAND MOWING	80 MHR		
0267	6117000000-N	SP	RESPONSE FOR EROSION CONTROL	100 EA		
0268	6132000000-N	SP	GENERIC EROSION CONTROL ITEM CONCRETE WASHOUT STRUCTURE	8 EA		
0269	6147000000-E	SP	GENERIC EROSION CONTROL ITEM REINSTALLATION OF TEMPORARY PIPE FOR CLEAN WATER DIVERSION	800 LF		
0270	7048500000-E	1705	PEDESTRIAN SIGNAL HEAD (16", 1 SECTION W/COUNTDOWN)	27 EA		
0271	7060000000-E	1705	SIGNAL CABLE	12,900 LF		
0272	7120000000-E	1705	VEHICLE SIGNAL HEAD (12", 3 SECTION)	35 EA		
0273	7132000000-E	1705	VEHICLE SIGNAL HEAD (12", 4 SECTION)	1 EA		
0274	7144000000-E	1705	VEHICLE SIGNAL HEAD (12", 5 SECTION)	1 EA		
0275	7252000000-E	1710	MESSENGER CABLE (1/4")	200 LF		
0276	7264000000-E	1710	MESSENGER CABLE (3/8")	1,350 LF		
0277	7279000000-E	1715	TRACER WIRE	11,445 LF		
0278	7288000000-E	1715	PAVED TRENCHING (**********) (1, 2")	25 LF		
0279	7300000000-E	1715	UNPAVED TRENCHING (**********) (1, 2")	1,900 LF		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0280	7300000000-E	1715	UNPAVED TRENCHING (**********) (2, 2")	1,730 LF		
0281	7300000000-E	1715	UNPAVED TRENCHING (**********) (4, 1-1/4")	5,650 LF		
0282	7300000000-E	1715	UNPAVED TRENCHING (**********) (4, 1-1/4") (1, 2")	470 LF		
0283	7301000000-E	1715	DIRECTIONAL DRILL (**********) (1, 2")	1,905 LF		
0284	7301000000-E	1715	DIRECTIONAL DRILL (**********) (2, 2")	695 LF		
0285	7301000000-E	1715	DIRECTIONAL DRILL (**********) (4, 1-1/4")	2,870 LF		
0286	7301000000-E	1715	DIRECTIONAL DRILL (**********) (4, 1-1/4") (1, 2")	230 LF		
0287	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	55 EA		
0288	7348000000-N	1716	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)	27 EA		
0289	7360000000-N	1720	WOOD POLE	1 EA		
0290	7372000000-N	1721	GUY ASSEMBLY	3 EA		
0291	7408000000-E	1722	1" RISER WITH WEATHERHEAD	3 EA		
0292	7420000000-E	1722	2" RISER WITH WEATHERHEAD	1 EA		
0293	7432000000-E	1722	2" RISER WITH HEAT SHRINK TUBING	2 EA		
0294	7444000000-E	1725	INDUCTIVE LOOP SAWCUT	4,225 LF		
0295	7456000000-E	1726	LEAD-IN CABLE (**********) (14-2)	10,225 LF		
0296	7516000000-E	1730	COMMUNICATIONS CABLE (**FIBER) (144)	11,420 LF		
0297	7516000000-E	1730	COMMUNICATIONS CABLE (**FIBER) (24)	1,400 LF		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0298	7516000000-E	1730	COMMUNICATIONS CABLE (**FIBER) (6)	1,810 LF		
0299	7528000000-E	1730	DROP CABLE	1,675 LF		
0300	7540000000-N	1731	SPLICE ENCLOSURE	5 EA		
0301	7541000000-N	1731	MODIFY SPLICE ENCLOSURE	8 EA		
0302	7552000000-N	1731	INTERCONNECT CENTER	3 EA		
0303	7566000000-N	1733	DELINEATOR MARKER	22 EA		
0304	7575160000-E	1734	REMOVE EXISTING COMMUNICATIONS CABLE	3,900 LF		
0305	7576000000-N	SP	METAL STRAIN SIGNAL POLE	16 EA		
0306	7613000000-N	SP	SOIL TEST	21 EA		
0307	7614100000-E	SP	DRILLED PIER FOUNDATION	120 CY		
0308	7636000000-N	1745	SIGN FOR SIGNALS	7 EA		
0309	7642100000-N	1743	TYPE I POST WITH FOUNDATION	6 EA		
0310	7642200000-N	1743	TYPE II PEDESTAL WITH FOUND-ATION	14 EA		
0311	7684000000-N	1750	SIGNAL CABINET FOUNDATION	3 EA		
0312	7686000000-N	1752	CONDUIT ENTRANCE INTO EXISTING FOUNDATION	2 EA		
0313	7756000000-N	1751	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)	3 EA		
0314	7780000000-N	1751	DETECTOR CARD (TYPE 2070L)	16 EA		
0315	7901000000-N	1753	CABINET BASE EXTENDER	3 EA		
0316	7948000000-N	1757	TRAFFIC SIGNAL REMOVAL	2 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0317	7960000000-N	SP	METAL POLE FOUNDATION REMOVAL	5 EA		
0318	7972000000-N	SP	METAL POLE REMOVAL	5 EA		
0319	7980000000-N	SP	GENERIC SIGNAL ITEM 5/8" X 10' GROUNDING ELECTRODE	22 EA		
0320	7980000000-N	SP	GENERIC SIGNAL ITEM 6" X 6" WOOD PEDESTAL	1 EA		
0321	7980000000-N	SP	GENERIC SIGNAL ITEM CCTV CAMERA ASSEMBLY	4 EA		
0322	7980000000-N	SP	GENERIC SIGNAL ITEM CCTV FIELD EQUIPMENT CABINET	4 EA		
0323	7980000000-N	SP	GENERIC SIGNAL ITEM CCTV METAL POLE	4 EA		
0324	7980000000-N	SP	GENERIC SIGNAL ITEM CENTRAL MEDIA CONVERTER	1 EA		
0325	7980000000-N	SP	GENERIC SIGNAL ITEM CENTRAL VIDEO DECODER UNIT	4 EA		
0326	7980000000-N	SP	GENERIC SIGNAL ITEM DMS ACCESS LADDER	1 EA		
0327	7980000000-N	SP	GENERIC SIGNAL ITEM DMS PEDESTAL STRUCTURE	1 EA		
0328	7980000000-N	SP	GENERIC SIGNAL ITEM DYNAMIC MESSAGE SIGN	1 EA		
0329	7980000000-N	SP	GENERIC SIGNAL ITEM EQUIPMENT CABINET DISCONNECT	5 EA		
0330	7980000000-N	SP	GENERIC SIGNAL ITEM ETHERNET CORE SWITCH INTERFACE MODULE	1 EA		
0331	7980000000-N	SP	GENERIC SIGNAL ITEM FIELD ETHERNET SWITCH	5 EA		
0332	7980000000-N	SP	GENERIC SIGNAL ITEM FURNISH CCTV CAMERA ASSEMBLY	1 EA		
0333	7980000000-N	SP	GENERIC SIGNAL ITEM FURNISH FIELD ETHERNET SWITCH	1 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0334	7980000000-N	SP	GENERIC SIGNAL ITEM INTERCONNECT CENTER (6-FIBER)	5 EA		
0335	7980000000-N	SP	GENERIC SIGNAL ITEM MASTER DISTRIBUTION AMPLIFIER	1 EA		
0336	7980000000-N	SP	GENERIC SIGNAL ITEM METER BASE/DISCONNECT COM-BINATION PANEL (WOOD PEDESTAL MOUNT)	1 EA		
0337	7980000000-N	SP	GENERIC SIGNAL ITEM MICROWAVE VEHICLE DETECTOR - SINGLE ZONE	1 EA		
0338	7980000000-N	SP	GENERIC SIGNAL ITEM MODIFY EXISTING ELECTRICAL SERVICE EQUIPMENT	2 EA		
0339	7980000000-N	SP	GENERIC SIGNAL ITEM RACK-MOUNTED VIDEO DECODER CHASSIS	1 EA		
0340	7985000000-N	SP	GENERIC SIGNAL ITEM INTEGRATION AND CONFIGURATION	Lump Sum	L.S.	
0341	7985000000-N	SP	GENERIC SIGNAL ITEM OVERHEAD CABLE TRAY	Lump Sum	L.S.	
0342	7990000000-E	SP	GENERIC SIGNAL ITEM #4 SOLID BARE GROUNDING CONDUCTOR	440 LF		
0343	7990000000-E	SP	GENERIC SIGNAL ITEM 3-WIRE COPPER FEEDER CONDUCTORS	1,930 LF		
0344	7990000000-E	SP	GENERIC SIGNAL ITEM 4-WIRE COPPER FEEDER CONDUCTORS	220 LF		
0345	7992000000-E	SP	GENERIC SIGNAL ITEM DMS FOUNDATION	5 CY		
0401	5776000000-E	1525	5' DIA UTILITY MANHOLE	8 EA		
0402	5782000000-E	1525	UTILITY MANHOLE WALL, 5' DIA	93 LF		

County : Guilford

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
			CULVERT ITEMS			
0346	8126000000-N	414	CULVERT EXCAVATION, STA ****** (1+26.46 -SPBY8-, CULVERT #2)	Lump Sum	L.S.	
0347	8126000000-N	414	CULVERT EXCAVATION, STA ****** (2+22.93 -SPCY8, CULVERT #3)	Lump Sum	L.S.	
0348	8126000000-N	414	CULVERT EXCAVATION, STA ****** (478+64.55 -L-, CULVERT #1)	Lump Sum	L.S.	
0349	8126000000-N	414	CULVERT EXCAVATION, STA ****** (505+19.00 -L-, CULVERT #4)	Lump Sum	L.S.	
0350	8126000000-N	414	CULVERT EXCAVATION, STA ****** (9+04.29 -RPAY8-, CULVERT #2 & CULVERT #3)	Lump Sum	L.S.	
0351	8133000000-E	414	FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	3,894 TON		
0352	8196000000-E	420	CLASS A CONCRETE (CULVERT)	4,459.8 CY		
0353	8245000000-E	425	REINFORCING STEEL (CULVERT)	566,881 LB		
			WALL ITEMS			
0354	8801000000-E	SP	MSE RETAINING WALL NO **** (W10)	5,050 SF		
0355	8801000000-E	SP	MSE RETAINING WALL NO **** (W7)	6,665 SF		
0356	8801000000-E	SP	MSE RETAINING WALL NO **** (W8)	7,475 SF		
0357	8801000000-E	SP	MSE RETAINING WALL NO **** (W9)	9,585 SF		
0358	8802030000-E	SP	SEGMENTAL GRAVITY RETAINING WALLS	400 SF		
0359	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO 1	7,455 SF		
0360	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO 2	32,285 SF		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0361	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO 3	22,845 SF		
0362	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO 6	81,315 SF		
0363	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO 7	65,100 SF		
0364	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO 8	31,365 SF		
0365	8847000000-E	SP	GENERIC RETAINING WALL ITEM SOUND BARRIER WALL NO 9	61,965 SF		
0366	8847000000-E	SP	GENERIC RETAINING WALL ITEM STEEL SHEET PILE RETAINING WALL	370 SF		
			******* BEGIN SCHEDULE IA ******* ******* (2 ALTERNATES) *******			
0367 IA1	8802010000-E	SP	SOIL NAIL RETAINING WALLS	80,475 SF		
0368 IA1	8802015100-N	SP	SOIL NAIL VERIFICATION TESTS	19 EA		
0369 IA1	8802015110-N	SP	SOIL NAIL PROOF TESTS	127 EA		
			*** OR ***			
0370 IA2	8801000000-E	SP	MSE RETAINING WALL NO **** (W12)	3,330 SF		
0371 IA2	8801000000-E	SP	MSE RETAINING WALL NO **** (W13)	3,080 SF		
0372 IA2	8802010000-E	SP	SOIL NAIL RETAINING WALLS	74,545 SF		
0373 IA2	8802015100-N	SP	SOIL NAIL VERIFICATION TESTS	15 EA		
0374 IA2	8802015110-N	SP	SOIL NAIL PROOF TESTS	115 EA		
			***** END SCHEDULE IA *****			

County : Guilford

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
			STRUCTURE ITEMS			
0375	3524000000-E	SP	VINYL COATED CHAIN LINK FENCE, *** FABRIC (79")	323.39 LF		
0376	8091000000-N	410	FOUNDATION EXCAVATION FOR BENT ** AT STATION ********** (1, 13+62.84 -PED-)	Lump Sum	L.S.	
0377	8091000000-N	410	FOUNDATION EXCAVATION FOR BENT ** AT STATION ********** (1, 25+18.62 -Y6-)	Lump Sum	L.S.	
0378	8112730000-N	450	PDA TESTING	2 EA		
0379	8147000000-E	420	REINFORCED CONCRETE DECK SLAB	43,532 SF		
0380	8161000000-E	420	GROOVING BRIDGE FLOORS	43,838 SF		
0381	8182000000-E	420	CLASS A CONCRETE (BRIDGE)	637 CY		
0382	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ********** (25+18.62 -Y6-)	Lump Sum	L.S.	
0383	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ********** (495+22.00 -LREV- LT)	Lump Sum	L.S.	
0384	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ********** (495+22.00 -LREV- RT)	Lump Sum	L.S.	
0385	8217000000-E	425	REINFORCING STEEL (BRIDGE)	110,201 LB		
0386	8238000000-E	425	SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	1,588 LB		
0387	8265000000-E	430	54" PRESTRESSED CONCRETE GIRDERS	2,039.55 LF		
0388	8280000000-E	440	APPROX ..... LBS STRUCTURAL STEEL	1,791,580 LS		
0389	8364000000-E	450	HP12X53 STEEL PILES	6,320 LF		
0390	8393000000-N	450	PILE REDRIVES	5 EA		
0391	8475000000-E	460	TWO BAR METAL RAIL	740.64 LF		

County : Guilford

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0392	8503000000-E	460	CONCRETE BARRIER RAIL	943.4 LF		
0393	8517000000-E	460	1'-**"X *****" CONCRETE PARA-PET (1'-2" X 2'-6")	340 LF		
0394	8517000000-E	460	1'-**"X *****" CONCRETE PARA-PET (1'-2" X 3'-2 3/4")	433.24 LF		
0395	8531000000-E	462	4" SLOPE PROTECTION	122 SY		
0396	8654000000-N	SP	DISC BEARINGS	Lump Sum	L.S.	
0397	8657000000-N	430	ELASTOMERIC BEARINGS	Lump Sum	L.S.	
0398	8692000000-N	SP	FOAM JOINT SEALS	Lump Sum	L.S.	
0399	8706000000-N	SP	EXPANSION JOINT SEALS	Lump Sum	L.S.	
0400	8867000000-E	SP	GENERIC STRUCTURE ITEM CONCRETE BARRIER RAIL WITH MOMENT SLAB	1,252.7 LF		

8/17/99

REVISIONS

8-11-2016 - ALL SANITARY SEWER DROP MANHOLES SHALL BE 5' DIAMETER WITH INSIDE DROP ASSEMBLIES PER COG DETAIL 203.

PROJECT REFERENCE NO.	SHEET NO.
U-2524D	UC-3A

DESIGNED BY: DMP
DRAWN BY: DMP
CHECKED BY: DMP
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

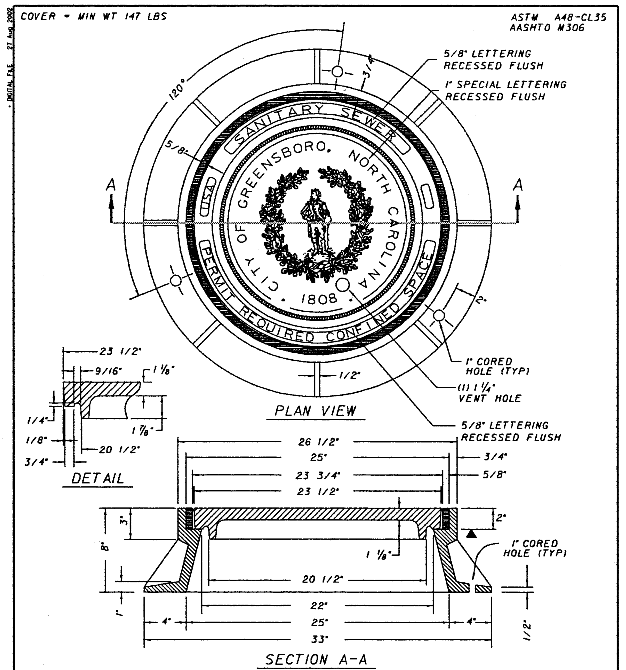
UTILITIES ENGINEERING SEC.
PHONE: (919) 707-6690
FAX: (919) 250-4151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26457 ANDREW P. LARRICK
DocuSigned by: Andrew P. Larrick
8/19/2016

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NOTE:

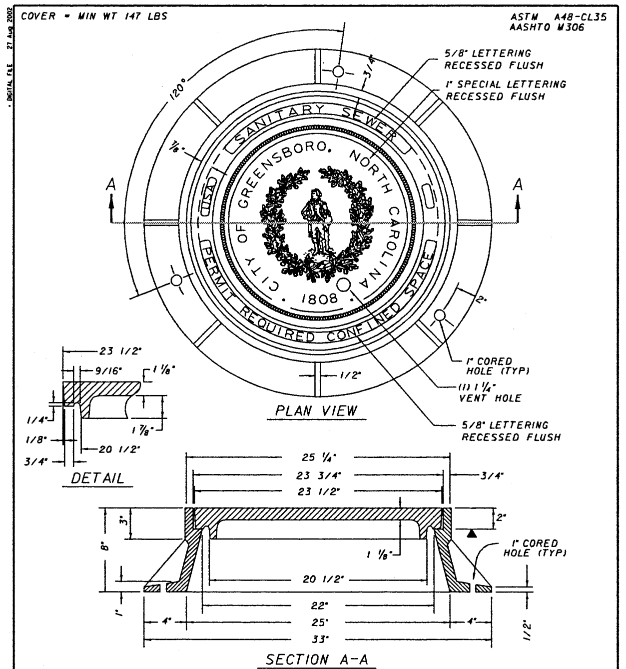
ALL DIMENSIONS AND TOLERANCES ARE TO BE CONCENTRIC AND WILL SUPERSEDE ANY ASTM STANDARDS WITH A MAXIMUM VARIATION OF +/- 1/16" ON ALL DIMENSIONS.

▼MACHINED BEARING SURFACE

CITY OF GREENSBORO

STANDARD ADJUSTABLE MANHOLE RING AND COVER FOR PAVED AREAS

STD. NO. 205-A — REV. MAY-88, JAN-97, MAR-98, MAR-01, AUG-02, DEC-05



NOTE:

ALL DIMENSIONS AND TOLERANCES ARE TO BE CONCENTRIC AND WILL SUPERSEDE ANY ASTM STANDARDS WITH A MAXIMUM VARIATION OF +/- 1/16" ON ALL DIMENSIONS.

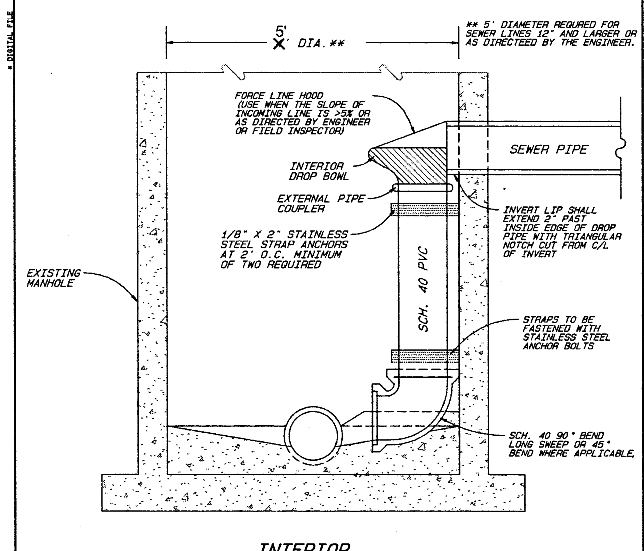
MANHOLE RING TO BE ANCHORED WITH 1/2" REDHEAD STAINLESS STEEL ANCHORS AND SEALED BETWEEN RING AND CONE WITH BITUMASTIC SEALER.

▼MACHINED BEARING SURFACE

CITY OF GREENSBORO

STANDARD MANHOLE RING AND COVER FOR NON-PAVED AREAS

STD. NO. 205 — REV. MAY-88, JAN-97, MAR-98, MAR-01, AUG-02, DEC-05



INTERIOR

NOTES:

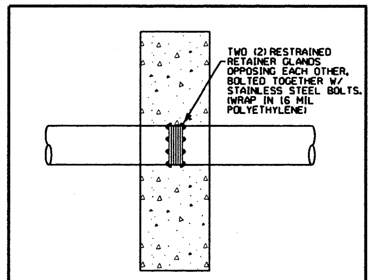
1. THIS DETAIL SHALL BE USED ONLY WHERE APPROVED BY WATER RESOURCES DEPARTMENT.
2. DROP PIPE AND NECESSARY FITTINGS SHALL BE SCH. 40 PVC.
3. EXTERNAL COUPLER SHALL BE SCH. 40 PVC OR FLEXIBLE COUPLER.
4. PROPOSED CONNECTION TO BE USED WHEN INCOMING SEWER LINE INVERT IS GREATER THAN 2'-0" ABOVE THE INVERT OUT.
5. STAINLESS STEEL STRAPS AND ANCHOR BOLTS SHALL BE TYPE 316 STAINLESS STEEL.
6. USE THE DROP PIPE SIZE (OFTEN SMALLER THAN THE INCOMING PIPE SIZE) THAT IS SPECIFIED BY THE INTERIOR DROP BOWL'S MANUFACTURER FOR THE SIZE OF THE INCOMING LINE.
7. INSTALL DROP PIPE ASSEMBLY PER MANUFACTURER'S SPECIFICATIONS. THE MANUFACTURER'S DESIGN FOR THE DROP BOWL AND PIPE ASSEMBLY MUST BE PRE-APPROVED BY ENGINEER.

CITY OF GREENSBORO

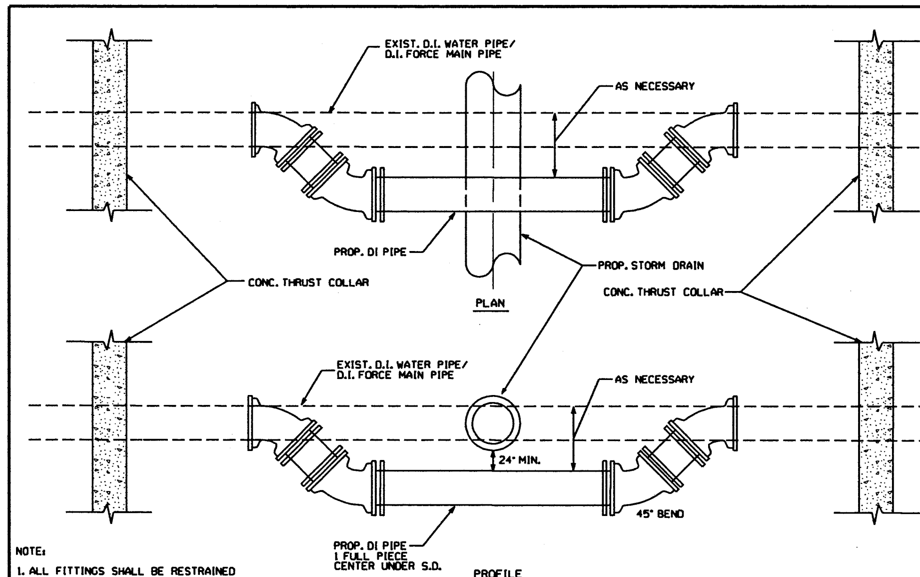
DROP CONNECTION (INTERIOR) FOR EXISTING SANITARY SEWER MANHOLE

STD. NO. 203 — REV. 06-03, 03-14

COG STD. DETAIL 203 SHALL BE USED FOR ALL SANITARY SEWER DROP MANHOLES, WITH 2.5 FEET OR MORE OF VERTICAL DROP BETWEEN THE INLET SEWER PIPE AND THE OUTLET SEWER PIPE. ALL SANITARY SEWER DROP MANHOLES SHALL BE 5' DIAMETER WITH INSIDE DROP ASSEMBLIES. THE COST OF THE INSIDE DROP ASSEMBLIES SHALL BE INCIDENTAL TO THE COST OF THE MANHOLES.



THRUST COLLAR ANCHOR



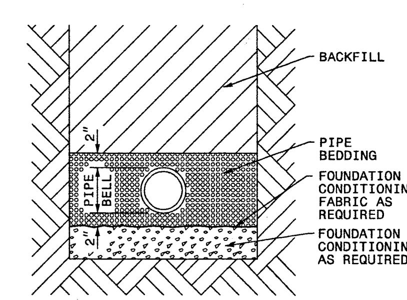
NOTE:

1. ALL FITTINGS SHALL BE RESTRAINED USING RESTRAINED RETAINER GLANDS.
2. CONC. THRUST BLOCK SHALL BE PLACED AND CURED THREE DAYS PRIOR TO CUTTING EXISTING PIPE.

•NTS

RELOCATION OF D.I. WATER PIPE OR D.I. FORCE MAIN PIPE AT PROPOSED STORM DRAINAGE AS SHOWN ON PLANS

TRENCH DETAIL



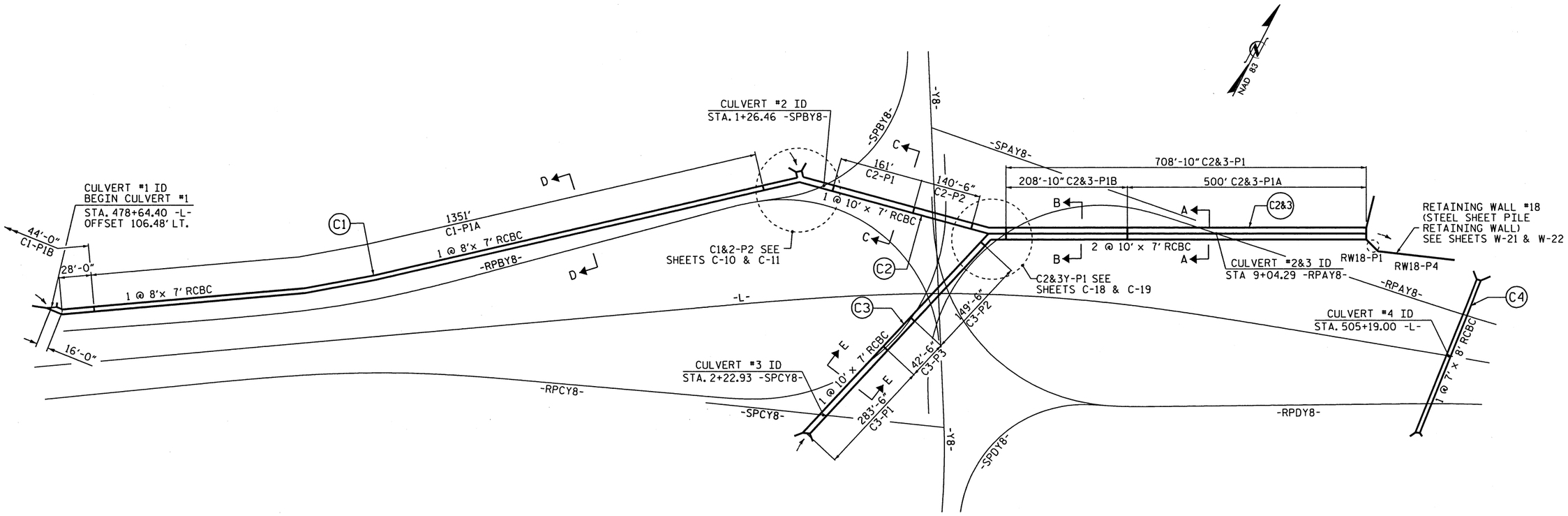
PLACE FOUNDATION CONDITIONING MATERIAL BELOW BEDDING IF REQUIRED, AS DIRECTED BY ENGINEER. PIPE BEDDED IN SELECT MATERIAL, CLASS II (TYPE 1) OR CLASS III. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROXIMATELY 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

MAXIMUM TRENCH WIDTH AT TOP OF PIPE

NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		

UTILITY CONSTRUCTION PLANS PREPARED BY:
DAVIS • MARTIN • POWELL
ENGINEERS & SURVEYORS
6415 OLD PLANK RD, HIGH POINT, NC 27265
PHONE: (336)886-4821 FAX: (336)886-4458
WWW.DMP-INC.COM LICENSE: F-0245

$$$$$$$$SYSTIME$$$$$ $$$$$$$$DGN$$$$$$$$$$$$$$$$ $$$$$USERNAME$$$$



CULVERT INDEX					
INDEX NO.	STR. NO	STATION	DESCRIPTION	PHASE CONST. NO.	SHEET NO.
C1	--	478+64.40 -L- OFFSET 106.48' LT.	SINGLE 8' X 7' RCBC	C1-P1A, C1-P1B	C-1 THRU C-6
C2	--	1+26.46 -SPBY8-	SINGLE 10' X 7' RCBC	C2-P1, C2-P2, C1&2-P2	C-7 THRU C-12
C2&3	1223	9+04.29 -RPAY8-	DOUBLE 10' X 7' RCBC COMBINATION OF CULVERTS #2 & #3	C2&3-P1A, RW18-P1, C2&3-P1B C2&3Y-P1 & RW18-P4	C-13 THRU C-22
C3	--	2+22.93 -SPCY8-	SINGLE 10' X 7' RCBC	C3-P1, C3-P2, C3-P3	C-23 THRU C-27
C4	--	505+19.00 -L-	SINGLE 7' X 8' RCBC	PHASES I & II	C-28 THRU C-34

SUMMARY OF PHASE CONSTRUCTION						
PHASE	NO.	DESCRIPTION	SIZE	LENGTH	BARREL SECTION	SHEET No.
PHASE I	**C1-P1A**	CUL #1, PHASE IA	1-8'x7'	1351'	D-D	C-1 TO C-4
	C1-P1B	CUL #1, PHASE IB	1-8'x7'	44'	D-D	C-1 TO C-5
	C2-P1	CUL #2, PHASE I	1-10'x7'	161'	C-C	C-7 TO C-9
	C2&3-P1A	CUL #2 & #3, PHASE IA	2-10'x7'	500'	A-A	C-15 & C-16
	RW18-P1	SSP RET WALL, PHASE I	PZ27	8'	--	C-15 & C-17
	C2&3-P1B	CUL #2 & #3, PHASE IB	2-10'x7'	208.8'	B-B	C-15 & C-16
	C2&3Y-P1	CUL #2 & #3, PHASE I	2-10'x7'	80.7'	B-B, C-C & E-E	C-18 & C-19
	C3-P1	CUL #3, PHASE I	1-10'x7'	283.5'	E-E	C-23 TO C-26
PHASE II	**C2-P2**	CUL #2, PHASE II	1-10'x7'	140.5'	C-C	C-7 TO C-9
	C3-P2	CUL #3, PHASE II	1-10'x7'	149.5'	E-E	C-23 TO C-25
	C1&2-P2	CUL #1 & #2, PHASE II	1-10'x7'	52.7'	C-C & D-D	C-10 TO C-12
PHASE III	**C3-P3**	CUL #3, PHASE III	1-10'x7'	42.5'	E-E	C-23 TO C-25
PHASE IV	**RW18-P4**	SSP RET WALL, PHASE IV	PZ27	54.6'	--	C-17, W-21, W-22
--	**C-4**	CUL #4, PHASES I & II	1-8'x7'	315'	--	C-28 TO C-34

PROJECT NO. U-2524D

GUILFORD COUNTY

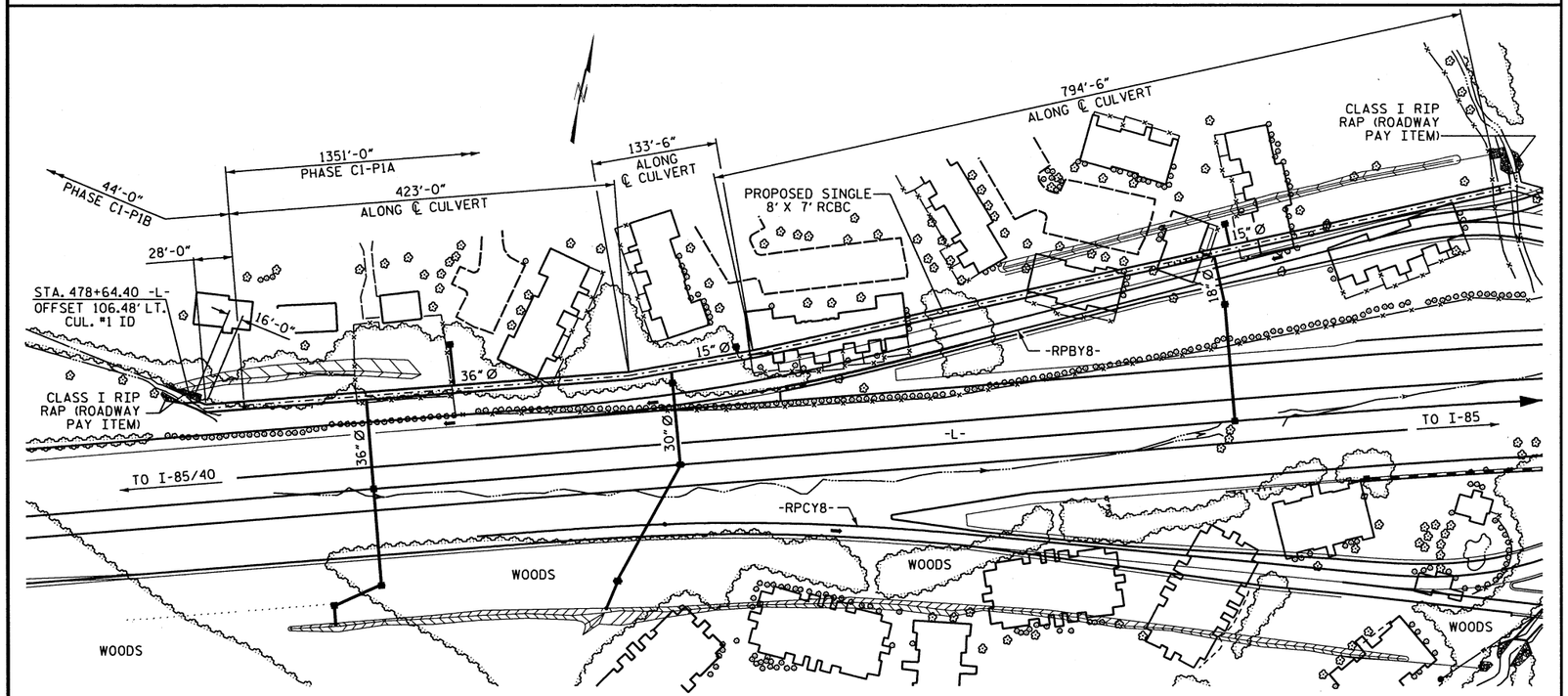
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUMMARY OF CULVERT CONSTRUCTION SEQUENCE

REVISIONS						
	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

15-AUG-2016 16:28
K:\TIPProjects-U\U2524D\Structures\Plans\culvert\u2524d_sd_cul3.dgn
tfang

BM #17: RR SPIKE SET IN CHERRY TREE, 270.77' LEFT OF -L- STA. 474+80.76, EL. 797.52'



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

HYDRAULIC DATA

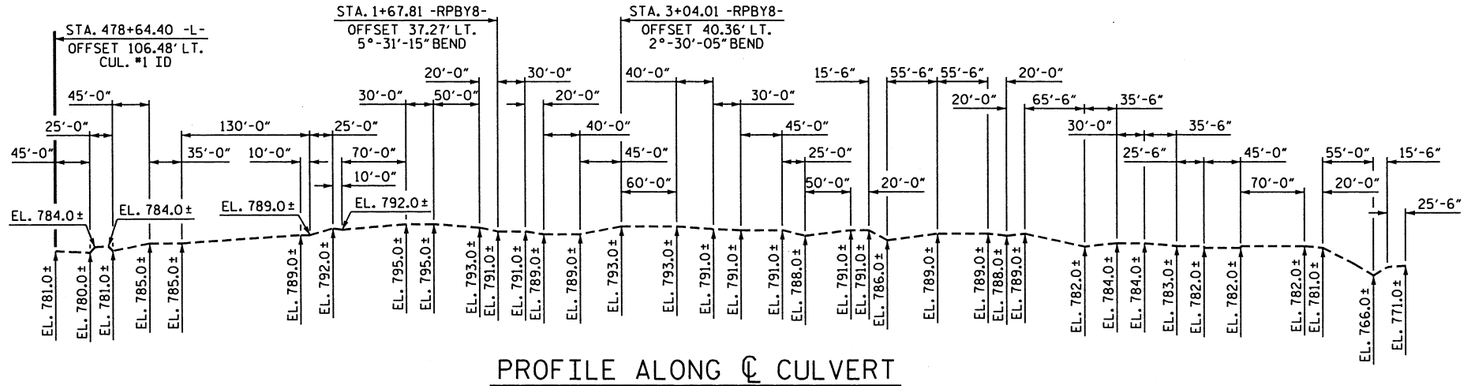
DESIGN DISCHARGE	= 180 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YRS.
DESIGN HIGH WATER ELEVATION	= 784.60
DRAINAGE AREA	= 0.15 SQ. MI.
BASE DISCHARGE (Q100)	= 200 CFS
BASE HIGH WATER ELEVATION	= 784.86

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 490 CFS
FREQUENCY OF OVERTOPPING FLOOD	= >500+ YRS.
OVERTOPPING FLOOD ELEVATION	= 790.08

GRADE DATA

GRADE POINT ELEVATION @ STA. 478+64.55 -L- 106.40' LT.	= 798.99'
BED ELEVATION @ STA. 478+64.55 -L- 106.40' LT.	= 780.70'
ROADWAY FILL SLOPES	= 2:1



PROFILE ALONG ℄ CULVERT

DRAWN BY : A. SORSENGINH DATE : 1/2016
CHECKED BY : T. H. FANG DATE : 5/15/16
DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 5/26/16

16-AUG-2016 11:10
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tfang

NOTES:

F.A. PROJECT NO. NHF-0708(53)

ASSUMED LIVE LOAD ---------- HL-93 OR ALTERNATE LOADING.

DESIGN FILL ---------- 13.33'

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

AT THE CONTRACTORS OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

ALL PIPES THROUGH THE SIDEWALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPE.

FOR CULVERT DIVERSION DETAILS & PAY ITEM, SEE EROSION CONTROL PLANS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE		
PHASE C1-P1A	1134.8	C.Y.
PHASE C1-P1B	50.0	C.Y.
TOTAL	1184.8	C.Y.
REINFORCING STEEL		
PHASE C1-P1A	172,429	LBS.
PHASE C1-P1B	6,727	LBS.
TOTAL	179,156	LBS.
FOUNDATION COND. MATERIAL		
PHASE C1-P1A	1270	TONS
PHASE C1-P1B	41	TONS
TOTAL	1311	TONS
CULVERT EXCAVATION (TOTAL)	LUMP SUM	

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIANG FANG

DocuSigned by: Ting Fang 8/16/2016 E72068400977435...

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 478+64.40 -L-

SHEET 1 OF 6

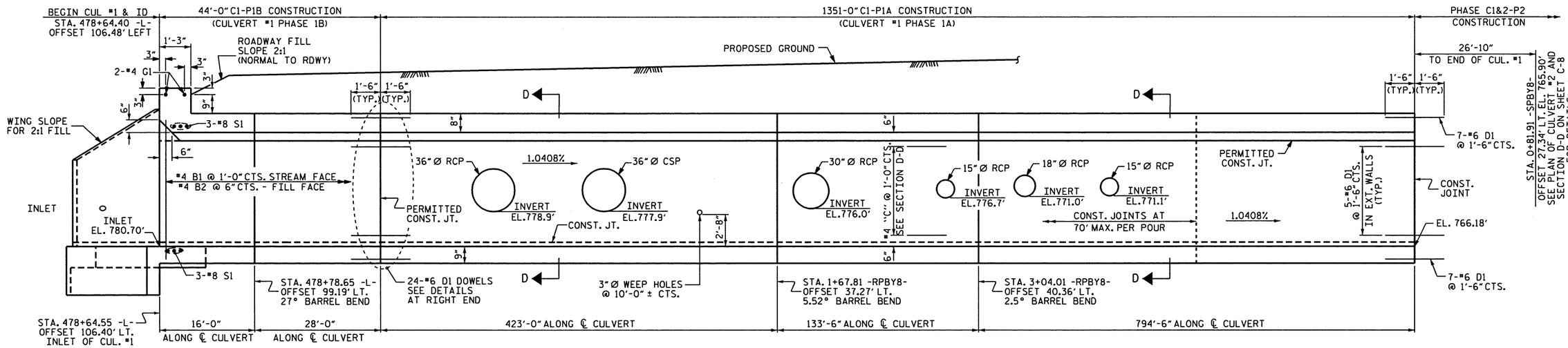
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT #1
SINGLE 8' X 7' RCBC
C1-P1A & C1-P1B
OFFSET 106.48' LEFT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-1
1			3			TOTAL SHEETS
2			4			34

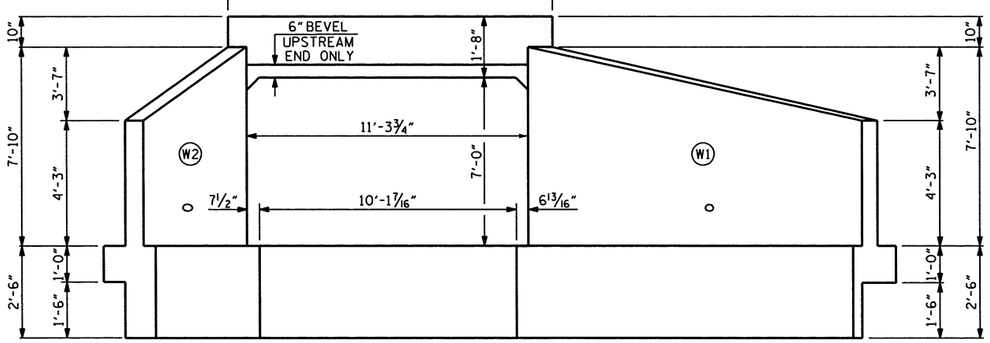
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CUL #1



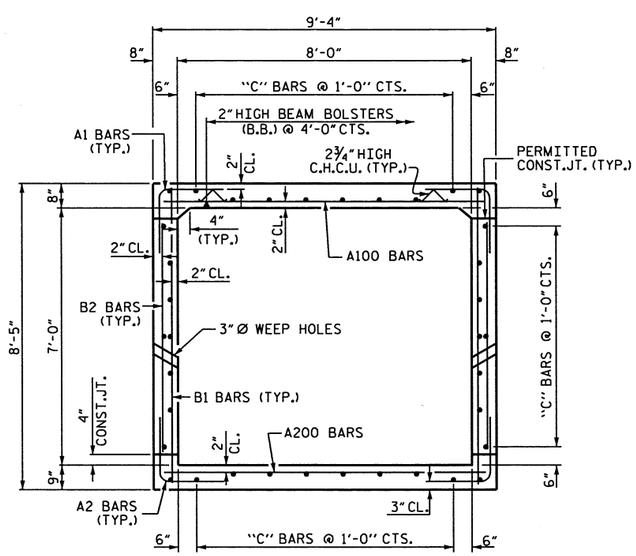
CULVERT SECTION ALONG ℄ CULVERT

FOR PIPES THRU EXTERIOR WALL, SEE WALL OPENING DETAILS.
THE CONTRACTOR HAS AN OPTION TO CONSTRUCT
C1-P1A AND C1-P1B IN ONE PHASE OR SEPARATELY.



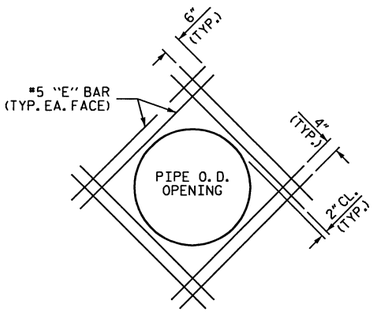
INLET END ELEVATION NORMAL TO SKEW

45° STD. WING AT INLET END



SECTION D-D

RIGHT ANGLE SECTION OF BARREL
THERE ARE 36 "C" BARS IN SECTION OF BARREL



WALL OPENING DETAILS

FOR PIPE THRU EXTERIOR WALL.
FIELD CUT & BEND "B" & "C" BARS AS NEEDED
TO CLEAR PIPE

PIPE SIZE	O.D.	BAR	LENGTH
15" Ø	19.5"	E1	3'-8"
18" Ø	23.0"	E2	4'-0"
30" Ø	37.0"	E3	5'-2"
36" Ø	44.0"	E4	5'-9"

TOTAL CULVERT #1 QUANTITIES

PAY ITEM	PHASE 1A C1-P1A	PHASE 1B C1-P1B	TOTAL
CLASS A CONCRETE			
BARREL @ 0.840 CY/FT	1134.8 C.Y.	37.0 C.Y.	1171.8 C.Y.
WINGS ETC.		13.0 C.Y.	13.0 C.Y.
SUBTOTAL	1134.8 C.Y.	50.0 C.Y.	1184.8 C.Y.
REINFORCING STEEL			
BARREL	172,429 LBS.	5,978 LBS.	178,407 LBS.
WINGS ETC.		749 LBS.	749 LBS.
SUBTOTAL	172,429 LBS.	6,727 LBS.	179,156 LBS.
CULVERT EXCAVATION	LUMP SUM	LUMP SUM	LUMP SUM
FOUNDATION COND. MAT'L	1270 TONS	41 TONS	1311 TONS

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 478+64.40 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
BARREL STANDARD

CULVERT #1
SINGLE 8' X 7' RCBC
C1-P1A & C1-P1B
OFFSET 106.48' LEFT

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSILING FANG

DocuSigned by: Ting Fang E72085400977435... 8/16/2016

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REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		C-2
1			3				TOTAL SHEETS
2			4				34

DRAWN BY : A. SORSENGINH DATE : 1/2016
CHECKED BY : T. H. FANG DATE : 5/15/16
DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 5/26/16

16-AUG-2016 11:11
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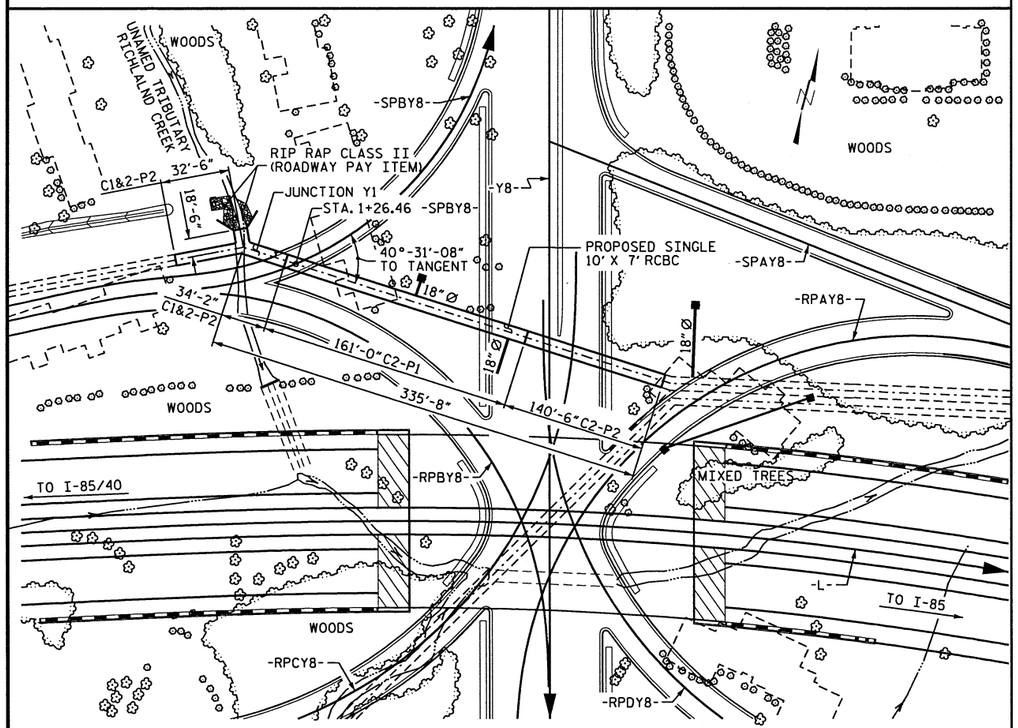
tfang

CUL #1

BM #18: RR SPIKE IN 22"OAK, STA. 10+00.00 -Y8-, N 18° 44' 24.6"W, DIST. 575.94', EL. 808.40'



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 390 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YRS.
DESIGN HIGH WATER ELEVATION	= 771.70
DRAINAGE AREA	= 0.38 SQ. MI.
BASE DISCHARGE (Q100)	= 410 CFS
BASE HIGH WATER ELEVATION	= 771.88

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= >470+ CFS
FREQUENCY OF OVERTOPPING FLOOD	= >500+ YRS.
OVERTOPPING FLOOD ELEVATION	= 777.83

GRADE DATA

GRADE POINT ELEVATION @ STA. 1+26.46 -SPBY8-	= 778.54'
BED ELEVATION @ STA. 1+26.46 -SPBY8-	= 765.14'
ROADWAY FILL SLOPES	= 4:1

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE

PHASE C2-P1	152.0	C.Y.
PHASE C2-P2	132.6	C.Y.
PHASE C1&2-P2	82.2	C.Y.
TOTAL	366.8	C.Y.

REINFORCING STEEL

PHASE C2-P1	23,748	LBS.
PHASE C2-P2	20,521	LBS.
PHASE C1&2-P2	12,283	LBS.
TOTAL	56,552	LBS.

FOUNDATION COND. MATERIAL

PHASE C2-P1	174	TONS
PHASE C2-P2	152	TONS
PHASE C1&2-P2	82	TONS
TOTAL	408	TONS

CULVERT EXCAVATION (TOTAL) LUMP SUM

F.A. PROJECT NO. NHF-0708(53)

NOTES:

ASSUMED LIVE LOAD ---------- HL-93 OR ALTERNATE LOADING.

DESIGN FILL MAXIMUM ------ 6.99 FT.

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4"OF ALL VERTICAL WALLS.

2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

AT THE CONTRACTORS OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

ALL PIPES THROUGH THE SIDEWALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPE.

FOR CULVERT DIVERSION DETAILS & PAY ITEM, SEE EROSION CONTROL PLANS.

FOR CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.

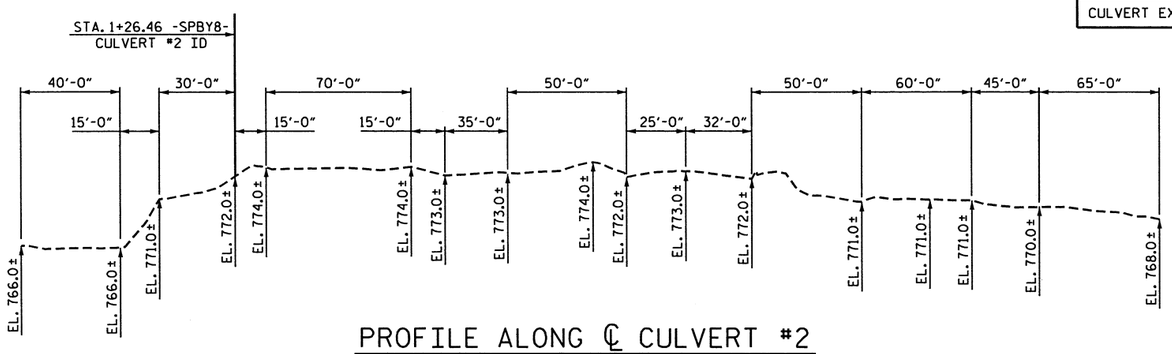
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.



PROFILE ALONG ℄ CULVERT #2

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 1+26.46 -SPBY8-

SHEET 1 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT #2
SINGLE 10' X 7' RCBC
C2-P1, C2-P2 & C1&2-P2
40°-31'-08" SKEW

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

DocuSigned by: Ting Fang E72068400977435... 8/16/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-7
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : A. SORSENGINH DATE : 1/2016
CHECKED BY : T. H. FANG DATE : 5/15/16
DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 5/26/16

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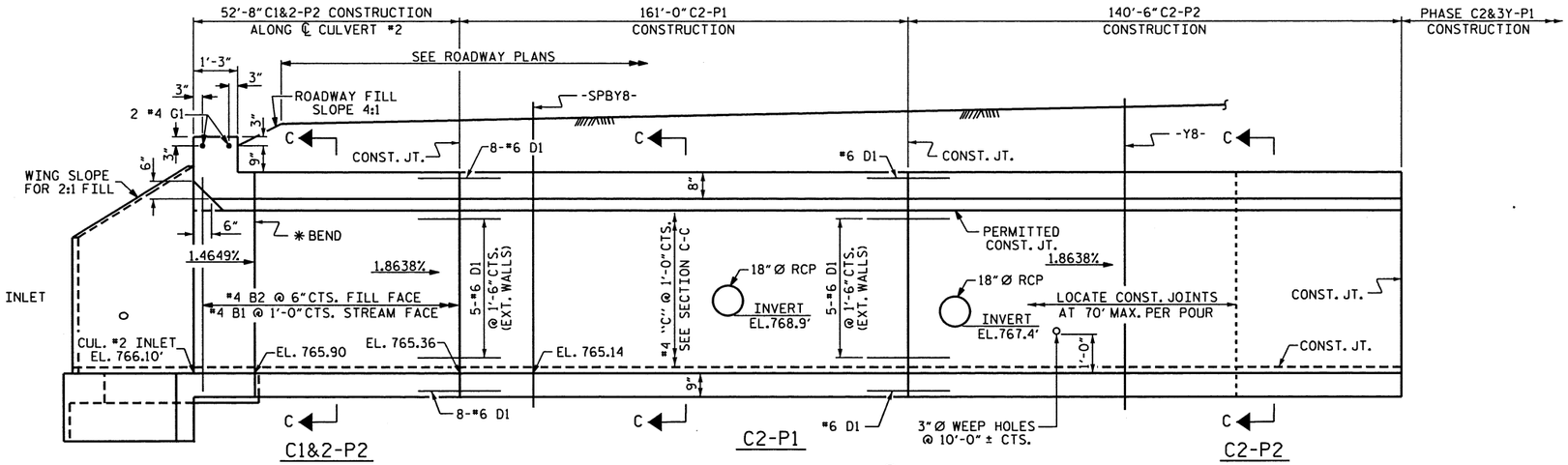
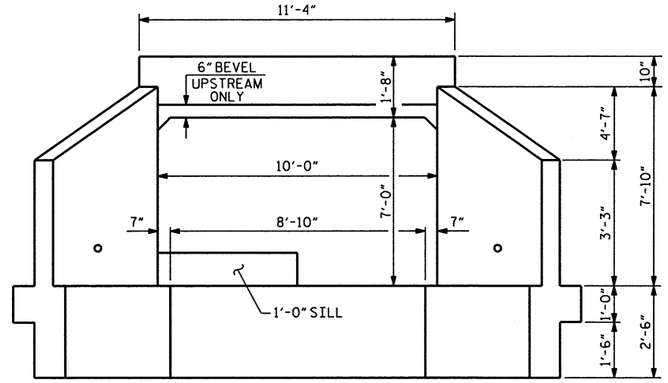
tfang

CUL #2



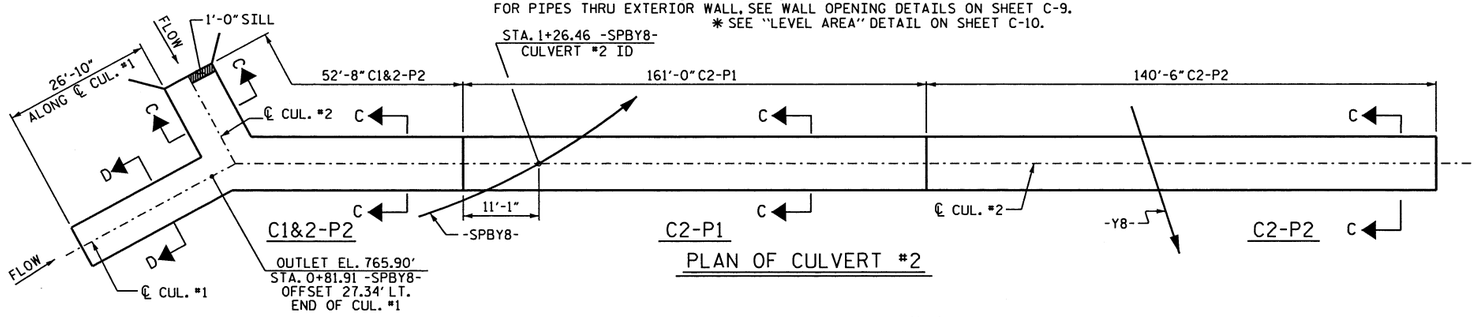
CULVERT SECTION ALONG ℄ CULVERT

PORTION OF CUL #1 ON PHASE C1&2-P2 NOT SHOWN FOR CLARITY.
FOR PIPES THRU EXTERIOR WALL, SEE WALL OPENING DETAILS ON SHEET C-9.
* SEE "LEVEL AREA" DETAIL ON SHEET C-10.

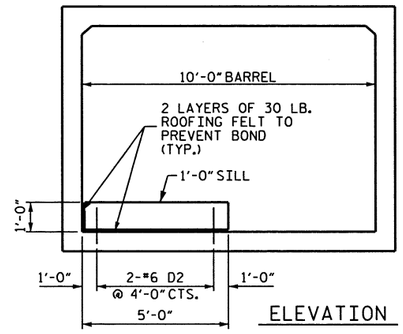


INLET END ELEVATION

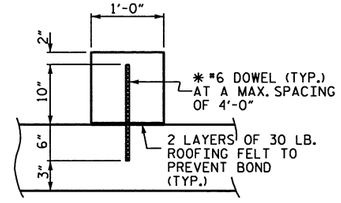
LOOKING DOWN STREAM



PLAN OF CULVERT #2

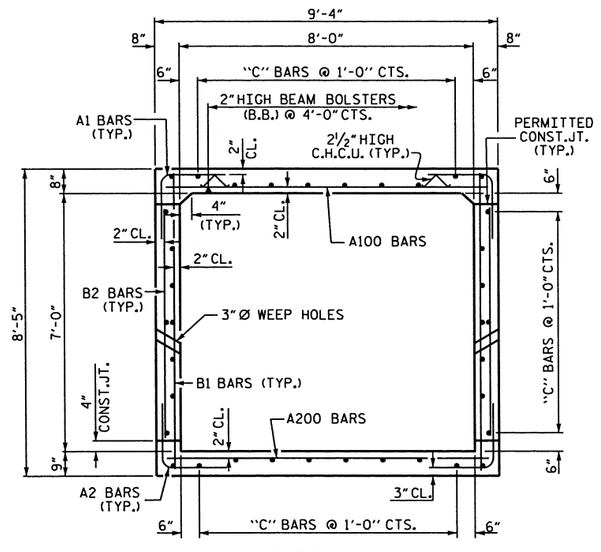


ELEVATION



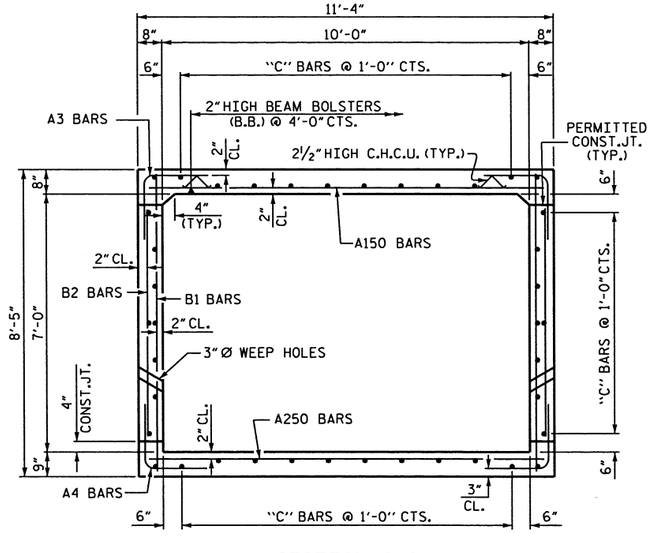
SECTION THROUGH SILL

CULVERT SILL DETAILS



SECTION D-D

THERE ARE 36 "C" BARS IN BARREL SECTION FOR CULVERT #1



SECTION C-C

THERE ARE 40 "C" BARS IN BARREL SECTION FOR CULVERT #2

TOTAL CULVERT #2 QUANTITIES

PAY ITEM	PHASE I C2-P1	PHASE II C2-P2	PHASE II C1&2-P2	TOTAL
CLASS A CONCRETE				
BARREL @ 0.944 CY/FT	152.0 C.Y.	132.6 C.Y.	72.6 C.Y.	357.2 C.Y.
WINGS ETC.			9.6 C.Y.	9.6 C.Y.
SUBTOTAL	152.0 C.Y.	132.6 C.Y.	82.2 C.Y.	366.8 C.Y.
REINFORCING STEEL				
BARREL	23,748 LBS.	20,521 LBS.	11,707 LBS.	55,976 LBS.
WINGS ETC.			576 LBS.	576 LBS.
SUBTOTAL	23,748 LBS.	20,521 LBS.	12,283 LBS.	56,552 LBS.
CULVERT EXCAVATION	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM
FOUNDATION COND. MAT'L	174 TONS	152 TONS	82 TONS	408 TONS

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING H. FANG

DocuSigned by: Ting Fang E720884009774 35... 8/16/2016

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 1+26.46 -SPBY8-
SHEET 2 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT #2
SINGLE 10' X 7' RCBC
C2-P1, C2-P2 & C1&2-P2

40°-31'-08" SKEW

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		C-8
1			3				TOTAL SHEETS
2			4				34

DRAWN BY : A. SORSENGINH DATE : 1/2016
CHECKED BY : T. H. FANG DATE : 5/15/16
DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 5/26/16

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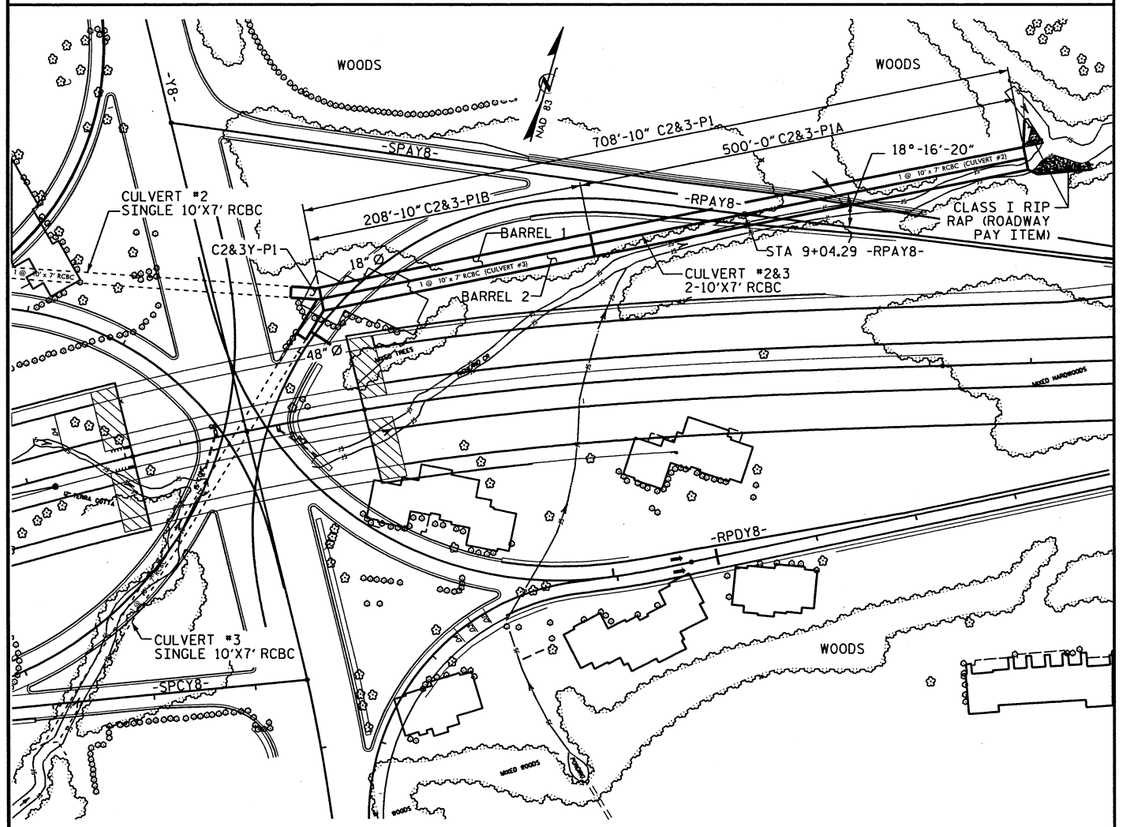
tfang

CUL #2

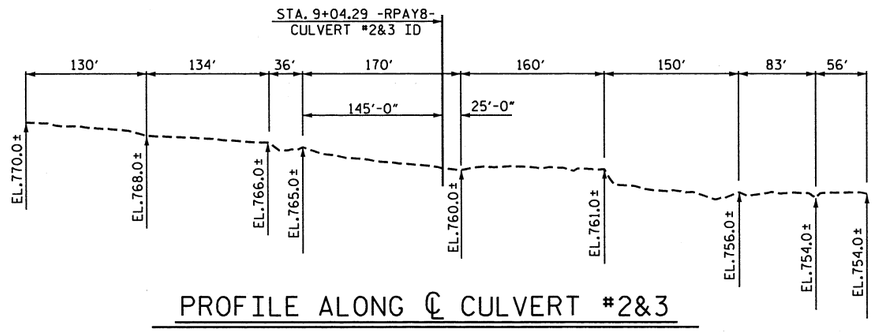
F.A. PROJECT NO. NHF-0708(53)

BM #18: RR SPIKE SET IN 22"OAK, STA. 10+00 -Y8-, N 18° 44' 24.6"W 575.94', EL. 808.40'



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH



PROFILE ALONG ℄ CULVERT #2&3

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

CULVERT #2&3

GRADE DATA

GRADE POINT ELEVATION @ STA. 9+04.29 -RPAY8-	= 786.82'
BED ELEVATION @ STA. 9+04.29 -RPAY8-	= 757.0'
ROADWAY FILL SLOPES	= 2:1

BARREL 1 - CULVERT #2

HYDRAULIC DATA

DESIGN DISCHARGE	= 390 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YRS.
DESIGN HIGH WATER ELEVATION	= 771.70
DRAINAGE AREA	= 0.38 SQ. MI.
BASE DISCHARGE (Q100)	= 410 CFS
BASE HIGH WATER ELEVATION	= 771.88

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= >470+ CFS
FREQUENCY OF OVERTOPPING FLOOD	= >500+ YRS.
OVERTOPPING FLOOD ELEVATION	= 777.83

GRADE DATA

GRADE POINT ELEVATION @ STA. 1+26.46 -SPBY8-	= 778.54'
BED ELEVATION @ STA. 1+26.46 -SPBY8-	= 765.14'
ROADWAY FILL SLOPES	= 4:1

BARREL 2 - CULVERT #3

HYDRAULIC DATA

DESIGN DISCHARGE	= 712 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YRS.
DESIGN HIGH WATER ELEVATION	= 772.00
DRAINAGE AREA	= 1.12 SQ. MI.
BASE DISCHARGE (Q100)	= 902 CFS
BASE HIGH WATER ELEVATION	= 773.64

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 1100 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 100+ YRS.
OVERTOPPING FLOOD ELEVATION	= 777.39

GRADE DATA

GRADE POINT ELEVATION @ STA. 2+22.93 -SPCY8-	= 777.95'
BED ELEVATION @ STA. 2+22.93 -SPCY8-	= 762.42'
ROADWAY FILL SLOPES	= 2:1

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE		
PHASE C2&3-P1	2,014.1	C.Y.
PHASE C2&3Y-P1	81.1	C.Y.
TOTAL	2,095.2	C.Y.
REINFORCING STEEL		
PHASE C2&3-P1	203,135	LBS.
PHASE C2&3Y-P1	13,025	LBS.
TOTAL	216,160	LBS.
FOUNDATION COND. MATERIAL		
PHASE C2&3-P1	1,300	TONS
PHASE C2&3Y-P1	87	TONS
TOTAL	1,387	TONS
CULVERT EXCAVATION (TOTAL)	LUMP SUM	

NOTES

ASSUMED LIVE LOAD ----------HL-93 OR ALTERNATE LOADING.

DESIGN FILL MAX./MIN. ---------- 25'/8'

FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTE SHEET.

3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTING AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS, AND WING FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALL.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FEET. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

ALL PIPES THROUGH THE SIDEWALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPE.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROLS PLANS.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT AT WING 2 AND AT THE JOINT BETWEEN WING 1 AND RETAINING WALL #18.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

FOR CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.

DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR CONSTRUCTION OF C2&3-P1A SHALL BE SUBMITTED. SEE SHEET SN.

RETAINING WALL #18 CONSTRUCTION SEQUENCE

STEP 1: RETAINING WALL #18 FROM STA. 6+35.81 -RPAY8- (OFFSET 77.76' RT.) TO STA. 6+26.35 -RPAY8- (OFFSET 73.0' RT.) SHALL BE CONSTRUCTED DURING PHASE I.

STEP 2: RETAINING WALL #18 FROM STA. 6+26.35 -RPAY8- (OFFSET 73.0' RT.) TO STA. 5+73.18 -RPAY8- (OFFSET 86.09' RT.) SHALL BE CONSTRUCTED DURING PHASE IV AT A TIME WHEN TEMPORARY CHANNEL #1 IS NO LONGER NEEDED AND HAS BEEN REMOVED.

CULVERT #2&3 IS A COMBINATION OF CULVERTS #2 & #3 FROM TWO SINGLE BARRELS TO ONE DOUBLE BARREL

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 9+04.29 -RPAY8-

SHEET 1 OF 9 STR. #1223

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT #2&3
DOUBLE 10' X 7' RCBC
C2&3-P1 & C2&3Y-P1
18°-16'-20" SKEW

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

DocuSigned by: Ting Fang 8/16/2016 E720B400977436...

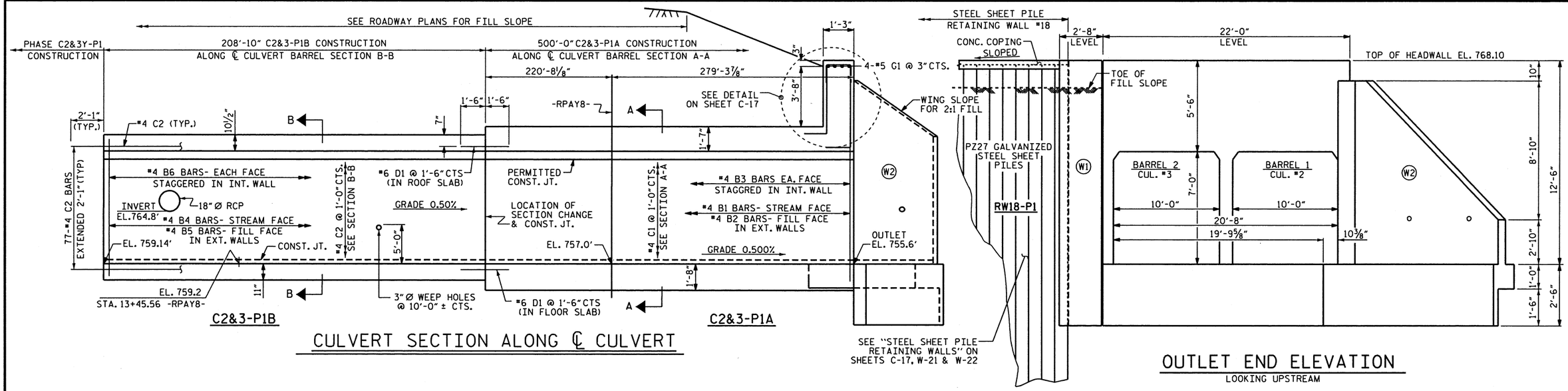
ASSEMBLED BY : E.I. OMILE	DATE : 4/14	SPECIAL
CHECKED BY : T. H. FANG	DATE : 6/6/16	
DRAWN BY : R.W. WRIGHT	DATE : JULY, 1990	STANDARD
CHECKED BY : D.A. GLADDEN	DATE : JULY, 1990	

ADDED NOV. 1, 1990

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-14
1			3			TOTAL SHEETS
2			4			34

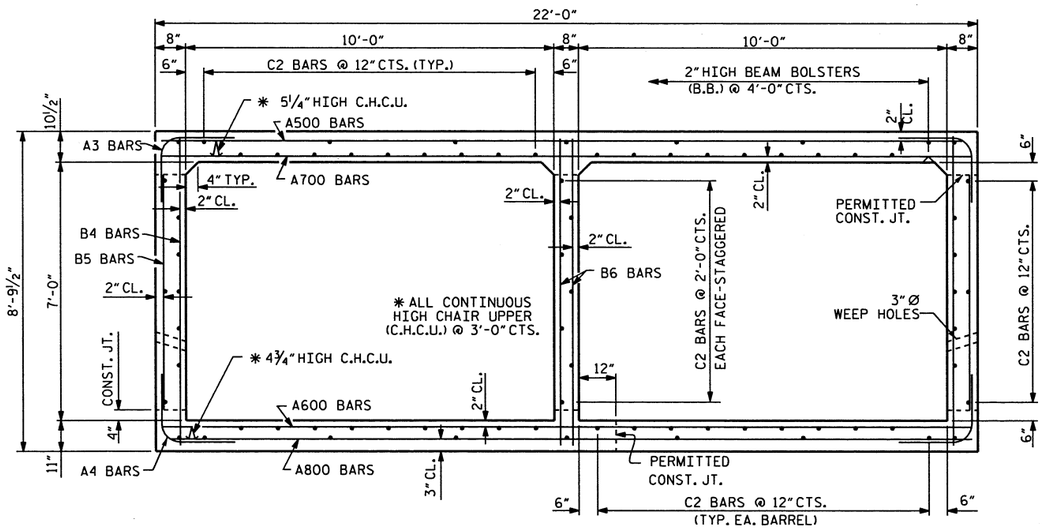
CUL #2&3



CULVERT SECTION ALONG ℄ CULVERT

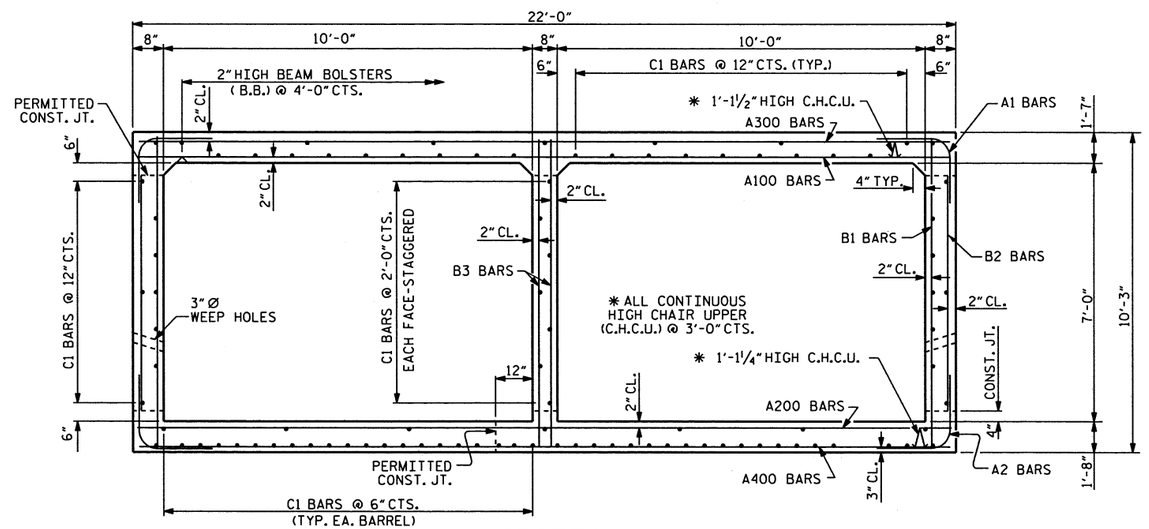
OUTLET END ELEVATION

LOOKING UPSTREAM



SECTION B-B

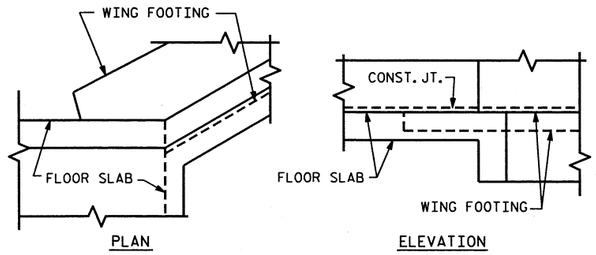
THERE ARE 77 C2 BARS IN SECTION OF BARREL.



SECTION A-A

THERE ARE 99 C1 BARS IN SECTION OF BARREL.

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



CONNECTION OF WING FOOTING & FLOOR SLAB

FOR SECTION A-A, THE FLOOR SLAB IS THICKER THAN FOOTING

TOTAL CULVERT C2&3-P1 QUANTITIES

ITEM	C2&3-P1A	C2&3-P1B	TOTAL C2&3-P1
CLASS A CONCRETE			
BARREL & MISC ITEMS *	1,599.2 C.Y.	414.9 C.Y.	2,014.1 C.Y.
WING (W2)	8.0 C.Y.	--	8.0 C.Y.
SUBTOTAL	1,607.2 C.Y.	414.9 C.Y.	2,022.1 C.Y.
REINFORCING STEEL			
BARREL & MISC. ITEM *	151,350 LBS.	51,260 LBS.	202,610 LBS.
WING (W2)	525 LBS.	--	525 LBS.
SUBTOTAL	151,875 LBS.	51,260 LBS.	203,135 LBS.
CULVERT EXCAVATION	LUMP SUM	LUMP SUM	LUMP SUM
FOUNDATION COND. MAT'L	917 TONS	383 TONS	1,300 TONS

* MISC. ITEMS' QUANTITY INCLUDE HEADWALL, CURTAIN WALL, WING W1, AND COPING.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG

DocuSigned by: Ting Fang 8/16/2016

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 9+04.29 -RPAY8-

SHEET 2 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
BARREL STANDARD

CULVERT #2&3 DOUBLE 10' X 7' RCBC C2&3-P1A & C2&3-P1B

18°-16'-20" SKEW

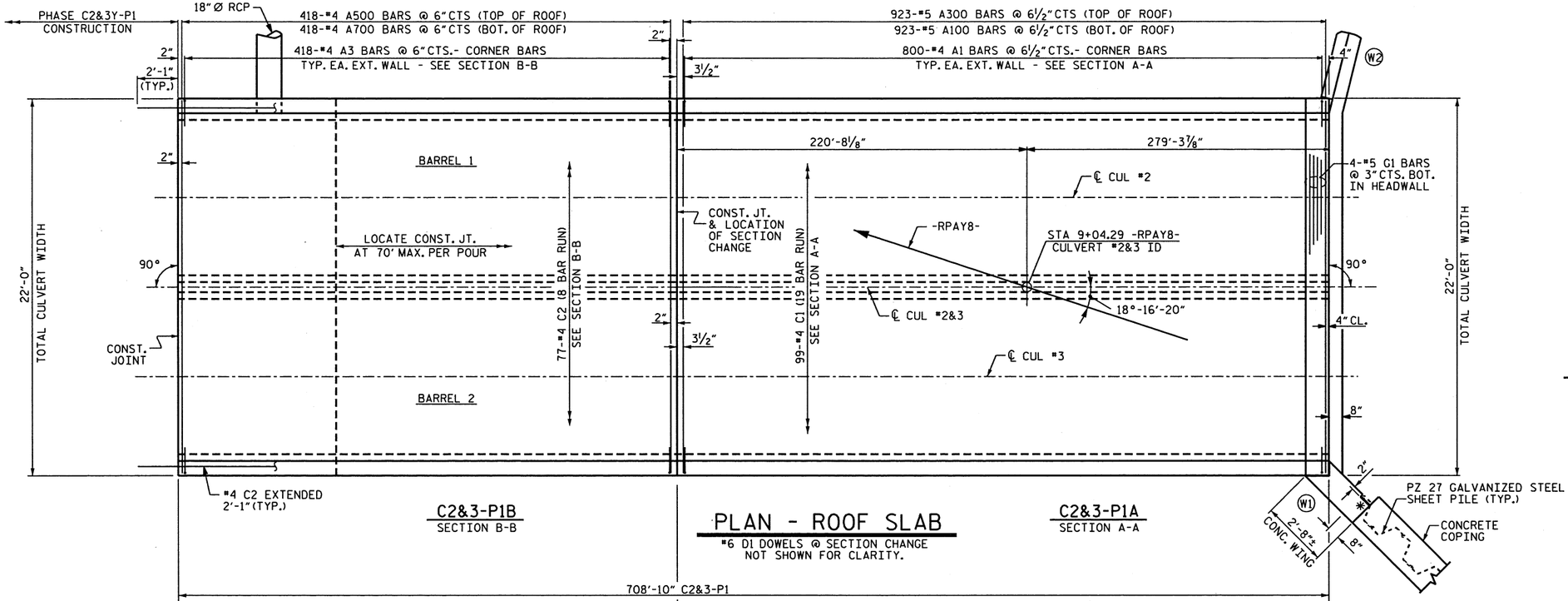
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-15
1			3			TOTAL SHEETS
2			4			34

CUL #2&3

ASSEMBLED BY : M. SHAHIDI	DATE : 6/8/16	SPECIAL
CHECKED BY : T. H. FANG	DATE : 7/6/16	
DRAWN BY : RALPH D. UNDERWOOD	DATE : MAY 1971	STANDARD
CHECKED BY : JOEL A. JOHNSON	DATE : JULY 1971	

REVISED 11-19-99 BY M.M. CHECKED BY R.M.W.
REDRAWN NOV. 1990 BY TSS CHECKED BY ARB

16-AUG-2016 11:04
K:\TIPProjects-U\U2524D\Structures\Plans\culvert\u2524d_sc
ttfang



Ting Fang 8/16/2016

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 9+04.29 -RPAY8-

SHEET 3 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

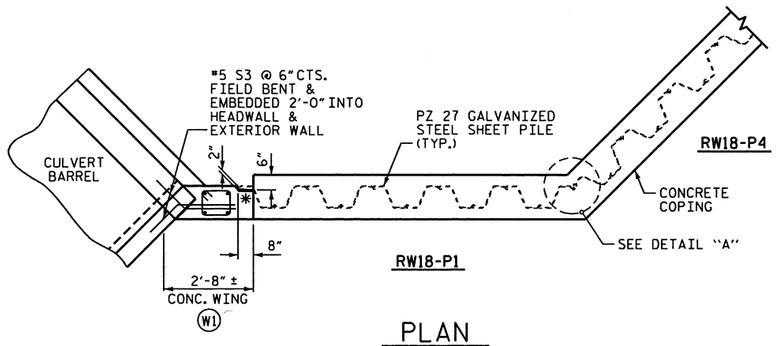
CULVERT #2&3
DOUBLE 10' X 7' RCBC
C2&3-P1A & C2&3-P1B
18°-16'-20" SKEW

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		C-16
1			3				TOTAL SHEETS
2			4				34

DRAWN BY : E. I. OMILE DATE : 3/25/14
CHECKED BY : T. H. FANG DATE : 6/21/16
DESIGN ENGINEER OF RECORD: P. K. NEWTON DATE : 7/13/16

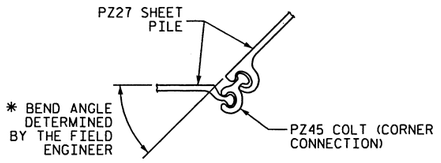
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CUL #2&3

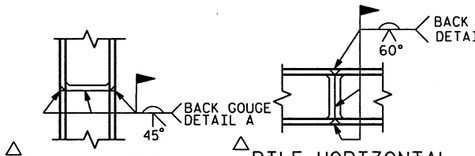


PLAN

* 2"x 8"NOTCH WITH 1"EXPANSION MATERIAL BETWEEN STEEL SHEET PILE AND CONCRETE WING

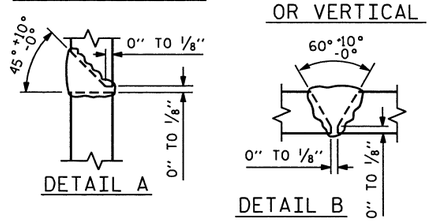


DETAIL "A"



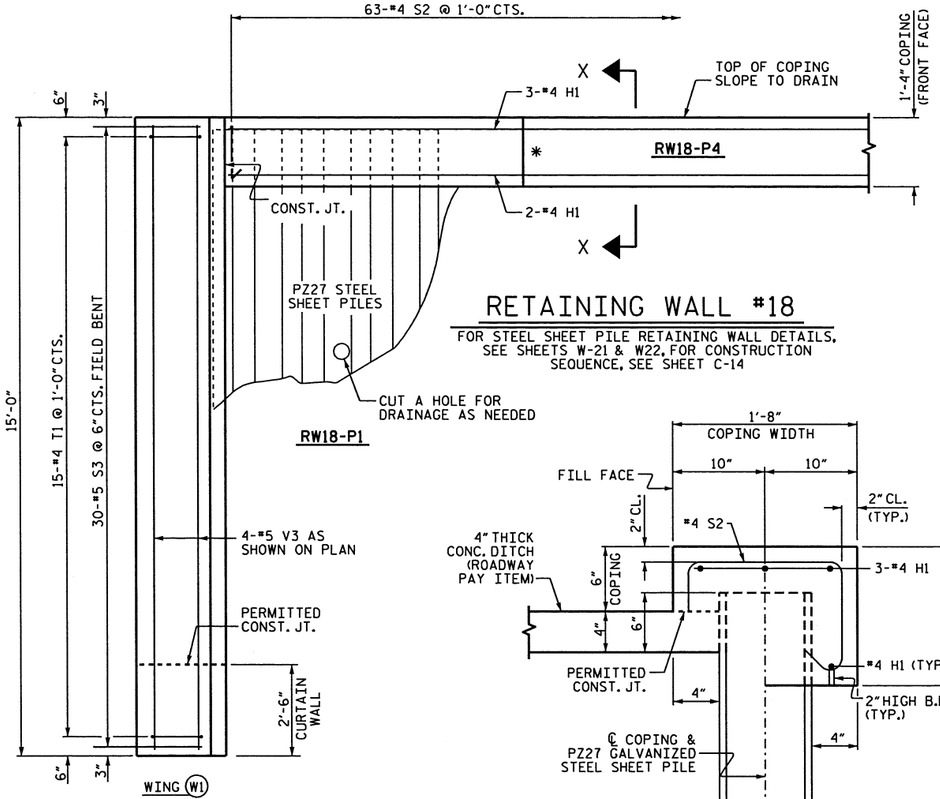
△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



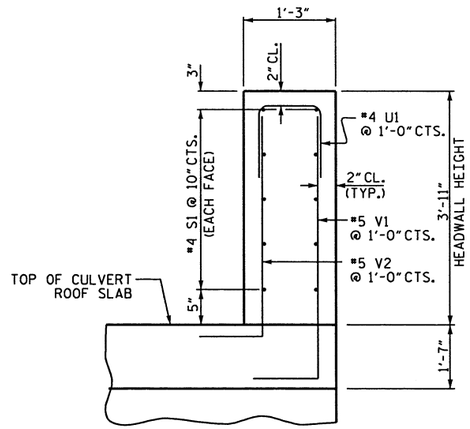
RETAINING WALL #18

FOR STEEL SHEET PILE RETAINING WALL DETAILS, SEE SHEETS W-21 & W22. FOR CONSTRUCTION SEQUENCE, SEE SHEET C-14

ELEVATION

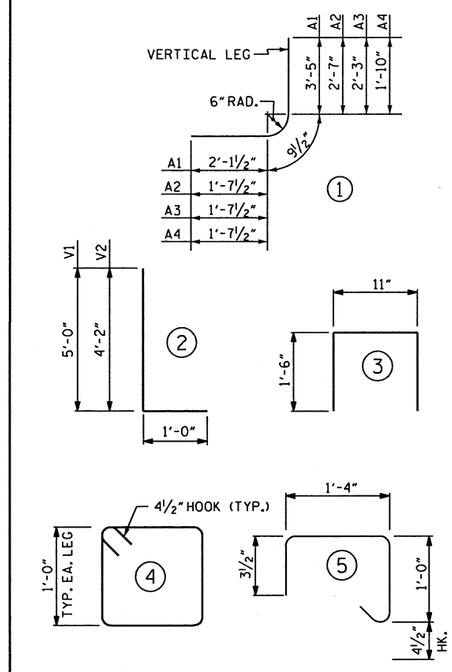
SECTION X-X

CONCRETE COPING DETAILS



SECTION THRU HEADWALL

BAR TYPE



BAR DIMENSIONS ARE OUT TO OUT

SPLICE LENGTHS CHART

BAR	SIZE	SPLICE LENGTH
"C"	#4	1'-11"

CLASS A CONCRETE QUANTITY FOR MISC. ITEMS

CLASS AA CONCRETE

3'-11" HEADWALL	4.0	C.Y.
CURTAIN WALL	1.3	C.Y.
WING (W1)	2.3	C.Y.
COPING	4.2	C.Y.
TOTAL	11.8	C.Y.

BAR SCHEDULE

PHASE C2&3-P1A CONSTRUCTION

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	1600	#4	1	6'-4"	6,769
A2	1600	#4	1	5'-0"	5,344
A100	923	#5	STR	21'-8"	20,858
A200	800	#5	STR	21'-8"	18,079
A300	923	#5	STR	21'-8"	20,858
A400	800	#6	STR	21'-8"	26,035
B1	1000	#4	STR	9'-11"	6,625
B2	1600	#4	STR	6'-4"	6,769
B3	500	#4	STR	9'-11"	3,312
C1	1881	#4	STR	28'-2"	35,392
D1	48	#6	STR	3'-0"	216
G1	4	#5	STR	21'-8"	90
H1	12	#4	STR	22'-2"	178
S1	10	#4	STR	21'-8"	145
S2	63	#4	5	3'-0"	126
S3	30	#5	STR	4'-6"	141
T1	15	#4	4	4'-9"	38
U1	22	#4	3	3'-11"	58
V1	22	#5	2	6'-0"	138
V2	22	#5	2	5'-2"	119
V3	4	#5	STR	14'-8"	61
REINFORCING STEEL				LBS	** 151,350

PHASE C2&3-P1B CONSTRUCTION

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A3	836	#4	1	4'-8"	2,606
A4	836	#4	1	4'-3"	2,373
A500	418	#4	STR	21'-8"	6,050
A600	418	#4	STR	21'-8"	6,050
A700	418	#4	STR	21'-8"	6,050
A800	418	#5	STR	21'-8"	9,446
B4	418	#4	STR	8'-5"	2,350
B5	836	#4	STR	6'-4"	3,537
B6	209	#4	STR	8'-5"	1,175
C2	616	#4	STR	28'-1"	11,556
E2	16	#4	STR	4'-0"	67
REINFORCING STEEL				LBS	51,260

** QUANTITY INCLUDES HEADWALL, CURTAIN WALL, WING W1 AND COPING.

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 9+04.29 -RPAY8-

SHEET 4 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT #2&3
DOUBLE 10' X 7' RCBC
C2&3-P1 DETAILS
18°-16'-20" SKEW

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSILING FANG

DocuSigned by: Ting Fang E720884009774355... 8/16/2016

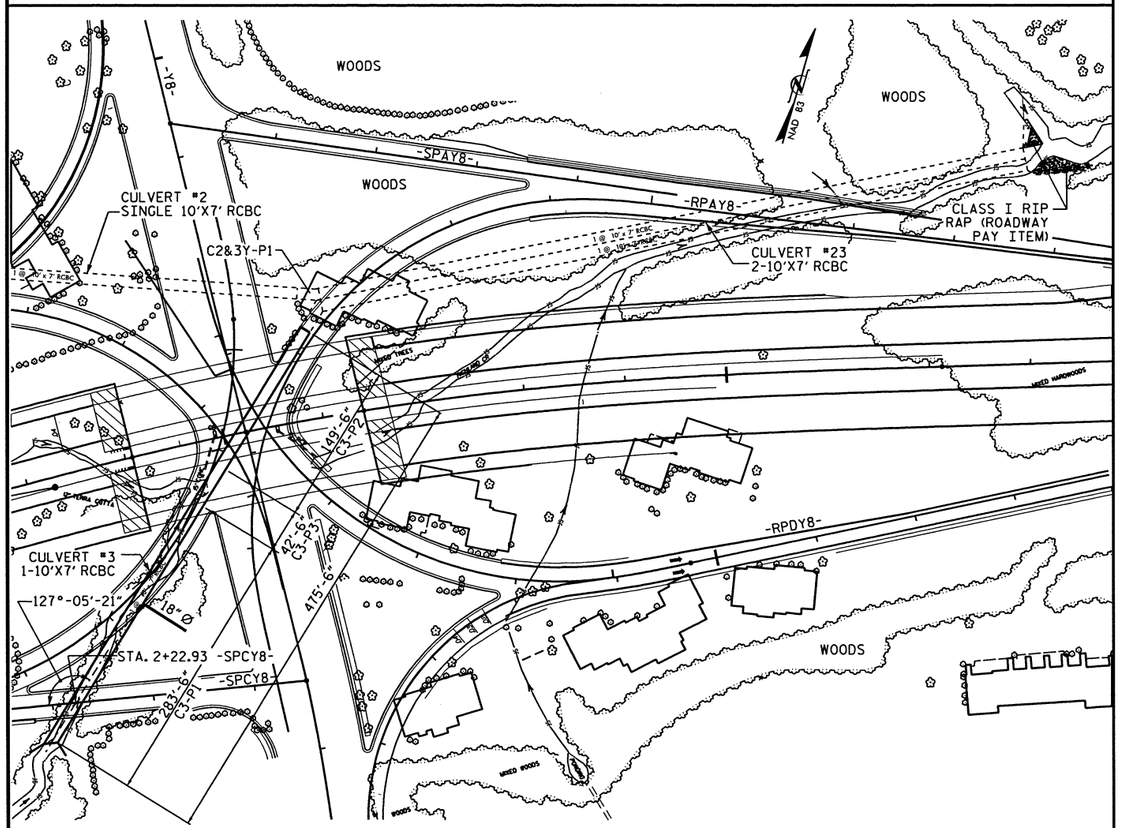
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-17
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : M. SHAHIDI DATE : 7/5/16
CHECKED BY : T. H. FANG DATE : 7/6/16
DESIGN ENGINEER OF RECORD: P. K. NEWTON DATE : 7/13/16

17-AUG-2016 10:06
K:\TIPProjects-U\U2524D\Structures\Plans\culvert\u2524d_sc
tfang

BM #19: RR SPIKE SET IN 18" OAK, STA. 31+26 -Y8-, S 22° 19' 57.9"E DIST. 312.72', EL. 841.27'



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 712 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YRS.
DESIGN HIGH WATER ELEVATION	= 772.00
DRAINAGE AREA	= 1.12 SQ. MI.
BASE DISCHARGE (Q100)	= 902 CFS
BASE HIGH WATER ELEVATION	= 773.64

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 1100 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 100+ YRS.
OVERTOPPING FLOOD ELEVATION	= 777.39

GRADE DATA

GRADE POINT ELEVATION @ STA. 2+22.93 -SPCY8-	= 777.95'
BED ELEVATION @ STA. 2+22.93 -SPCY8-	= 762.42'
ROADWAY FILL SLOPES	= 2:1

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE

PHASE C3-P1	288.7	C.Y.
PHASE C3-P2	146.4	C.Y.
PHASE C3-P3	41.6	C.Y.
TOTAL	476.7	C.Y.

REINFORCING STEEL

PHASE C3-P1	44,082	LBS.
PHASE C3-P2	22,723	LBS.
PHASE C3-P3	6,426	LBS.
TOTAL	73,231	LBS.

FOUNDATION COND. MATERIAL

PHASE C3-P1	307	TONS
PHASE C3-P2	162	TONS
PHASE C3-P3	46	TONS
TOTAL	514	TONS

CULVERT EXCAVATION (TOTAL) LUMP SUM

NOTES

F.A. PROJECT NO. NHF-0708(53)

ASSUMED LIVE LOAD ----------HL-93 OR ALTERNATE LOADING.

DESIGN FILL ---------- 8.80'

FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTE SHEET.

3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTING AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS, AND WING FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALL.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FEET. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

ALL PIPES THROUGH THE SIDEWALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPE.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROLS PLANS.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

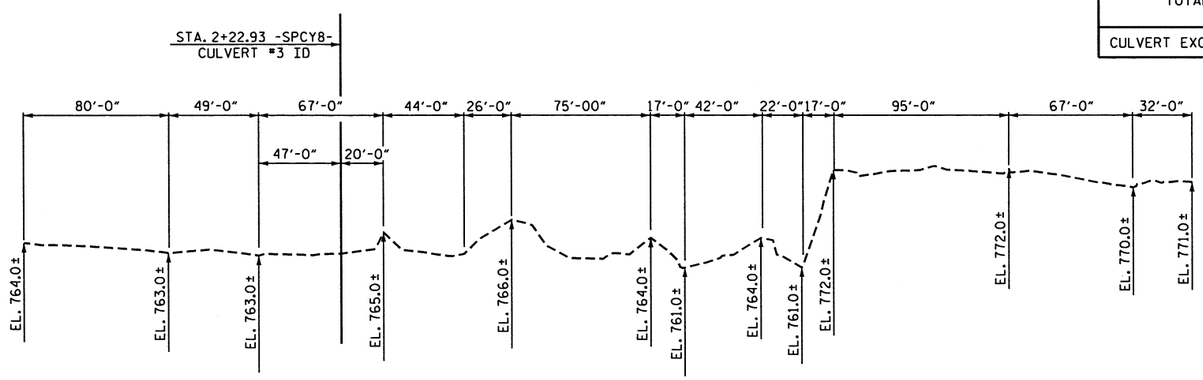
FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

FOR CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



PROFILE ALONG ℄ CULVERT #3

PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 2+22.93 -SPCY8-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT #3
SINGLE 10' X 7' RCBC
C3-P1, C3-P2 & C3-P3
127° -05'-21" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-23
1			3			TOTAL SHEETS
2			4			34

CUL #3

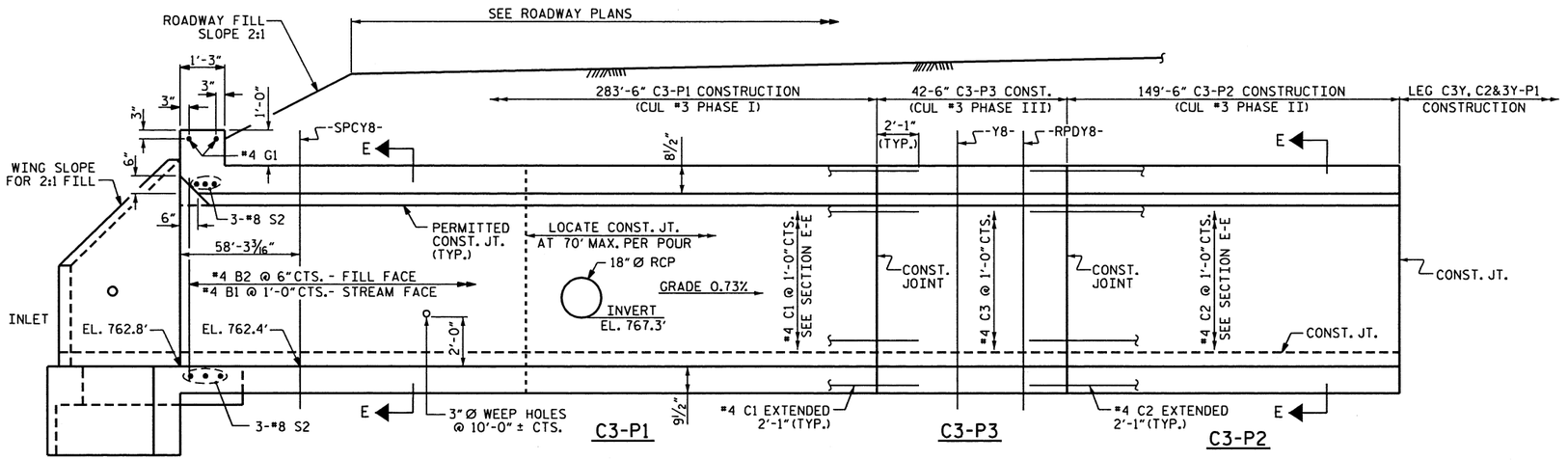
STD. NO. CB12A

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG

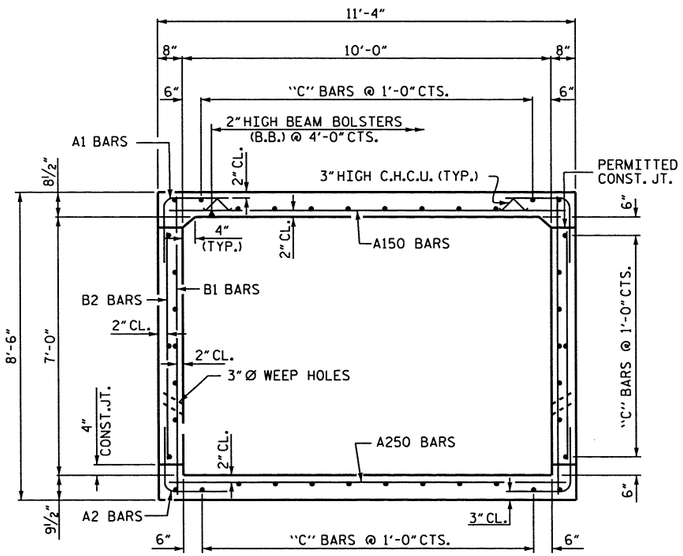
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : E.I. OMILE	DATE : 4/14	SPECIAL
CHECKED BY : T. H. FANG	DATE : 6/6/16	
DRAWN BY : R.W. WRIGHT	DATE : JULY, 1990	STANDARD
CHECKED BY : D.A. GLADDEN	DATE : JULY, 1990	

ADDED NOV. 1, 1990



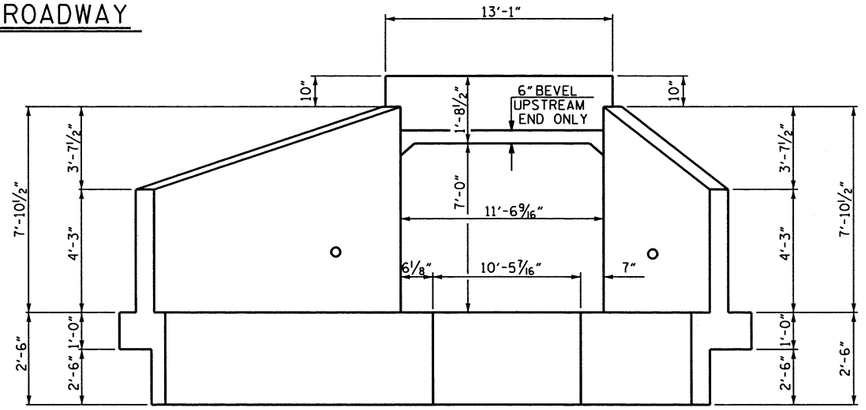
CULVERT SECTION NORMAL TO ROADWAY



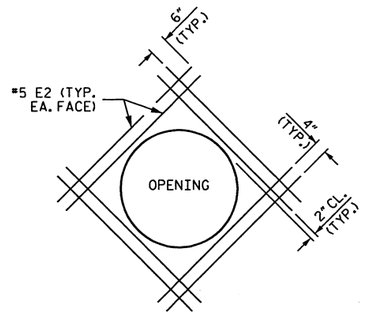
SECTION E-E

THERE ARE 40 "C" BARS IN SECTION OF BARREL

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



INLET END ELEVATION NORMAL TO SKEW



WALL OPENING DETAILS

FOR 18"Ø PIPE THRU EXTERIOR WALL
FIELD CUT & BEND "B" & "C" BARS AS NEEDED TO CLEAR PIPE

BAR SCHEDULE

PHASE C3-P2 CONSTRUCTION

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	598	#4	1	5'-8"	2264
A2	598	#4	1	5'-4"	2131
A150	299	#6	STR	11'-0"	4940
A250	299	#6	STR	11'-0"	4940
B1	300	#4	STR	8'-0"	1603
B2	598	#4	STR	6'-4"	2530
C2	240	#4	STR	26'-11"	4315
REINFORCING STEEL = 22,723 LBS.					

PHASE C3-P1 CONSTRUCTION

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	1131	#4	1	5'-8"	4281
A2	1131	#4	1	5'-4"	4029
A150	561	#6	STR	11'-0"	9269
A151	2	#6	STR	9'-0"	27
A152	2	#6	STR	7'-4"	22
A153	2	#6	STR	5'-7"	17
A154	2	#6	STR	3'-10"	12
A250	561	#6	STR	11'-0"	9269
A251	2	#6	STR	9'-0"	27
A252	2	#6	STR	7'-4"	22
A253	2	#6	STR	5'-7"	17
A254	2	#6	STR	3'-10"	12
B1	575	#4	STR	8'-0"	3073
B2	1146	#4	STR	6'-4"	4848
C1	440	#4	STR	28'-0"	8230
E2	16	#5	STR	4'-0"	67
G1	2	#4	STR	12'-7"	17
S2	6	#8	STR	12'-7"	202
REINFORCING STEEL = 43,441 LBS.					

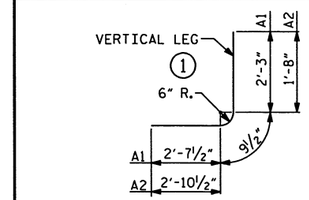
PHASE C3-P3 CONSTRUCTION

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	170	#4	1	5'-8"	644
A2	170	#4	1	5'-4"	606
A150	85	#6	STR	11'-0"	1404
A250	85	#6	STR	11'-0"	1404
B1	86	#4	STR	8'-0"	460
B2	170	#4	STR	6'-4"	719
C3	80	#4	STR	22'-3"	1189
REINFORCING STEEL = 6,426 LBS.					

SPLICE LENGTHS CHART

BAR	SIZE	SPLICE LENGTH
"C"	#4	1'-11"

BAR TYPE



BAR DIMENSIONS ARE OUT TO OUT

TOTAL CULVERT #3 QUANTITIES

ITEM	C3-P1 PHASE I	C3-P2 PHASE II	C3-P3 PHASE III	TOTAL
CLASS A CONCRETE				
BARREL @ 0.979 CY/FT	277.6 C.Y.	146.4 C.Y.	41.6 C.Y.	465.6 C.Y.
WINGS ETC.	11.1 C.Y.	--	--	11.1 C.Y.
SUBTOTAL	288.7 C.Y.	146.4 C.Y.	41.6 C.Y.	476.7 C.Y.
REINFORCING STEEL				
BARREL & SILLS	43,422 LBS.	22,723 LBS.	6,426 LBS.	72,571 LBS.
WINGS ETC.	660 LBS.	--	--	660 LBS.
SUBTOTAL	44,082 LBS.	22,723 LBS.	6,426 LBS.	73,231 LBS.
CULVERT EXCAVATION	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM
FOUNDATION COND. MAT'L	307 TONS	162 TONS	46 TONS	514 TONS

REVISED 11-19-99 BY MAW. CHECKED BY R.W.W.
REDRAWN NOV. 1990 BY TSS CHECKED BY ARB

ASSEMBLED BY : M. SHAHIDI	DATE : 6/2/16	SPECIAL
CHECKED BY : T. H. FANG	DATE : 7/6/16	
DRAWN BY : RALPH D. UNDERWOOD	DATE : MAY 1971	STANDARD
CHECKED BY : JOEL A. JOHNSON	DATE : JULY 1971	

DocuSigned by: Ting Fang 8/16/2016 E72C8840097435...

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG

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PROJECT NO. U-2524D
GUILFORD COUNTY
STATION: 2+22.93 -SPCY8-

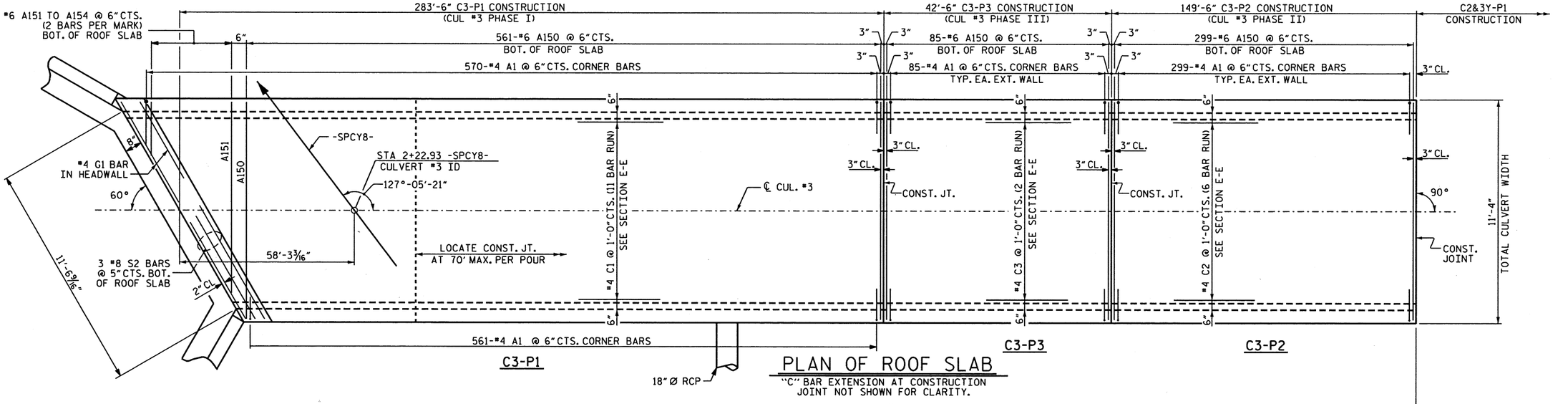
SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
BARREL STANDARD
CULVERT #3
SINGLE 10' X 7' RCBC
C3-P1, C3-P2 & C3-P3
127°-05'-21" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-24
1			3			TOTAL SHEETS
2			4			34

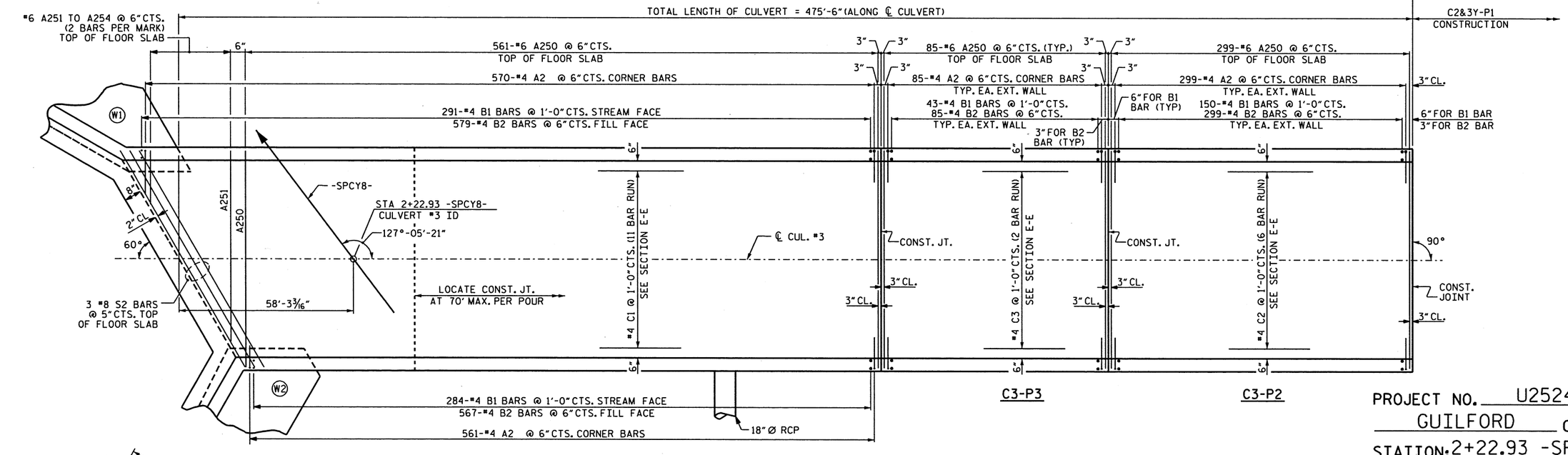
K:\TIPProjects-U\U2524D\Structures\Plans\culvert\u2524d_sd_cul3.dgn
tfang

CUL #3



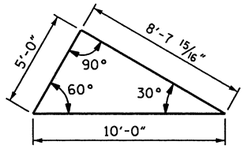
PLAN OF ROOF SLAB

"C" BAR EXTENSION AT CONSTRUCTION JOINT NOT SHOWN FOR CLARITY.



PLAN OF FLOOR SLAB

"C" BAR EXTENSION AT CONSTRUCTION JOINT NOT SHOWN FOR CLARITY.



SKEW TRIANGLE

PROJECT NO. U2524D

GUILFORD COUNTY

STATION: 2+22.93 -SPCY8-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD
CULVERT #3
SINGLE 10' X 7' RCBC
C3-P1, C3-P2 & C3-P3
127°-05'-21" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-25
1			3			TOTAL SHEETS
2			4			34

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSILING FANG

DocuSigned by: Ting Fang E72068400977435... 8/16/2016

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DRAWN BY :	A. SORSENGINH	DATE :	1/2016
CHECKED BY :	T. H. FANG	DATE :	5/15/16
DESIGN ENGINEER OF RECORD:	A. SORSENGINH	DATE :	5/26/16

16-AUG-2016 11:06
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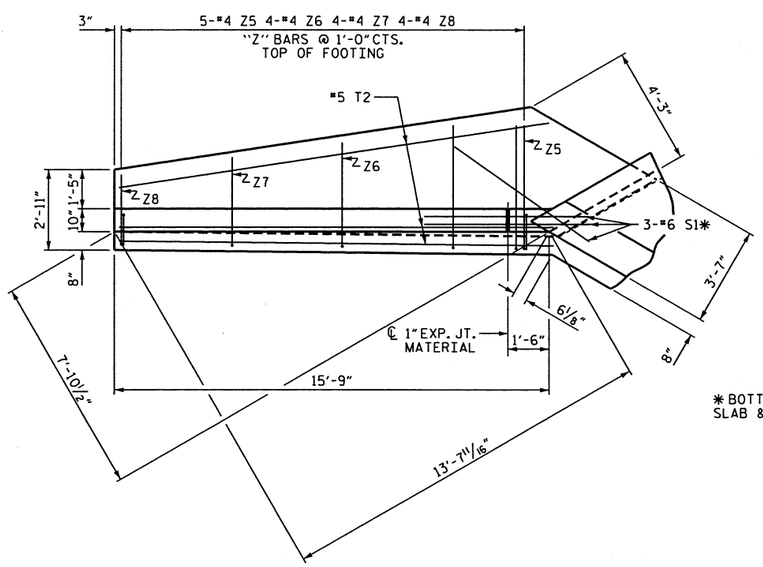
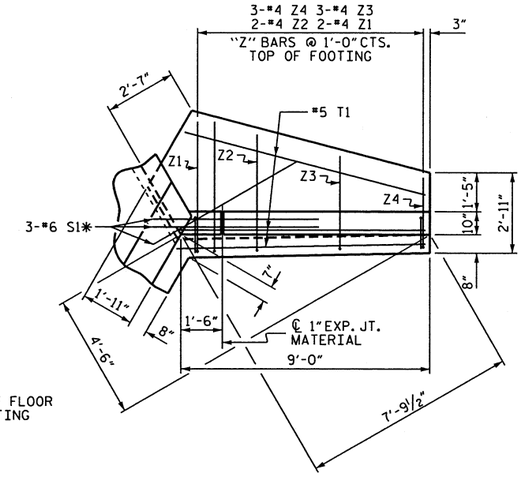
tfang

CUL *3



PLAN W1

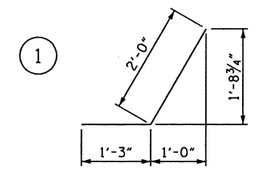


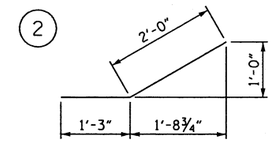
PLAN W2

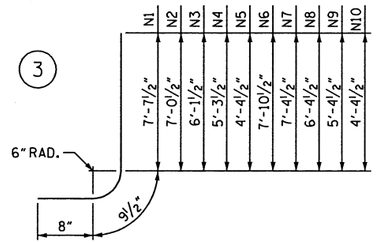
* BOTTOM OF FLOOR SLAB & FOOTING

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.







Z1	4'-9"	6"
Z2	4'-3"	6"
Z3	3'-5"	6"
Z4	2'-7"	6"
Z5	4'-6"	6"
Z6	3'-10"	6"
Z7	3'-3"	6"
Z8	2'-7"	6"

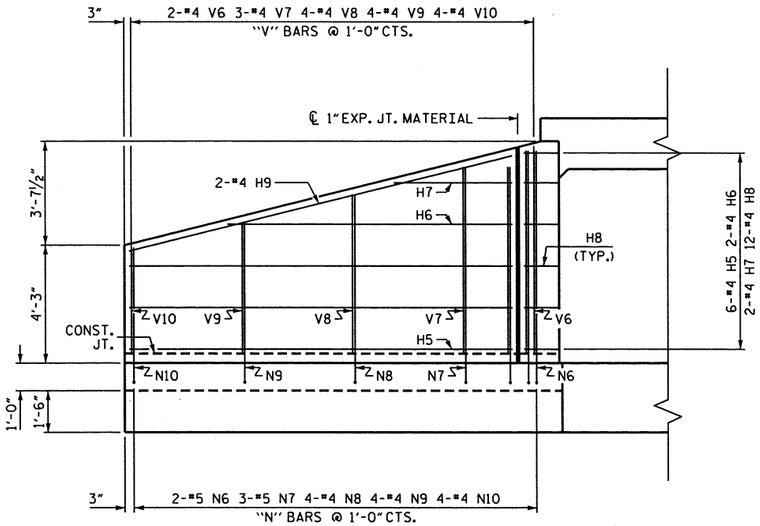
HK.

4

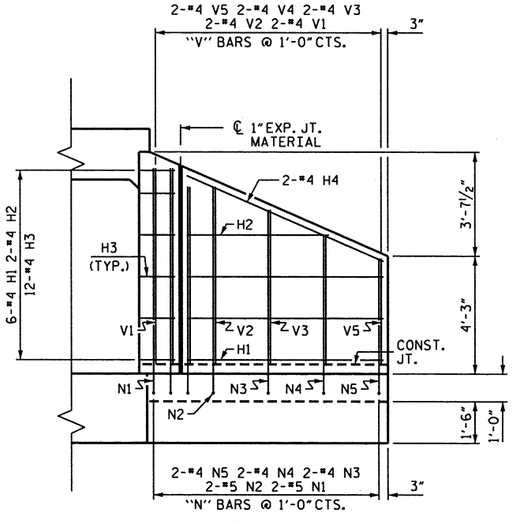
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	7'-1"	28
H2	2	#4	STR	5'-2"	7
H3	12	#4	1	3'-3"	26
H4	2	#4	STR	7'-9"	10
H5	6	#4	STR	13'-10"	55
H6	2	#4	STR	10'-4"	14
H7	2	#4	STR	4'-3"	5
H8	12	#4	2	3'-3"	26
H9	2	#4	STR	14'-3"	19
N1	2	#5	3	9'-1"	19
N2	2	#5	3	8'-6"	18
N3	2	#4	3	7'-7"	10
N4	2	#4	3	6'-9"	9
N5	2	#4	3	5'-10"	8
N6	2	#5	3	9'-4"	19
N7	3	#5	3	8'-10"	28
N8	4	#4	3	7'-10"	21
N9	4	#4	3	6'-10"	18
N10	4	#4	3	5'-10"	16
S1	6	#6	STR	6'-0"	54
T1	3	#5	STR	9'-0"	28
T2	3	#5	STR	15'-9"	49
V1	2	#4	STR	7'-1"	9
V2	2	#4	STR	6'-5"	9
V3	2	#4	STR	5'-7"	7
V4	2	#4	STR	4'-8"	6
V5	2	#4	STR	3'-10"	5
V6	2	#4	STR	7'-4"	10
V7	3	#4	STR	6'-9"	14
V8	4	#4	STR	5'-9"	15
V9	4	#4	STR	4'-9"	13
V10	4	#4	STR	3'-10"	10
Z1	2	#4	4	5'-3"	7
Z2	2	#4	4	4'-9"	6
Z3	3	#4	4	3'-11"	8
Z4	3	#4	4	3'-1"	6
Z5	5	#4	4	5'-0"	17
Z6	4	#4	4	4'-4"	12
Z7	4	#4	4	3'-9"	10
Z8	4	#4	4	3'-1"	8

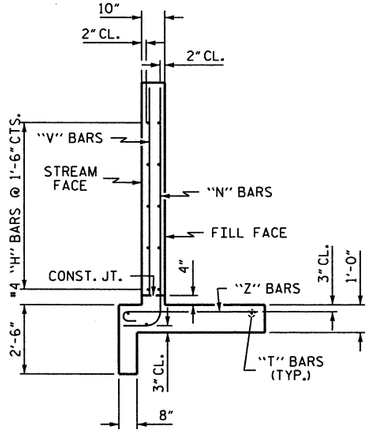
REINFORCING STEEL FOR 2 WINGS	660 LBS
CLASS A CONCRETE	
2 WINGS	9.9 CY
1 HEADWALL	0.6 CY
1 END CURTAIN WALLS	0.6 CY
TOTAL	11.1 CY



ELEVATION W1



ELEVATION W2



TYPICAL WING SECTION

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 2+22.93 -SPCY8-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT #3
SINGLE 10'X7' RCBC
INLET END WINGS

H = 7'-0" SLOPE = 2:1

120° SKEW

ASSEMBLED BY : A. SORSENGINH	DATE : 6/7/16
CHECKED BY : T. H. FANG	DATE : 6/15/16
DRAWN BY : CCJ 11/99	
CHECKED BY : RWW 03/00	

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

DocuSigned by: Ting Fang E72068400977435... 8/16/2016

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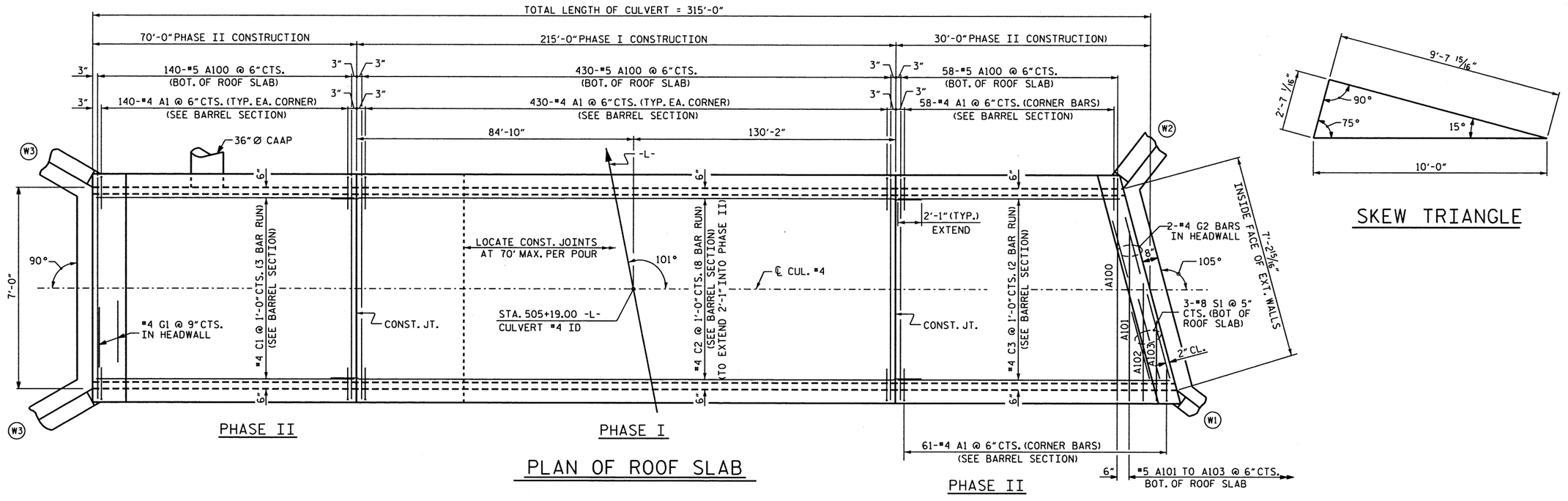
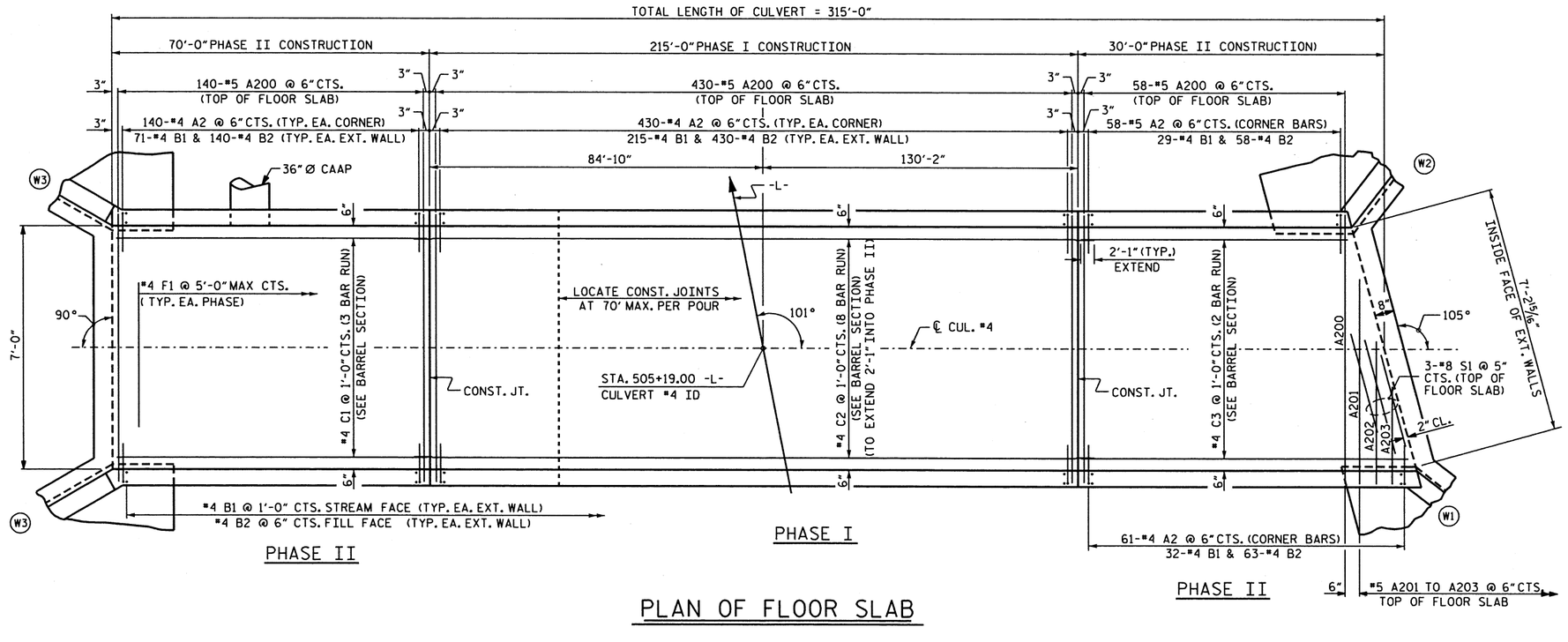
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-26
1			3			TOTAL SHEETS
2			4			34

CUL #3 STD. NO. CW6007



PLAN OF ROOF SLAB

SKEW TRIANGLE



PLAN OF FLOOR SLAB

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

DocuSigned by: Ting Fang E72086409977435... 8/16/2016

PROJECT NO. U-2524D

GUILFORD COUNTY

STATION: 505+19.00 -L-

SHEET 3 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT #4 SINGLE 7 FT. X 8 FT. CONCRETE BOX CULVERT 101° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-30
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : REZA KOUCHEKI DATE : 4/29/16
CHECKED BY : T. H. FANG DATE : 5/15/16
DESIGN ENGINEER OF RECORD: REZA KOUCHEKI DATE : 1/29/16

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tfang

CUL #4